SPECIFICATIONS

(FOR CONSTRUCTION CONTRACT)

SOLICITATION NO. W9128F-04-R-0014

BUCKLEY AFB, Colorado

VOLUME 1 OF 2
DIVISION 00 – DIVISION 09

SEPTEMBER 2004

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

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SPECIFICATIONS FOR CONTSTRUCTION OF

CHILD DEVELOPMENT CENTER
CRWU 04-3007

BUCKLEY AFB, COLORADO

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	W9128F-04-R-0014	☐ SEALED BID (IFB) ☒ NEGOTIATED (RFP)	15 SEP 2004	1 OF 5

IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO.	6. PROJECT NO.

7. ISSUED BY CODE CT

U S ARMY ENGINEER DISTRICT, OMAHA
106 South 15th Street
Omaha, Nebraska 68102-1618

8. ADDRESS OFFER TO

U.S.ARMY CORPS OF ENGINEERS, OMAHA
Attn: CONTRACTING DIVISION (CENWO-CT)
106 South 15th Street
Omaha, Nebraska 68102-1618

9. FOR INFORMATION CALL: ▶	A. NAME	B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS)
	See SECTION 00100, Para. 15	See SECTION 00100, Para. 15

SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS (Title, identifying no., date):

The Offeror hereby agrees to do all the work described in these documents entitled:

CHILD DEVELOPMENT CENTER
CRWU 04-3007
BUCKLEY AFB, COLORADO

RETURN WITH PROPOSAL: INFORMATION REQUIRED BY SECTION 00110; SECTION 00010 (SF1442); AND SECTION 00600

OTHER BONDING INFORMATION: SEE CONTRACT CLAUSES CLAUSE "PERFORMANCE AND PAYMENT BONDS".

*-SEE SECTION 00800, PARA.1 AND SECTION 00110:PROPOSAL SUBMISSION REQUIREMENTS, INSTRUCTIONS AND EVALUATION (**Contractor to Propose Number of Calendar days and insert in Item 11 below**.)
**-SEE SECTION 00110:PROPOSAL SUBMISSION REQUIREMENTS, INSTRUCTIONS AND EVALUATION (For number of Proposal Copies)

11. The Contractor shall begin performance within 10 calendar days and complete it within * calendar days after receiving

☐ award, ☒ notice to proceed. This performance period is ☒ mandatory, ☐ negotiable. (See _____ .)

12A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? (If "YES," indicate within how many calendar days after award in Item 12B.)	12B. CALENDAR DAYS
☒ YES ☐ NO	10

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and ** copies to perform the work required are due at the place specified in Item 8 by 1400 (hour) local time 27 OCT 2004 (date). If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee ☐ is, ☒ is not required.

C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.

D. Offers providing less than 60 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

14. NAME AND ADDRESS OF OFFEROR (Include ZIP Code)	15. TELEPHONE NO. (Include area code)
DUNS Number:	16. REMITTANCE ADDRESS (Include only if different than Item 14)
CODE FACILITY CODE	

17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of this solicitation, if this offer is accepted by the Government in writing within 60 calendar days after the date offers are due. (Insert any number equal to or greater than the minimum requirement stated in Item 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.)

AMOUNTS ▶ SEE ATTACHED PRICING SCHEDULE

Contractor's Fax No._____ CAGE CODE _____

Contractor's E-Mail address_____

18. The offeror agrees to furnish any required performance and payment bonds.

19. ACKNOWLEDGMENT OF AMENDMENTS

(The offeror acknowledges receipt of amendments to the solicitation - give number and date of each)

AMENDMENT NO.										
DATE										

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)	20B. SIGNATURE	20C. OFFER DATE

AWARD (To be completed by Government)

21. ITEMS ACCEPTED:

22. AMOUNT	23. ACCOUNTING AND APPROPRIATION DATA

24. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified) ▶	ITEM 26	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO ☐ 10 U.S.C. 2304(c) ( ) ☐ 41 U.S.C. 253(c) ( )

26. ADMINISTERED BY CODE	27. PAYMENT WILL BE MADE BY
U.S. Army Engineer District, Omaha 106 South 15th Street Omaha, Nebraska 68102-1618	USAED Omaha c/o USACE Finance Center 5722 Integrity Drive Millington, TN 38054-5005

CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

☐ 28. NEGOTIATED AGREEMENT (contractor is required to sign this document and return_____ copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all work, requisitions identified on this form and any continuation sheets for the consideration stated in this contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, representations, certifications, and specifications incorporated by reference in or attached to this contract.

☐ 29. AWARD (Contractor is not required to sign this document.) Your offer on this solicitation, is hereby accepted as to the items listed. This award consummates the contract, which consists of (a) the Government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.

30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN (Type or print)		31A. NAME OF CONTRACTING OFFICER (Type or print)	
30B. SIGNATURE	30C. DATE	31B. UNITED STATES OF AMERICA BY	31C. AWARD DATE

PRICING SCHEDULE

PRICING SCHEDULE				
ITEM NO.	**DESCRIPTION**	**QUANTITY**	**UNIT**	**AMOUNT**
BASIC ITEMS				
0001	Entire work complete for Child Development Center, excluding Option items listed below.	Job	L.S.	$_____
OPTION ITEMS				
O-0001	Additional amount to add one toddler care module and one multipurpose room, complete, excluding Option O-0007 below. For Floor Plan of this option, See Sheet A1.05 of the drawings.	Job	L.S.	$_____
O-0002	Additional amount to add one pre-toddler care module, complete, excluding Option O-0008 below. For Floor Plan of this option, See Sheet A1.05 of the drawings.	Job	L.S.	$_____
O-0003	All work complete to add new 104-space parking lot located south of A-Basin Avenue as shown on the drawings. For Site Plan for this Option, See Sheet C9.20 of the drawings.	Job	L.S.	$_____
O-0004	Additional amount to add enhanced landscaping features, complete, as shown on the drawings. See Sheet L1.02 of the drawings for layout of this option.	Job	L.S.	$_____

O-0005	All work complete to furnish and install mobile Kitchen equipment as identified on Sheet IE.01 of the drawings.	Job	L.S.	$_____
O-0006	All work complete to furnish and install furniture package, as specified and shown on Sheet I1.01, for Basic Item 0001, excluding Options O-0007 and O-0007 below.	Job	L.S.	$_____
O-0007	All work complete to furnish and install furniture package, as specified and shown on Sheet I1.02 of the drawings, for Option O-0001 above.	Job	L.S.	$_____
O-0008	All work complete to furnish and install furniture package, as specified and shown on Sheet I1.02 of the drawings, for Option O-0002 above.	Job	L.S.	$_____
O-0009	All work complete to furnish and install playground equipment, as specified and shown on Sheet L1.05 of the drawings, for Pre-Toddler Playground, Pre-School Playground and Toddler playground.	Job	L.S.	$_____
O-0010	All work complete to furnish and install fixed Kitchen equipment as identified on Sheet IE.01 of the drawings.	Job	L.S.	$_____

O-0011	Additional cost to replace tile playground safety surfaces with poured synthetic surfaces.	Job	L.S.	$_____
TOTAL AMOUNT (BASIC PLUS ALL OPTIONS) $_____				

NOTES:

1. See Section 00100, INSTRUCTIONS, CONDITIONS AND NOTICES OFFERORS, paragraph EVALUATION OF OPTIONS for evaluation of pricing items and options. The Government reserves the right to exercise Options 1 and 2 within 15 calendar days of Notice to Proceed. The Government reserves the right to exercise Options 3, 4, 9, 10 and 11 within 60 calendar days of Notice to Proceed. The Government reserves the right to exercise Options 5, 6, 7 and 8 within 150 calendar days of Notice to Proceed. Option 7 will not be exercised without exercising Option 1. Option 8 will not be exercised without exercising Option 2. Drawing Sheet References provided above for Options may not be the only drawing sheets where these Option items are shown.

2. Prices must be entered for all line items on the Pricing Schedule. Total amount prices submitted without prices for individual line items will not be evaluated. Additions will be subject to verification by the Government. In case of variation between the lump-sum prices and the total amount, the lump-sum prices will be considered the price. In case of variation between the unit prices and the extensions, the unit prices will be considered the amount proposed.

3. Modification to the Pricing Schedule items, basic or options should state the application of the adjustment to each respective lump sum (LS) price affected. If the modification is no so apportioned, the single adjustment will apply to Basic Item No. 1.

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SECTION 00100

INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS
(July 2000, Revised May 2004)

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SECTION 00100

INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS

1 RESERVED

2 SOLICITATION RESTRICTIONS.

2.1 GENERAL CONTRACTOR.

THIS SOLICITATION IS UNRESTRICTED, OPEN TO BOTH LARGE AND SMALL BUSINESS PARTICIPATION.

2.2 ESTIMATED CONSTRUCTION COST.

The estimated construction cost of this project is between $5,000,000 and $7,500,000.

3 (FAR 52.217-5) EVALUATION OF OPTIONS (JUL 1990).

Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interests, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirement. Evaluation of options will not obligate the Government to exercise the option(s).

4 (FAR 52.211-2) AVAILABILITY OF SPECIFICATIONS LISTED IN THE DOD INDEX OF SPECIFICATIONS AND STANDARDS (DODISS) AND DESCRIPTIONS LISTED IN THE ACQUISITION MANAGEMENT SYSTEMS AND DATA REQUIREMENTS CONTROL LIST, DOD 5010.12-L (DEC 2003)

Copies of specifications, standards, and data item descriptions cited in this solicitation may be obtained—

(a) From the ASSIST database via the Internet at http://assist.dla.mil; or

(b) By submitting a request to the—

Department of Defense Single Stock Point (DoDSSP)
Building 4, Section D
700 Robbins Avenue
Philadelphia, PA 19111-5094
Telephone (215) 697-2179
Facsimile (215) 697-1462.

(End of provision)

5 (FAR 52.215-1) INSTRUCTIONS TO OFFERORS--COMPETITIVE ACQUISITION (JAN 2004)

(a) *Definitions*. As used in this provision—

“Discussions” are negotiations that occur after establishment of the competitive range that may, at the Contracting Officer’s discretion, result

in the offeror being allowed to revise its proposal.

"In writing," "writing," or "written" means any worded or numbered expression that can be read, reproduced, and later communicated, and includes electronically transmitted and stored information.

"Proposal modification" is a change made to a proposal before the solicitation's closing date and time, or made in response to an amendment, or made to correct a mistake at any time before award.

"Proposal revision" is a change to a proposal made after the solicitation closing date, at the request of or as allowed by a Contracting Officer as the result of negotiations.

"Time," if stated as a number of days, is calculated using calendar days, unless otherwise specified, and will include Saturdays, Sundays, and legal holidays. However, if the last day falls on a Saturday, Sunday, or legal holiday, then the period shall include the next working day.

(b) *Amendments to solicitations*. If this solicitation is amended, all terms and conditions that are not amended remain unchanged. Offerors shall acknowledge receipt of any amendment to this solicitation by the date and time specified in the amendment(s).

(c) *Submission, modification, revision, and withdrawal of proposals*. (1) Unless other methods (*e.g.*, electronic commerce or facsimile) are permitted in the solicitation, proposals and modifications to proposals shall be submitted in paper media in sealed envelopes or packages (i) addressed to the office specified in the solicitation, and (ii) showing the time and date specified for receipt, the solicitation number, and the name and address of the offeror. Offerors using commercial carriers should ensure that the proposal is marked on the outermost wrapper with the information in paragraphs (c)(1)(i) and (c)(1)(ii) of this provision.

(2) The first page of the proposal must show—

(i) The solicitation number;

(ii) The name, address, and telephone and facsimile numbers of the offeror (and electronic address if available);

(iii) A statement specifying the extent of agreement with all terms, conditions, and provisions included in the solicitation and agreement to furnish any or all items upon which prices are offered at the price set opposite each item;

(iv) Names, titles, and telephone and facsimile numbers (and electronic addresses if available) of persons authorized to negotiate on the offeror's behalf with the Government in connection with this solicitation; and

(v) Name, title, and signature of person authorized to sign the proposal. Proposals signed by an agent shall be accompanied by evidence of that agent's authority, unless that evidence has been previously furnished to the issuing office.

(3) *Submission, modification, revision, and withdrawal of proposals*.

(i) Offerors are responsible for submitting proposals, and any modifications or revisions, so as to reach the Government office designated in the solicitation by the time specified in the solicitation. If no time is specified in the solicitation, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that proposal or revision is due.

(ii)(A) Any proposal, modification, or revision received at the Government office designated in the solicitation after the exact time specified for receipt of offers is "late" and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late offer would not unduly delay the acquisition; and—

(*1*) If it was transmitted through an electronic

commerce method authorized by the solicitation, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of proposals; or

(*2*) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of offers and was under the Government's control prior to the time set for receipt of offers; or

(*3*) It is the only proposal received.

(B) However, a late modification of an otherwise successful proposal that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(iii) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(iv) If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the office designated for receipt of proposals by the exact time specified in the solicitation, and urgent Government requirements preclude amendment of the solicitation, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(v) Proposals may be withdrawn by written notice received at any time before award. Oral proposals in response to oral solicitations may be withdrawn orally. If the solicitation authorizes facsimile proposals, proposals may be withdrawn via facsimile received at any time before award, subject to the conditions specified in the provision at 52.215-5, Facsimile Proposals. Proposals may be withdrawn in person by an offeror or an authorized representative, if the identity of the person requesting withdrawal is established and the person signs a receipt for the proposal before award.

(4) Unless otherwise specified in the solicitation, the offeror may propose to provide any item or combination of items.

(5) Offerors shall submit proposals in response to this solicitation in English, unless otherwise permitted by the solicitation, and in U.S. dollars, unless the provision at FAR 52.225-17, Evaluation of Foreign Currency Offers, is included in the solicitation.

(6) Offerors may submit modifications to their proposals at any time before the solicitation closing date and time, and may submit modifications in response to an amendment, or to correct a mistake at any time before award.

(7) Offerors may submit revised proposals only if requested or allowed by the Contracting Officer.

(8) Proposals may be withdrawn at any time before award. Withdrawals are effective upon receipt of notice by the Contracting Officer.

(d) *Offer expiration date*. Proposals in response to this solicitation will be valid for the number of days specified on the solicitation cover sheet (unless a different period is proposed by the offeror).

(e) *Restriction on disclosure and use of data*. Offerors that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall—

(1) Mark the title page with the following legend:

This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed—in whole or in part—for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this offeror as a result of—or in connection with—the

submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets [*insert numbers or other identification of sheets*]; and

(2) Mark each sheet of data it wishes to restrict with the following legend:

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

(f) *Contract award*. (1) The Government intends to award a contract or contracts resulting from this solicitation to the responsible offeror(s) whose proposal(s) represents the best value after evaluation in accordance with the factors and subfactors in the solicitation.

(2) The Government may reject any or all proposals if such action is in the Government’s interest.

(3) The Government may waive informalities and minor irregularities in proposals received.

(4) The Government intends to evaluate proposals and award a contract without discussions with offerors (except clarifications as described in FAR 15.306(a)). Therefore, the offeror’s initial proposal should contain the offeror’s best terms from a cost or price and technical standpoint. The Government reserves the right to conduct discussions if the Contracting Officer later determines them to be necessary. If the Contracting Officer determines that the number of proposals that would otherwise be in the competitive range exceeds the number at which an efficient competition can be conducted, the Contracting Officer may limit the number of proposals in the competitive range to the greatest number that will permit an efficient competition among the most highly rated proposals.

(5) The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit cost or prices offered, unless the offeror specifies otherwise in the proposal.

(6) The Government reserves the right to make multiple awards if, after considering the additional administrative costs, it is in the Government’s best interest to do so.

(7) Exchanges with offerors after receipt of a proposal do not constitute a rejection or counteroffer by the Government.

(8) The Government may determine that a proposal is unacceptable if the prices proposed are materially unbalanced between line items or subline items. Unbalanced pricing exists when, despite an acceptable total evaluated price, the price of one or more contract line items is significantly overstated or understated as indicated by the application of cost or price analysis techniques. A proposal may be rejected if the Contracting Officer determines that the lack of balance poses an unacceptable risk to the Government.

(9) If a cost realism analysis is performed, cost realism may be considered by the source selection authority in evaluating performance or schedule risk.

(10) A written award or acceptance of proposal mailed or otherwise furnished to the successful offeror within the time specified in the proposal shall result in a binding contract without further action by either party.

(11) If a post-award debriefing is given to requesting offerors, the Government shall disclose the following information, if applicable:

(i) The agency’s evaluation of the significant weak or deficient factors in the debriefed offeror’s offer.

(ii) The overall evaluated cost or price and technical rating of the successful and the debriefed offeror and past performance information on the debriefed offeror.

(iii) The overall ranking of all offerors, when any ranking was developed by the agency during source selection.

(iv) A summary of the rationale for award.

(v) For acquisitions of commercial items, the make and model of the item to be delivered by the successful offeror.

(vi) Reasonable responses to relevant questions posed by the debriefed offeror as to whether source-selection procedures set forth in the solicitation, applicable regulations, and other applicable authorities were followed by the agency.

(End of provision)

6 CHANGES PRIOR TO RECEIVING OFFERS

The right is reserved, as the interest of the Government may require, to revise the specifications and/or solicitation drawings prior to the date set for receiving offers. Such revisions will be announced by an amendment or amendments to this solicitation. **It shall be the responsibility of the prospective offeror, subcontractor or supplier to obtain copies of amendments from the website listed in paragraph: PLAN HOLDER'S LIST below**. The Government may (but not required) send an amendment notification to let prospective offerors know that an amendment has been issued.

7 (FAR 52.216-1) TYPE OF CONTRACT (APR 1984).

The Government contemplates award of a firm fixed price contract resulting from this solicitation.

(End of provision)

8 DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER (Local Provision)

(a) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation "DUNS" followed by the DUNS number that identifies the offeror's name and address exactly as stated in the offer. The DUNS number is a nine-digit number assigned by Dun and Bradstreet Information Services.

(b) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one. A DUNS number will be provided immediately by telephone at no charge to the offeror. For information on obtaining a DUNS number, the offeror, if located within the United States, should call Dun and Bradstreet at 1-800-333-0505. The offeror should be prepared to provide the following information:

(1) Company name.

(2) Company address.

(3) Company telephone number.

(4) Line of business.

(5) Chief executive officer/key manager.

(6) Date the company was started.

(7) Number of people employed by the company.

(8) Company affiliation.

(c) Offerors located outside the United States may obtain the location and phone number of the local Dun and Bradstreet Information Services office from the Internet home page at http://www.customerservice@dnb.com. If an offeror is unable to locate a local service center, it may send an e-mail to Dun and Bradstreet at globalinfo@mail.dnb.com.

(End of provision)

9 SMALL BUSINESS SIZE STANDARD.

The small business size standard is gross annual receipts for its preceding 3 fiscal years did not exceed $28.5 million.

10 NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS).

In accordance with Sector 23 of the NAICS Manual, the work in this solicitation is assigned classification code 236220.

11 RESERVED

12 (FAR 52.236-28) PREPARATION OF PROPOSALS—CONSTRUCTION (OCT 1997)

(a) Proposals must be (1) submitted on the forms furnished by the Government or on copies of those forms; and (2) manually signed. The person signing a proposal must initial each erasure or change appearing on any proposal form.

(b) The proposal form may require offerors to submit proposed prices for one or more items on various bases, including—

(1) Lump sum price;
(2) Alternate prices;
(3) Units of construction; or
(4) Any combination of paragraphs (b)(1) through (b)(3) of this provision.

(c) If the solicitation requires submission of a proposal on all items, failure to do so may result in the proposal being rejected without further consideration. If a proposal on all items is not required, offerors should insert the words "no proposal" in the space provided for any item on which no price is submitted.

(d) Alternate proposals will not be considered unless this solicitation authorizes their submission.

(End of provision)

13 (FAR 52.233-2) SERVICE OF PROTEST (AUG 1996).

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgement of receipt from District Counsel, 106 South 15th Street, Omaha, Nebraska 68102-1618.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

14 (FAR 52.236-27) SITE VISIT (CONSTRUCTION) (FEB 1995).

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) A site visit is scheduled for 6 October 2004 at the proposed Construction Site at 1:30 p.m. (local time). All Contractors must contact the Corps of Engineers Buckley Resident Office no later than 1 October 2004 so that arrangements can be made with the Security Police to allow entry of the Contractors onto the Base. The Points of Contact at the Resident Office are Lavon Busby or Jennifer McQueen, telephone (303) 367-0335 or (303) 367-0316. The fax number at the Resident Office is (303) 367-0357. Contractors must provide a fax with the following information to the Resident Office for all visitors attending:

1) Name of Contractor or Firm Represented
2) Visitor Name
3) Visitor Social Security Number
4) Visitor Date of Birth and Place of Birth
5) Visitor Drivers License Number
6) Visitor Proof of Citizenship

Provide a phone number on each fax so that information, which may be illegible or requires additional clarification, can be verified, if necessary. **NOTE: THIS INFORMATION MAY NOT BE TRANSMITTED VERBALLY ONLY A FAX CONTAINING THE INFORMATION IS ACCEPTABLE.** The information will be furnished to the Security Police at Buckleys Sixth Avenue Base Gate (This is the north gate of Buckley AFB it is located at 6th Avenue and Aspen Drive). On the day of the Site Visit, Contractors should enter the base at the Sixth Avenue Gate and present photo IDs to the Guards, then proceed to the Pass & ID Building just inside the gate to obtain a Vehicle Pass. A valid drivers license, current vehicle registration, and proof of insurance will be required for the vehicle pass. Note that the check-in procedure and issuance of a vehicle pass normally takes approximately 60 minutes for the number of people anticipated. Once a vehicle pass is issued, Contractors should proceed to the project site (see Sheet C1.00 of the solicitation for a map) where a Representative of the Corps of Engineers will meet the contractors to show them the site and the pertinent features. The site visit will begin promptly at 1:30. Because of Security issues and badge requirements, please plan to arrive early. Questions regarding the site visit should be directed to the Resident Office

at the number listed above with a copy of the questions provided to U.S. Army Engineer District, Omaha, Contracting Division, CENWO-CT-M (Famane Brown), 106 S 15th Street, Omaha NE 68102-1618. Access to Buckley AFB will be denied to anyone failing to comply with the requirements stated above.

15 OFFEROR'S QUESTIONS AND COMMENTS.

Questions and/or comments relative to these documents should be submitted via e-mail or mailed to: U.S. Army Corps of Engineers, Omaha District, ATTN: CENWO-CT-M 106 South 15th Street, Omaha, NE 68102-1618. Comments should reach this office no later than 20 calendar days prior to the date set for receiving of proposals, if feasible, in order that changes, if needed, may be added by amendment. E-mail addresses, FAX numbers, items for question and points of contact are listed below. Phone calls with questions should be made between 8:30 a.m. and 3:30 p.m. (Central Standard Time) Monday through Friday.

Note: A courtesy copy of all questions shall be sent to the Contract Specialist (Contractual Matters Point of Contact), the Program Manager and the Specifications Section (Technical Contents Points of Contact), except for Small Business questions. Small Business questions shall go to the Small Business Matters point of contact.

Items for Question	Points of Contact/ Phone numbers/ FAX Numbers	E-mail Addresses
Contractual Matters: Ordering CD-Rom of the plans and specifications (limit One per firm)/ amendments**	Famane Brown 402-221-4265 (phone)	famane.c.brown@usace.army.mil
Planholder's List	See paragraph: PLAN HOLDER'S LIST, below.	
Small Business Matters	Hubert Carter 402-221-4110 (phone)	hubert.j.carter@usace.army.mil
Technical Contents Of Proposal Documents	Larry Sand 402-221-4595 (phone) 402-221-4828 (fax)	larry.d.sand@usace.army.mil
	Or	
	Specifications Section Doug Larsen 402-221-4547 402-221-3842	douglas.r.larsen@usace.army.mil
Site Inspection	See Paragraph: SITE INSPECTION, above	

**** - The Government may elect to send a notification that an amendment has**

been posted to the Government's web address, but is not required to. It shall be the Contractor's, Subcontractor's and Supplier's responsibility to check the Government's web address for amendments.

15.1 PLAN HOLDER'S LIST.

The CD-Rom will provide a list of plan holders that have registered at the time the CD-Rom was created. It is offeror's responsibility to check for any updates to the plan holder's list, which is available at the following web address:

http://ebs-nwo.wes.army.mil/

16 GENERAL DESCRIPTION OF WORK.

Scope of project includes all work required to construct the Child Development Center including associated site work located at Buckley AFB, Colorado. Work shall be in accordance with plans and specifications issued with this solicitation.

17 PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS.

See Section 00110 PROPOSAL SUBMISSION REQUIREMENTS, INSTRUCTIONS AND EVALUATION.

18 SOURCE SELECTION BOARD (SSB).

The Contracting Officer has established a Source Selection Board to conduct an evaluation of each proposal received in response to this Solicitation. The evaluation will be based exclusively on the merits and content of the proposal and any subsequent discussion required. The identities of the SSB personnel are confidential, and any attempt by the proposers to contact these individuals is prohibited.

19 PROPOSAL EVALUATION AND CONTRACT AWARD

See Section 00110 PROPOSAL SUBMISSION REQUIREMENTS, INSTRUCTIONS AND EVALUATION.

20 COLORADO SALES AND USE TAX.

Specific exemption from the Colorado Sales and Use Taxes will be granted by the Colorado Tax authorities with respect to all materials used by a prime Contractor or subcontractor and which are built into structures furnished under contract to a Government agency. The Colorado Sales and Use Taxes shall be excluded from the bid prices. Exemption certificates are available to both Contractors and subcontractors provided personal application is made therefor to the Department of Revenue, State of Colorado, State Capitol Annex, Denver, Colorado. The Contractor or subcontractor will be required to submit the date of the contract, the amount of the contract, and the proposed date for completion of the contract. Telephone: (303) 534-1208 (General Information).

21 (FAR 52.232-18) AVAILABILITY OF FUNDS (APR 1984).

Funds are not presently available for this contract. The Government's obligation under this contract is contingent upon the availability of appropriated funds from which payment for contract purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the Contracting Officer for this contract and until the Contractor receives notice of such availability, to be confirmed in writing by the Contracting Officer. (FAR 52.232-18)

REQUIRED CENTRAL CONTRACTOR REGISTRATION (CCR)

Register Now: Don't wait until you submit an offer on a solicitation. You must be registered to receive the contract award. It can often take 30 days for CCR to process your registration information.

Register One of Three Ways:

Internet: http://www.ccr.gov

Value Added Network (VAN) for EDI users: Contact your VAN for information. If you need to find a VAN look at http://www.acq.osd.mil/ec/ecip/van_list.htm

FAX or Mail: Call (888)227-2423 or (616)961-4725 to receive a registration package. FAX or mail the completed information to the CCR Assistance Center. It can take up to 30 days to process a faxed or mailed package.

CCR Assistance Center
74 Washington Street North, Suite 7
Battle Creek, MI 49017-3084
FAX: (616)961-7243

SECTION 00110
CHILD DEVELOPMENT CENTER, BUCKLEY AFB, CO
PROPOSAL SUBMISSION REQUIREMENTS, INSTRUCTIONS, AND EVALUATION

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SECTION 00110

CHILD DEVELOPMENT CENTER, BUCKLEY AFB, CO

PROPOSAL SUBMISSION REQUIREMENTS, INSTRUCTIONS, AND EVALUATION

1. WHO MAY SUBMIT.

This solicitation is **UNRESTRICTED, 100% Designed** and open to both large and small business participation.

The magnitude of construction for this project is between $5 and $10 Million dollars.

The North American Industry Classification System code for this project is 236220, with a size standard for small business of $28.5 Million dollars gross annual receipts over 3 years.

In order to effectively and equitably evaluate all proposals, the Contracting Officer must receive information sufficiently detailed to clearly indicate the proposal requirements. There will be no public opening. All proposals submitted will become, upon receipt, the property of the U.S. Government and will not be returned. After evaluation of proposals, any extra copies of the proposals deemed unnecessary by the government will be destroyed as deemed appropriate. The original will be retained for the official contract file.

2. EVALUATION OF PROPOSALS.

a. All proposals and documentation which have been properly submitted will be evaluated. Proposals received will be evaluated on the basis of the factors stated in the solicitation to select the responsible offeror whose proposal is most advantageous and offers the best value to the Government. Proposals must be clear, concise, and must comply with the instructions in the solicitation.

b. The most highly rated proposals will make up the competitive range. (See FAR 15.306(c)(1)).

c. Source selection will be conducted using the Tradeoff Process, FAR 15.101-1. Tabs 1 through 6 will be rated using an adjectival methodology with a narrative assessment and Tab 7 (Price) will be evaluated for best value after consensus rating of Tabs 1-6. Proposal evaluation is an assessment of the proposal and the offeror's ability to perform the resultant contract successfully. Proposals will be evaluated to determine ratings supported by narratives, and to identify strengths, weaknesses, and deficiencies of the proposed approach in each proposal.

d. Evaluation Definitions.

(1) Strength. A substantive aspect, attribute, or specific item in the proposal that exceeds the solicitation requirements and enhances the probability of successful contract performance.

(2) Proposal modification is a change made to a proposal before the solicitation closing date and time, or made in response to an amendment, or made to correct a mistake at any time before award.

(3) Proposal revision is a change to a proposal made after the solicitation closing date, at the request of or as allowed by the contracting officer, as a result of discussions/negotiations.

(4) Weakness. A flaw in the proposal that increases the risk of unsuccessful contract performance. A significant weakness in the proposal is a flaw that appreciably increases the risk of unsuccessful contract performance.

(5) Deficiency. A material failure of a proposal to meet a Government requirement or a combination of significant weaknesses in a proposal that increases the risk of unsuccessful contract performance to an unacceptable level.

(6) Clarification. Clarifications are limited exchanges between the Government and offerors that may occur when award without discussions is contemplated. If award without discussions is anticipated, offerors may be given the opportunity to clarify certain aspects of their proposals or to resolve minor or clerical errors without material changes to their proposal. The purpose of clarifications is the elimination of minor irregularities, informalities or apparent clerical mistakes in the technical proposal. Clarifications do not provide an offeror the opportunity to revise or modify its proposal, except for correction of apparent clerical mistakes that would ultimately result in a revision. All clarifications are conducted through the Contracting Officer.

(7) Communications. Communications are exchanges between the Government and offerors after receipt of proposals, leading to establishment of the competitive range.

(8) Discussions. Discussions are negotiations conducted in a competitive acquisition and take place after establishment of the competitive range. Discussions are tailored to each offeror's proposal, and shall be conducted by the Contracting Officer with each offeror within the competitive range.

(9) Rating. The application of a scale of adjectives used in conjunction with narrative, to denote the degree to which the proposal has met the standard for a non-cost factor. For purposes of this solicitation, ratings will consist of words (adjectival method) used in conjunction with narratives. If information in an Offeror's proposal is evaluated as not meeting a minimum requirement, this fact must be included in the rating and narrative. The following ratings will be used to evaluate Tabs 1 through 6:

Exceptional. Exceeds requirements of the RFP, provides all required information

stated in Paragraph 6 of this Section, and is expressed in a manner indicating maximum benefit to the government. The submitted technical portion of the proposal has no significant weakness.

Above Average. Exceeds requirements of the RFP, provides all required information stated in Paragraph 6 of this Section, and is expressed in a manner indicating significant benefit to the government. The submitted proposal has only minor weaknesses that have no impact on the proposal as a whole and do not require correction.

Average. Meets requirements of the RFP as required in Paragraph 6 of this Section, and indicates benefits to the government. Any weaknesses noted have only a minor impact on the proposal and are easily correctable.

Marginal. Barely meets solicitation requirements of the factor or sub-factor requirements of Paragraph 6 of this Section. The Government may still receive benefit from the proposal submitted. Any deficiencies noted are correctable without major revision of the proposal.

Unacceptable. Fails to meet one or more of the factor or sub-factor requirements of the solicitation, Paragraph 6 of this Section. The Government would not receive benefit from the proposal submitted. The deficiencies noted are uncorrectable without a major revision of the proposal

For Tab 2, Past Performance Construction and the past performance portion of Tab 3, Qualifications of Construction Personnel/Mechanical & Electrical Sub-Contractors, a **neutral rating** will be awarded when no past performance records are available. The Federal Acquisition Regulation (FAR) 15.305(a)(2)(iv) states, “In the case of an offeror without a record of relevant past performance or for whom information on past performance is not available, the offeror may not be evaluated either favorably or unfavorably on past performance." Therefore, where a proposer fails to provide past performance information and where it is not available from other sources, past performance shall not be evaluated. The proposal shall be evaluated just as if “past performance” were not an evaluation factor.

3. SIZE OF PRINTED MATTER SUBMISSIONS.

All written portions shall be in 8-1/2" x 11" format.

4. WHERE TO SUBMIT.

Offerors shall submit their proposal packages to the USACE Contracting Activity at the address shown in Block 8 of Standard Form 1442.

5. SUBMISSION DEADLINE.

Submittals must be received in the Omaha District Offices no later than the date and time found on the Standard Form SF 1442, Page 00010-1, Item 13A. At this time, it will be announced that receipt of proposals is closed. Official time will be established by the clock located in the area where proposals are received. Any proposal received after this time will be considered a late proposal and will not be evaluated unless FAR requirements of 52.215-1 have been met concerning late bids/proposals.

For those offerors who will hand-carry their proposals to the Omaha District Office, the following provisions apply. Due to heightened security at Government installations, those offerors who have their proposals hand-delivered shall contact Famane Brown, Contract Specialist at (402) 221-3116 or (402) 221-4100 prior to delivering their proposal to the U.S. Army Corps of Engineers, 106 South 15th Street, Omaha, NE 68102-1618.

On the date specified and for thirty (30) minutes prior to the time specified on the Standard Form (SF) 1442, page 00010-1, Item 13A, a Contracting Representative will be in the lobby to accept proposals.

6. PROPOSAL REQUIREMENTS, SUBMISSION FORMAT, AND EVALUATION.

Offerors shall submit the **original and five (5) copies** of their proposal, each consisting of a 3-ring binder with Tabs (dividers) separating the sections (Tabs 1 through 6). Information contained in Tab 7 shall be a separate binder. Only one original (no additional copies) of the Tab 7 binder shall be submitted. Tabs 1 through 7 shall contain the following information:

Tab 1 – Construction Experience

Tab 2 – Past Performance, Construction

Tab 3 – Qualifications of Construction Personnel/Mechanical & Electrical Sub-Contractors

Tab 4 – Project Management Plan (PMP)

Tab 5 - Schedule

Tab 6 - Utilization of Small Business Concerns

Tab 7 – Price

All proposals shall contain all information stated below. Proposal clarity, organization (as defined in this solicitation) and cross referencing are mandatory. Submitted material incorporated by

reference will not be evaluated. The offeror should submit in the proposal the requested information specified below. Note that the evaluation factors listed above, other than Price, are listed in descending order of importance and when combined, are approximately equal in importance to Tab 7, Price. An unacceptable evaluation rating for any tab, or combination of unacceptable ratings of different tabs, may cause the proposal to be evaluated overall as unacceptable. Price (Tab 7) will be evaluated in accordance the requirements listed in paragraph: TAB 7 - Price, Paragraph 6.7 below.

6.1 TAB 1 – Construction Experience.

6.1.1 Submission Requirements. In this tab, the offeror should submit up to six (6) examples of construction projects which best illustrate his experience on projects of a similar type as this project. Each project summary should consist of a one or two page narrative of the example project, discussing the project and providing specifics as noted herein. No more than 6 projects may be submitted. If more than six projects are submitted, only the first six listed in the proposal will be evaluated. Each project cited should have a construction dollar value greater than $3 million and have been constructed within the past five (5) years. Indefinite-Delivery, Indefinite Quantity (IDIQ) Contracts, where numerous Task Orders are summed to meet the minimum construction dollar value identified herein, are not acceptable. Only those projects for which the offeror was the prime contractor should be submitted, and all projects submitted should have been completed by the regional office that will be performing the work on this Base. The summaries should include project examples that are similar to the Child Development Center (CDC) Project. Similar project types are considered child care facilities. Other project types that may be considered similar are buildings of a similar type of construction (i.e. brick or stucco-faced steel stud framing). Child care project examples will be evaluated more favorably than other types of facilities. The government preference is that project examples submitted be of completed projects (i.e. construction complete). Projects still under construction will be evaluated, though less favorably than completed projects. Those offers that include military construction projects of a similar type as the CDC Project will be rated more favorably than those without such construction similarity. Each project summary should include: a description of the project; location; construction contract award amount and final construction cost; and the original contract finish date and actual finish date (if finished). Narratives of each project should include a brief overview of each project and its relevance to this project. All summaries should also contain the name, address, telephone and fax number of a representative of the customer and an alternate individual not affiliated with your firm and familiar with your firm's experience on the project that can verify the experience cited. If you do not want the data submitted disclosed by the Government, follow the procedure specified in Section 00100 INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS paragraph 3 (e): RESTRICTION ON DISCLOSURE AND USE OF DATA.

6.1.2 Evaluation. The Construction Contractor's experience in construction of facilities similar to this project will be evaluated. Previous experience, cited by project narratives (project summaries) are areas of consideration. Higher evaluation ratings will be given for those project examples which are similar to the CDC Project which clearly demonstrate a contractor's capabilities to construct a project of this size, and execute the project successfully while

containing costs and maintaining schedule. In addition, those offers that include military construction projects similar in type and size will be rated more favorably than those without such construction similarity. Projects meeting the $3 million criterion in Paragraph 6.1.1 will be rated higher than those not meeting the minimum. Projects that do not meet the similarity criterion identified in Paragraph 6.1.1 will be rated lower than those projects meeting this criterion. Projects that appear to have been performed by a contractor's office other than the regional office that will be performing the work on this Base will be rated less favorably than those completed by the regional office. Projects that are not yet complete will be rated lower than those that are complete. Projects showing significant cost and time growth will be rated less favorably than those that maintain the contract completion date and the original award amount. Omission of requested information will result in lower ratings than those who provide all information identified in the paragraph above.

6.2 TAB 2 - Past Performance, Construction.

6.2.1 Submission Requirements. Submit past performance ratings. **All** Construction Contract Administration Support System (CCASS) ratings for all Corps of Engineer projects constructed by the proposer in the past five years should be submitted. For projects cited in Tab 1, which were constructed for other government entities, submit the performance appraisal sheets used by that government entity. For all private sector projects cited in Tab 1, submit a Performance Evaluation Sheet (a blank copy is attached to this section) completed by an owner or owner's representative and not affiliated with your firm. The government reserves the right to pull all copies of CCASS records contained in the Corps of Engineers CCASS database. Copies of records contained in the Corps of Engineers CCASS Database may be requested by fax on company letterhead at the following telefax number: (503) 808-4596.

6.2.2 Evaluation. Higher evaluation ratings may be awarded for Outstanding evaluations. In descending order, lower ratings may be given for past evaluations of Above Average, Satisfactory, Marginal, and Unsatisfactory. If an offeror has no past performance ratings in CCASS, performance ratings from other Construction Performance Rating System used by other government entities, and no Performance Evaluation sheets are available for private sector work, a neutral rating will be given. CCASS Ratings will be given more weight than equivalent performance ratings for other types of evaluations. The Government may, at its discretion, contact references cited to verify the information contained therein.

6.3 TAB 3 – Qualifications of Construction Personnel/Mechanical & Electrical Sub-Contractors. This tab consists of two sub-factors of equal importance, which will be combined into a single rating for the tab.

6.3.1 Submission Requirements.

a. Part 1 – Construction Personnel. In Part 1 of this tab, the offeror should submit the names and resumes for key construction personnel that will be assigned to this project. In

addition, provide a summary of the duties and responsibilities of these individuals that clearly indicate separate duties and responsibilities for each individual. Note that each of the listed personnel must have separate and distinct responsibilities – no single person may perform the duties of more than one position. This portion of the tab should include data on the following personnel:

Project Manager
Project Superintendent
Contractor Quality Control (CQC) System Manager

The proposal should clearly present the credentials of each person and show that each meets the requirements listed below. Each resume should include examples of project experience (including what capacity the individual served on each project), as well as the dates (month and year) employed on each project in that capacity, and the monetary size of each project cited as experience. Resumes should be listed in reverse chronological order, with the latest experience listed first, and all time gaps on each resume fully explained. In addition, the educational qualifications of the proposed personnel should be submitted. Prior experience on military construction projects and projects of this type and size is preferred and will be evaluated more favorably.

Project Manager. The Project Manager should be a degreed or registered engineer, architect, or graduate construction manager and have at least 5 years experience as a Project Manager on projects similar in monetary size and/or scope to this project.

Project Superintendent. The Project Superintendent should be an experienced construction person having at least 5 years experience as a Project Superintendent on projects similar in monetary size and/or scope to this project.

Contractor Quality Control (CQC) System Manager. The Contractor Quality Control System (CQC) Manager should have a minimum of 5 years experience as a CQC System Manager on projects similar in monetary size and/or scope to this project.

b. Part 2 – Mechanical & Electrical Sub-Contractors. In this portion of the tab, provide the name of the proposed mechanical subcontractor and electrical sub-contractor, along with a brief resume (1 or 2 sheets) for each company. The proposal should only contain the name and resume for one mechanical and one electrical sub-contractor. If more than one sub will be used for this project, a second mechanical or electrical may be added if a statement explaining why the second sub-contractor is included. Resumes should consist of a brief narrative of the company, presentation of relevant experience by the sub-contractor on similar projects (relevant experience is defined in Paragraph 6.1.1 above), and any other information pertinent to this project. In addition, indicate the CCASS or DUNS number of the subcontractor on the resume. CCASS Ratings will be pulled (by the government), if available, for the proposed mechanical subcontractor and electrical sub-contractor, and evaluated. Higher evaluation ratings will be awarded for resumes demonstrating exceptional qualifications and for

outstanding evaluations. In descending order, lower ratings may be given for past evaluations of Above Average, Satisfactory, Marginal, and Unsatisfactory. If an offeror has no past performance evaluations within the CCASS database, a neutral rating will be awarded for the performance rating portion of this factor.

Proposers should not submit data on subcontractors that they do not intend to utilize in the performance of an ensuing contract award. If, after award and because of reasons beyond the control of the selected offeror, the named individuals or sub-contractors identified in the proposal are not able to fulfill this obligation, replacement personnel/subcontractors with similar skills and experience equal to those presented in the proposal shall be presented to the Contracting Officer for approval. The Contractor shall obtain the Contracting Officer's written consent before making any substitutions for these designated personnel or the sub-contractors.

6.3.2 Evaluation. The evaluation factor for this tab consists of two sub-factors, which will be combined into a single rating for the tab and combined with all other technical ratings for evaluation.

a. Part 1 – Construction Personnel: Qualifications of key construction personnel assigned to this project will be considered (Project Manager, Project Superintendent, and Contractor Quality Control System Manager). Higher evaluation ratings may be given for military construction project experience, longevity of experience at the position being proposed, education, and experience on projects similar to this project. In addition, the proposed personnel will be reviewed to insure the requirements for the position identified are met. Evaluation ratings may be reduced for those not meeting the requirements identified above for this factor, and for resumes not providing the information requested.

b. Part 2 – Mechanical & Electrical Sub-Contractors: The resumes and past performance ratings of the proposed mechanical & electrical sub-contractors will be evaluated. CCASS ratings will be pulled by the Omaha District for the proposed Mechanical and Electrical sub-contractors and evaluated. Higher evaluation ratings will be awarded for resumes demonstrating exceptional qualifications and for Outstanding evaluations. In descending order, lower ratings may be given for past evaluations of Above Average, Satisfactory, Marginal, and Unsatisfactory. If an offeror has no past performance evaluations within the CCASS database, a neutral rating will be awarded for the performance rating portion of this factor.

6.4 TAB 4 – Project Management Plan (PMP).

6.4.1 Submission Requirements. The offeror should provide a comprehensive PMP developed specifically for this project, which will become an integral part of the resultant contract. The PMP should include an explanation of the management approach for the construction team, clearly showing how the prime contractor will manage the construction of the project to insure a well-coordinated quality product, completed on time and with a minimum amount of contract modifications. It should include: method of management of all sub-contractors, specific quality

control procedures, phasing, schedule development and methods to be utilized to maintain the schedule, and an organization chart showing the inter-relationship of management and various team components, including the Corps of Engineers. In addition, it should address the acquisition of environmental permits in a timely fashion, safety, preparation and submission of As-Built documents upon construction completion, and contract close-out. The information in the PMP should make it clear that the offeror has the ability to deliver a quality product and effectively manage all subcontractors on the team, as well as the ability to coordinate all work throughout the construction phase. As a minimum, the PMP should address all of the following:

- Management Approach
- Quality Control Procedures
- Sub-Contractor Management
- Schedule development and procedures to maintain performance schedule
- Organization Chart showing inter-relationship of management and various team components.
- Acquisition of Environmental Permits
- Safety
- Preparation and submission of As-Built documents
- Contract close-out

6.4.2 Evaluation. The quality of the offeror's PMP will be evaluated. Higher evaluation ratings will be achieved for a PMP which addresses all items requested in a thorough and comprehensive manner, and that demonstrates an effective plan for construction and close-out of the project.

6.5 TAB 5 – Schedule

6.5.1 Submission Requirements. The Offeror should propose the number of calendar days of construction required to complete the project. This schedule should consist of a two or three page schedule presenting the contractor's schedule, and illustrated by a bar or gantt chart showing phasing of major items of work. In addition to the bar or gantt chart, this tab should include a single sheet stating the number of days proposed for completion (this sheet should match the number of days proposed by the contractor on the SF 1442, Block 11). The number of days proposed on the schedule must match that entered by the offeror on the SF 1442, Block 11, Page 00010-1 of the RFP. The number of days cannot exceed 480 calendar days. The number of days proposed by the Offeror will become a contract requirement for the successful Offeror. A Network Analysis System (NAS) or Critical Path Method (CPM) schedule is **NOT** required for this Tab.

6.5.2 Evaluation. The offeror's proposed construction duration and schedule will be evaluated. The number of days may not exceed 480 calendar days. Higher evaluation ratings may be given for shorter construction durations, while lower ratings may be given for longer construction durations. In addition, schedules depicting an unrealistically short construction duration may be given lower ratings than those showing a more realistic duration.

6.6 TAB 6 – Utilization of Small Business Concerns.

6.6.1 Submission Requirements. The Offeror, **if not a Small Business Concern**, should demonstrate through submission of a narrative the offeror's plan to identify, commit and utilize Small Business **(SB)**, Small Disadvantaged Business **(SDB)**, HUBZone Small Business, Women-owned Small Business **(WOSB)** concerns, and Service-Disabled Veterans **(SDV)** as team members, subcontractors and/or suppliers in the performance of the resultant contract of this solicitation. **Note that this Tab is not requesting a Sub-Contracting Plan.** It is the policy of the U.S. Army Corps of Engineers, Omaha District (CENWO) that small business concerns have the maximum practicable opportunity to participate in performing contracts awarded by the Contracting Activity . It is further the policy of the Omaha District that its prospective prime contractors **(Large Business Only)** demonstrate the extent they plan to utilize small business concerns in any resultant contract and provide assurance in its offer that small business concerns will have maximum subcontracting opportunities in its prime contracts. **If the Contractor is a Small Business Concern, this tab may include a single sheet stating that the Contractor is a Small Business Concern, in lieu of compiling the information requested herein.** The evaluation of utilization and participation of small business concerns is separate and distinct from the requirement at Federal Acquisition Regulation (FAR) Clause 52.219-9, Small Business Subcontracting Plan.

6.6.1.1 Definitions:

a. Small Business Concerns. For the purpose of this section, small business concerns refer to Small Business, Small Disadvantaged Business, Women-owned Small Business, HUBZone Small Business, and Service-Disabled Veterans.

b. Prime Contractor. For the purpose of this section, a prime contractor refers to both large and small contractors.

c. Offeror. For the purpose of this section, offeror refers to both large and small contractors.

d. Target. "Target" is the term the U.S. Army Corps of Engineers uses to replace "floor" and or "goal". It represents the minimum level for small business performance.

6.6.1.2 Tab 6 Required Information: This tab should include the following information for purposes of proposal evaluation:

a. Development of Percentage Floors. Development of percentage floors based on planned subcontracting which is challenging yet realistic. **(Applicable to Large Business Only).** The following floors are considered reasonable and obtainable for projects awarded in Fiscal Year 2004:

- 57.2% of planned subcontracting dollars to be placed with all small business (SB)

concerns.

- 10.0% of planned subcontracting dollars to be placed with those small business concerns owned and controlled by socially and economically disadvantaged individuals (SDB).

- 10.0% of planned subcontracting dollars to be placed with women-owned small business (WOSB) concerns.

- 3.0% of planned subcontracting dollars with Service Disabled Veterans Small Business (SDVB) concerns.

- 3.0% of planned subcontracting dollars with Hubzones Small Business Concerns.

b. Past Performance in Meeting Small Business Floors. Demonstrate how floors for Small Business participation were satisfied on previous contracts, extent to which the prime has historically been successful in establishing realistic yet challenging goals, and evidences the ability to achieve them. The Offeror should submit data on Past Performance in meeting small business goals which will demonstrate how goals for small business concerns participation on previous contracts was satisfied. The data to be provided should include: (1) Client/Customer (2) Contract/Identification Number (3) Project Description (4) Contract Amount (5) Goals established for that project (6) Actual percentages met for that contract (7) Reference or Point of Contract (to include address and telephone number).

c. Demonstrate utilization and participation of small business concerns, clearly stated factors that demonstrate strong commitments to use SB, SDB, WOSB, SDVSB, and HubZone as team members, subcontractors, and/or suppliers. The proposal should clearly state positive steps taken to demonstrate a strong commitment to use small business concerns. Enforceable commitments to use small business concerns will be weighed more heavily than non-enforceable ones.

d. Description of supplies and services to be subcontracted and planned for subcontracting to SBs, SDBs, WOSBs , SDVSBs, and HUB-Zones.

e. Assurances that the offeror will include the clause at FAR 52.219-8, Utilization of Small Business Concerns in all subcontracts that offer further subcontracting opportunities, and that the offeror will require subcontractors (including small business concerns) that receive subcontracts in excess of $500,000 ($1,000,000 for construction) to adopt a small business participation program similar to the requirements of the resultant contract.

6.6.2 Evaluation. Proposals will be evaluated on their proposed plan for the following areas. Those firms providing all information requested, demonstrating a strong commitment to utilization of Small Business, and demonstrating past performance in meeting small business goals will be given higher ratings than those that do not.

a. Development of Percentage targets.

b. Past Performance in Meeting Small Business targets.

c. Demonstration of a Strong Commitment to Utilization and Participation of Small Business Concerns

d. Description of Supplies and Services to be Subcontracted

e. Assurances that the offeror (if a large business) will include the FAR Clause 52.219-8 Utilization of Small Business Concerns in all Subcontracts

If the offeror is a Small Business Concern, they may include a single sheet stating that the offeror is a Small Business Concern, in lieu of compiling the information requested herein. Small businesses will be given the maximum rating for this factor.

6.7 TAB 7 - Price.

6.7.1 Submission Requirements. The offeror should submit **only one original** of the following information **in a separate binder** (Tab 7). The binder shall contain the following information:

a. Section 00010, Solicitation/Contract Form and Pricing Schedule. Include the completed SF Form 1442 (Pages 00010-1 and 00010-2) of the RFP, along with the completed Pricing Schedule (Pages 00010-3 thru 00010-5). The total cost for the construction will be considered for evaluation, including all options. Proposed price for the construction of this project will be considered for evaluation and assist in establishment of the competitive range (if one is established).

b. Section 00600, Representations, Certifications and Other Statements of Offerors. These items are not considered for evaluation, but are required as part of the offeror's proposal of this solicitation. The information requested in this Section needs to be fully completed. The submitted information will be reviewed for completeness by Contracting Personnel.

c. Pre-Award Survey Information (Local Provision) (Sep 93). In accordance with FAR Clause 52.228-15 PERFORMANCE AND PAYMENT BONDS, the following information should be submitted with each offer. Submission of this information will expedite the award process.

(1) Financial:

a. Name, address, and fax number of Financial Institution
b. Name and phone number of finance individual (primary and alternate) to be contacted for information

(2) Bonding Information: Provide the name, address, regular phone number and fax number of the offeror's Surety Company.

d. Small Business Sub-Contracting Plan. If a large business and the proposal **exceeds $1,000,000** or more for construction, a Small Business Subcontracting Plan is required at the time your offer is submitted. A SAMPLE Small Business Subcontracting Plan is attached to this section of the solicitation. This plan is not a part of the technical evaluation. However, an acceptable Sub-Contracting plan must be approved and in place prior to contract award. Submission with the proposal will expedite contract award. The plan will be reviewed for compliance with the established guide in Appendix DD, which is attached to this section of the solicitation.

6.7.2 Evaluation. Price will be subjectively evaluated for Best Value and Realism by the Government, considering total cost of the basic and all option items to reach the best value for the Government, price and other factors considered.

(a) Best Value is defined as the expected outcome of an acquisition that, in the Government's estimation, provides the greatest overall benefit in response to the requirement, Technical and Price factors considered.

(b) Realism is defined as costs in an offeror's proposal considered realistic for the work to be performed, reflecting a clear understanding of the requirements, and consistent with the various elements of the offeror's technical proposal (all Tabs other than Price). Note that all evaluation factors other than Price, when combined, are approximately equal to the Price evaluation.

Other elements requested in Tab 7 will not be used in the Best Value Analysis, but are required as part of the proposal.

7. COMPETITIVE RANGE.

Upon completion of proposal evaluation, if discussions are determined to be needed, the Government may establish a competitive range for the purpose of conducting written discussion. The competitive range shall be determined on the basis of the factors stated in the solicitation and shall include all proposals that have a reasonable chance of being selected for award. **The Government intends to award a contract on the basis of initial offers received, without discussions.** Therefore, each initial offer should contain the offeror's best terms from a cost or price and technical standpoint. Notwithstanding, the Government may conduct written discussions with all responsible offerors who submit proposals and are considered within the competitive range. Offerors submitting proposals determined outside of the competitive range (lacking a reasonable chance of being selected for contract award) will be notified in writing at the earliest practicable time.

8. CLARIFICATIONS AND DISCUSSIONS.

a. Clarifications. Clarification is defined is defined in Paragraph 2(d)(6) above. During the evaluation, if a proposal requires clarification for the Board to complete its evaluation, a written list of questions and/or comments to be discussed with the offeror will be provided to the offeror by the Contracting Representative or Contracting Officer. Any request for clarifications will be issued by letter. All contact with offerors will be through the Contracting Division.

b. Communications. Communications as defined in paragraph 2(d)(7) above, between the Government and offerors, after receipt of proposals, leading to establishment of the competitive range will not occur without the participation of the Contracting Officer.

c. Discussions. If discussions as defined in paragraph 2(d)(8) above are necessary, written and/or verbal, they will be conducted with all firms in the competitive range once a written Determination to hold such discussions has been approved by the Contracting Officer. FAR 15.306(d)(3) and the Comptroller General Decisions indicate that all content of discussions are a matter within the Contracting Officer's judgment. Discussions involve an exchange of information essential to determining the acceptability of a proposal. During the exchange of information, offerors must be informed of all deficiencies and significant weaknesses in their proposals and offered an opportunity to revise their proposals. No technical leveling, transfusion or auction techniques shall result from discussions. Discussions will be concluded as of the date specified for receipt of a Final Revised Proposal from those offerors determined to be in the competitive range.

9. FINAL PROPOSAL REVISIONS.

If discussions are held, upon their completion the Government shall issue to all Offerors within the competitive range a request for final proposal revisions specifying the exact date and time for submission of the revision. Any verbal revisions to proposals made during the course of discussions must be included in the offeror's written Final Revised Proposal. Any verbal revisions not included in the final revision will not be considered in re-evaluating the proposals. Any verbal request for a Final Revised Proposal shall be confirmed in writing. The confirmation shall include:

(1) Notice that discussions are concluded.
(2) Notice that this is the opportunity to submit a Final Revised Proposal.
(3) Establishment of a common cutoff date and time that allows the offerors reasonable opportunity for submission of written Proposal revisions.
(4) Notice that Proposal Revisions, and modifications thereto, must be received by the date, time, and in the place specified in the notice, or they are subject to the Late Offers provision in the solicitation in Section 00100.

Following the evaluation of final proposal revisions, the Government will select the offeror whose initial and final proposal revision presents the Best Value and is most advantageous,

considering only the factors included in the solicitation, to the Government.

10. DEBRIEFING

Each offeror, successful or unsuccessful, will have the opportunity, in accordance with Federal Acquisition Regulation (FAR) 15.505 and 15.506, to receive one debriefing. Offerors are required to submit a written request for debriefing and discussion of the evaluation of its proposal within three (3) calendar days after receipt of notice of award. The debriefing of all offerors, successful or unsuccessful, will be conducted by the Contracting Officer in accordance with the FAR. Each offeror shall be provided only one debriefing, either post award or pre-award, at their choosing. The Contracting Specialist will coordinate and schedule the debriefings. Debriefing participation will include the Contracting Officer, chairperson of the SSEB, and Contracting Specialist with additional support from other members of the SSEB as required.

PERFORMANCE EVALUATION (CONSTRUCTION)

1. CONTRACT NUMBER

2. CEC NUMBER

IMPORTANT: Be sure to complete Part III - Evaluation of Performance Elements on reverse.

PART I - GENERAL CONTRACT DATA

3. TYPE OF EVALUATION *(X one)*

☐ INTERIM *(List percentage _____%)* ☐ FINAL ☐ AMENDED

4. TERMINATED FOR DEFAULT ☐

5. CONTRACTOR *(Name, Address, and ZIP Code)*

6.a. PROCUREMENT METHOD *(X one)*

☐ SEALED BID ☐ NEGOTIATED

b. TYPE OF CONTRACT *(X one)*

☐ FIRM FIXED PRICE ☐ COST REIMBURSEMENT

☐ OTHER *(Specify)*

7. DESCRIPTION AND LOCATION OF WORK

8. TYPE AND PERCENT OF SUBCONTRACTING

9. FISCAL DATA ▶	a. AMOUNT OF BASIC CONTRACT $	b. TOTAL AMOUNT OF MODIFICATIONS $	c. LIQUIDATED DAMAGES ASSESSED $	d. NET AMOUNT PAID CONTRACTOR $
10. SIGNIFICANT DATES ▶	a. DATE OF AWARD	b. ORIGINAL CONTRACT COMPLETION DATE	c. REVISED CONTRACT COMPLETION DATE	d. DATE WORK ACCEPTED

PART II - PERFORMANCE EVALUATION OF CONTRACTOR

11. OVERALL RATING *(X appropriate block)*

☐ OUTSTANDING ☐ ABOVE AVERAGE ☐ SATISFACTORY ☐ MARGINAL ☐ UNSATISFACTORY *(Explain in Item 20 on reverse)*

12. EVALUATED BY

a. ORGANIZATION *(Name and Address (Include ZIP Code))*		b. TELEPHONE NUMBER *(Include Area Code)*
c. NAME AND TITLE	d. SIGNATURE	e. DATE

13. EVALUATION REVIEWED BY

a. ORGANIZATION *(Name and Address (Include ZIP Code))*		b. TELEPHONE NUMBER *(Include Area Code)*
c. NAME AND TITLE	d. SIGNATURE	e. DATE

14. AGENCY USE *(Distribution, etc.)*

PART III - EVALUATION OF PERFORMANCE ELEMENTS

N/A = NOT APPLICABLE O = OUTSTANDING A = ABOVE AVERAGE S = SATISFACTORY M = MARGINAL U = UNSATISFACTORY

15. QUALITY CONTROL	N/A	O	A	S	M	U
a. QUALITY OF WORKMANSHIP						
b. ADEQUACY OF THE CQC PLAN						
c. IMPLEMENTATION OF THE CQC PLAN						
d. QUALITY OF QC DOCUMENTATION						
e. STORAGE OF MATERIALS						
f. ADEQUACY OF MATERIALS						
g. ADEQUACY OF SUBMITTALS						
h. ADEQUACY OF QC TESTING						
i. ADEQUACY OF AS-BUILTS						
j. USE OF SPECIFIED MATERIALS						
k. IDENTIFICATION/CORRECTION OF DEFICIENT WORK IN A TIMELY MANNER						

16. EFFECTIVENESS OF MANAGEMENT	N/A	O	A	S	M	U
a. COOPERATION AND RESPONSIVENESS						
b. MANAGEMENT OF RESOURCES/ PERSONNEL						
c. COORDINATION AND CONTROL OF SUBCONTRACTOR(S)						
d. ADEQUACY OF SITE CLEAN-UP						
e. EFFECTIVENESS OF JOB-SITE SUPERVISION						
f. COMPLIANCE WITH LAWS AND REGULATIONS						
g. PROFESSIONAL CONDUCT						
h. REVIEW/RESOLUTION OF SUBCONTRACTOR'S ISSUES						
i. IMPLEMENTATION OF SUBCONTRACTING PLAN						

17. TIMELY PERFORMANCE						
a. ADEQUACY OF INITIAL PROGRESS SCHEDULE						
b. ADHERENCE TO APPROVED SCHEDULE						
c. RESOLUTION OF DELAYS						
d. SUBMISSION OF REQUIRED DOCUMENTATION						
e. COMPLETION OF PUNCHLIST ITEMS						
f. SUBMISSION OF UPDATED AND REVISED PROGRESS SCHEDULES						
g. WARRANTY RESPONSE						

18. COMPLIANCE WITH LABOR STANDARDS						
a. CORRECTION OF NOTED DEFICIENCIES						
b. PAYROLLS PROPERLY COMPLETED AND SUBMITTED						
c. COMPLIANCE WITH LABOR LAWS AND REGULATIONS WITH SPECIFIC ATTENTION TO THE DAVIS-BACON ACT AND EEO REQUIREMENTS						
19. COMPLIANCE WITH SAFETY STANDARDS						
a. ADEQUACY OF SAFETY PLAN						
b. IMPLEMENTATION OF SAFETY PLAN						
c. CORRECTION OF NOTED						

20. REMARKS *(Explanation of unsatisfactory evaluation is required. Other comments are optional. Provide facts concerning specific events or actions to justify the evaluation. These data must be in sufficient detail to assist contracting officers in determining the contractor's responsibility. Continue on separate sheet(s), if needed.)*

SMALL BUSINESS SUBCONTRACTING PLAN
SAMPLE

DATE: _____

CONTRACTOR: _____

ADDRESS: _____

PHONE NO: _____

PROJECT TITLE: _____

SOLICITATION NO: _____

1. In accordance with the contract clauses at 52.219-8 and 52.219-9, (name of contractor) submits the following Subcontracting Plan for Small Business (SB), Small Disadvantaged Business (SDB), Women-owned Business (WOSB), Historically Underutilized Business Zone (HubZone), Historical Black Colleges and Minority Institutions (HBCU/MI) Service-Veteran-Owned Small Business (SVOSB) Concerns.

2. Corresponding dollar values for percentages cited in paragraph 3:

a. Total contract amount is $_____.

b. Total dollars to be subcontracted (to all types of businesses): $_____.

c. Total dollars to be subcontracted to Small Business (SB) concerns: $_____.

d. Total dollars to be subcontracted to Small Disadvantaged Business (SDB) concerns: $_____.

e. Total dollars to be subcontracted to Woman-Owned Small Business (WOSB) concerns: $_____.

f. Total dollars to be subcontracted to Hubzone business concerns: $_____.

g. Total dollars to be subcontracted to Historical Black Colleges and Minority Institutions (HBCU/MI: $_____.

h. Total dollars to be subcontracted to Service-Disable Veteran-Owned Small Business (SDVOB): $_____.

3. The following percentage goals (expressed in terms of a percentage of total planned subcontracting dollars) are applicable to the contract awarded under the solicitation cited above.

a. The total estimated percentage of all planned subcontracting to all types of business concerns under this contract is: _____%.

b. Small Business Concerns: _____% of total planned subcontracting dollars under this contract will go to subcontractors who are small business concerns including 3c.and 3d.

c. Small Disadvantaged Business Concerns: _____% of total planned subcontracting dollars under this contract will go to subcontractors who are small disadvantaged individuals. **NOTE:** Women-owned businesses are not considered a small disadvantaged business. Do not include subcontract awards to women-owned businesses in your calculations for paragraph 3c unless the firm meets the definition of a small disadvantaged business.

d. Small Woman-Owned Business Concerns: _____% of total planned subcontracting dollars under this contract will go to subcontractors who are small woman-owned businesses.

e. Historical Black Colleges and Minority Institutions: ____% of total planned subcontracting dollars under this contract will go to subcontractors who historical black colleges and/or minority institutions.

f. Service-Disabled Veteran-Owned Small Business: ____% of total planned subcontracting dollars under this contract will go to subcontractors who historical black colleges and/or minority institutions.

4. The principal items or areas we will subcontract under this contract are (NOTE: **Construction contractors remember to include materials/supplies** when developing plan. Also, list each subcontracted task by Division and Section number):

_____

_____

_____

a. Of the items or areas stated in 4, the following are to be subcontracted to Small Businesses:

_____

_____

_____

b. Of the items or areas stated in 4, the following are to be subcontracted to Small Disadvantaged Businesses:

_____

_____

_____

c. Of the items or areas stated in 4, the following are to be subcontracted to Small Women-Owned Businesses:

_____

_____

_____

d. Of the items or areas stated in 4, the following are to be subcontracted to Historically Underutilized Business Zones:

_____

_____

_____

e. Of the items or areas stated in 4, the following are to be subcontracted to Historical Black Colleges and Minority Institutions:

_____

_____

_____

f. Of the items or areas stated in 4, the following are to be subcontracted to Service-Disabled Veteran-Owned Small Business:

_____

_____

_____

****NOTE: SEE LAST PAGE IF THIS SOLICITATION HAS OPITONS** (DELETE THIS STATEMENT FROM YOUR PLAN)******

5. Provide a description of the method your firm used to develop the subcontracting goals in paragraph 2. Identify specific SD, SDB, WOSB, HubZones, SDVOB, HBCU or MI concerns planned to be subcontractors for the item/service efforts stated in paragraph4.

_____

_____

_____

_____

_____

6. Indirect costs were ( ) were not ( ) used in establishing subcontracting goals. **If indirect costs are included in your goals, furnish a description of the method used to determine the proportionate share of indirect costs to be incurred with (i) small business concerns (ii) small disadvantaged business concerns and (iii) women-owned.**

7. Past Performance Record: Demonstrate the extent to which the Prime has historically been successful in establishing realistic yet challenging goals and evidences ability to achieve them.

8. The following individual will administer this Subcontracting Plan on behalf of (name of contractor):

Name: Title:

Address:

Telephone:

The aforementioned individual's specific duties will include, but is not limited to:

a. Developing and maintaining source lists of small, small disadvantaged and women-owned small business concerns. Sources used are the Small Business Administration's Pro-Net, the National Minority Purchasing Council Vendor Information Service, the Minority Business Development Agency, US Department of Commerce, Local Minority Business Development Centers, Economic Development Centers, and National Center for American Indian Enterprise Development.

b. Assuring the inclusion of small, small disadvantaged, and women-owned small business concerns in all solicitations for products or services which they are capable of providing; and ensuring that all solicitations are structured to permit the maximum possible participation by small, small disadvantaged and women-owned small business concerns.

c. Establishing and maintaining records of all subcontract awards to ensure appropriate documentation of non-selection of bids submitted by a small, small disadvantaged business, or women-owned small business concerns.

d. Preparing and submitting the Subcontracting Report for Individual Contracts (SF 294) and the Summary Subcontract Report (SF 295) in accordance with instructions provided, and coordinating and preparing for all compliance reviews by Federal agencies.

e. Promoting activities necessary to further the intent of the subcontracting plan. Activities include motivational training of purchasing personnel; attendance at workshops, seminars and trade fairs conducted by or on behalf of small business and/or small disadvantaged and/or women-owned small business concerns; and general cooperation with members of the small, small disadvantaged and women-owned small business concerns or their representatives.

9. The following steps will be taken to ensure that small, small disadvantaged, and women-owned small business concerns receive notice of and have an equitable opportunity to compete for intended awards of subcontracts and/or purchase orders for the products and/or services describe in paragraph 4 above:

a. Sources will be requested through SBA's PRO-Net system, business development organizations, minority and small business trade associations and at small, minority and women-owned small business procurement conferences; sources will be contacted; and bidding materials will be provided to all responding parties expressing an interest.

b. The firm will conduct and maintain internal motivational training to guide and encourage purchasing personnel to maintain source lists and guides to small, small disadvantaged, and women-owned small business concerns. Purchasing activities will be monitored to ensure sufficient time is allowed for interested bidders to prepare bids and to ensure continuous compliance with the approved Subcontracting Plan.

10. [Name of contractor] agrees that the clause entitled "Utilization of Small, Small Disadvantaged and Women-Owned Business Concerns" will be included in all subcontracts that offer further subcontracting opportunities. All "other than small" subcontractors who receive subcontracts in excess of $500,000 ($1,000,000 in the case of construction) will be required to adopt a plan similar to this one. Such plans will be reviewed to assure that all minimum requirements of an acceptable subcontracting plan have been satisfied.

The acceptability of proposed goals shall be determined on a cases-by-case basis depending on the supplies/services involved, the availability of potential small, small disadvantaged, and women-owned subcontractors, and prior experience. Once approved and implemented, plans will be monitored through the submission of periodic reports or, as time and availability of funds permit, periodic visits to subcontractors facilities to review applicable records and subcontracting program progress.

11. The Firm agrees to submit periodic reports and cooperate in any studies or surveys required by the Contracting Activity or Small Business Administration to determine the extent of the firm compliance with the subcontracting plan.

12. (Name of Contractor) agrees to maintain at least the following types of records to document compliance with the Subcontracting Plan:

a. The names of all organizations, agencies, and associations contacted for small, small disadvantaged, and women-owned small business sources, along with records of attendance at conference, seminars and trade fairs where additional sources were developed.

b. Source lists, guides, and other data identifying small business concerns, small disadvantaged business concerns and women-owned small business concerns.

c. Records of subcontracts award in excess of $100,000 will demonstrate how small business concerns, small disadvantaged business concerns and women-owned business concerns were solicited or provide an explanation as to why these business concerns were not considered for subcontracting opportunities.

d. Records of subcontract award data to include subcontractor's name and address, to be kept on a contract-by-contract basis.

e. Minutes of internal motivational and training meetings held for the guidance and encouragement of purchasing personnel, and records of all monitoring activities performed for compliance evaluation.

f. Copies of SF 294 and SF 295 showing date and place of filing and copies of all other reports or results of reviews conducted by the contracting agency or other interested agencies of the Federal government to monitor our compliance with this Subcontracting Plan.

13. (Name of Contractor) will submit a SF 295, Summary Subcontract Report, on Corps of Engineers projects only. The SF 295 shall be completed and distributed in accordance with the Corps of engineers Supplemental Instructions. (Name of Contractor) will not report Corps of Engineers projects through any other Agency unless authorized by the Contracting Officer.

SIGNATURE PAGE

BY: _____

_____
Signature and Title of CEO
Company Name

_____
Date

Recommendation:

BY: _____

_____
Chief, Small Business Office
USACE, Omaha District

_____
Date

Approved:

BY: _____

_____
Contracting Officer
USACE, Omaha District

_____
Date

NOTE: If this solicitation has options, the plan must contain separate goals for ***each*** option.
EXAMPLE:

	Dollars	Percentage
1. Option #_____total:	$_____	_____
2. Total to be subcontracted to all businesses:	$_____	_____
a. Subcontracted to Small Business:	$_____	_____
b. Subcontracted to Small Disadvantaged Businesses:	$_____	_____
c. Subcontracted to Women-Owned Small Businesses:	$_____	_____
d. Subcontracted to Historical Black Colleges and Minority Institutions:	$_____	_____.

.AFARS -- Appendix DD

Subcontracting Plan Evaluation Guide

June 1, 1996

Part 1 -- Introduction

DD-100 Purpose.

The guide provides a methodology for uniform and consistent evaluation of subcontracting plans within the Army. It is designed to facilitate compliance with the mandates of Public Law to increase opportunities for small and small disadvantaged businesses.

DD-101 Applicability.

Except for subcontracting plans for commercial items, use this guide to review all subcontracting plans, including those submitted in response to the conditions described in FAR 19.705-2(d) and DFARS 219.705-2(d). See 19.708(b)(1) for special notices to be inserted in the solicitation regarding submission of subcontracting plans. A copy of the completed evaluation shall be included in the contract file.

DD-102 Goals.

Contracting officers must place special emphasis on negotiating reasonable goals in subcontracting plans. The goals must be realistic, challenging and attainable. The plan must demonstrate a real commitment to, and an active involvement in, providing subcontracting opportunities for small and small disadvantaged businesses.

DD-103 Scoring.

Score subcontracting plans in the context of the particular procurement. For instance, in smaller dollar value contracts, it may be impracticable or not cost effective for offerors to take the type of actions that may be appropriate in contracts for larger dollar values. However, in such cases, offerors must still address each element of the guide and discuss what they intend to do regarding each element. Contracting officers shall then assign appropriate point scores.

DD-104 Modification of Guide.

The evaluation guide and scoring system shall not be modified without the approval of the PARC. This approval authority may not be delegated.

DD-105 Use of Preaward Surveys.

For contracts administered by the Defense Contract Management Agnecy (DCMA), information needed to assess contractor compliance with subcontracting plans in current and previous contracts may be obtained by requesting a preaward survey in accordance with FAR 9.106.

Part 2 -- Scoring System

Point Range	Points Assigned
1. Policy statement or evidence of internal guidance to company buyers recognizing commitment to Pub.L. 99-661, Section 1207, and Pub.L. 100-180, Section 806.	*0-5*
0 No written policy statement in plan.	
1-2 Plan includes a general policy, but no evidence of recognition of special emphasis being placed on subcontracting with SDBs, HBCUs and MIs as a result of Pub.L.s.	
3-5 Definitive corporate and management commitment evidenced in individual plan and master plan by specifically referencing the Pub.L.s.	
2. Efforts to broaden SB and SDB active vendor base. (FAR 19.704(a), 52.219-9(d), DFARS Subpart 219.5, 219.704(a)(1), 219.705 and 252.219-7003)	*0-10*
0 Description of efforts merely parrots requirements of FAR to maintain listing of vendors.	
1-2 Contains evidence that effort is directed at increasing subcontracts to SBs and SDBs for non-complex and general housekeeping supplies or services normally awarded to firms already in existing vendor base.	
3-10 Addresses efforts to increase the number of SB and SDB sources awarded subcontracts, establishes plans to use competition restricted to SDBs and gives details about how plans to use competition restricted to SDBs will be accomplished. (DFARS 219.705-4 and Subpart	

219.5)

Note: After scoring the plan to this point, if zero points have been assigned for Element 2, proceed to Item 3, Outreach. If one or more points have been assigned for this Element 2, proceed to evaluation of the subelements labeled "minus 2" and "minus 3" to determine if points assigned so far must be reduced. Do not reduce points already assigned to less than zero. (No negative points are to be entered under "Points Assigned" for any Element.) These negative scores are additive; if both of the subelements apply, then minus five points are assessed to reduce points already assigned under this element 2.

minus 2 Includes efforts described above which rate 1-2 or 3-10 points but, when it would be appropriate, does not address effort to involve HBCUs and MIs in performing the contract for which the subcontracting plan is submitted. (DFARS 219.704(a)(1) and 219.705-4(d))

minus 3 Includes efforts described above which rate 1-2 or 3-10 points but does not address effort to identify and overcome obstacles which may prohibit award to HBCU and MI sources currently in vendor base.

3. Outreach (ongoing and planned actions) *0-10*
(FAR 19.704(a),19.705-4, 52.219-9(d) and 52.219-9(e), DFARS 219.705).

0 No mention of outreach.

1-4 Describes efforts to work with organizations in FAR 52.219-9(d)(11)(iv) to identify potential sources for items not traditionally awarded to SB or SDB firms. (FAR 52.219-9(d)(11)(iv) and 52.219-9(e))

5-10 Indicates intent to conduct reviews to determine the competence, ability, experience and capacity available in SB or SDB firms and to provide technical assistance to SBs and SDBs or explains why such reviews or technical assistance are not appropriate. (FAR 19.705-4(c) and 52.219-9(e))

Note: After scoring the plan to this point, if zero points have been assigned for Element 3, proceed to Item 4, Description of supplies and services. If one or more points have been assigned for this Element 3, proceed to evaluation of the subelement labeled "minus 3" to determine if points assigned so far must be reduced. Do not reduce points already assigned to less than zero. (No negative points are to be entered under "Points Assigned" for any Element.)

minus 3 Fails to indicate the extent to which HBCU and MI participation will be considered and facilitated in performing the contract for which the subcontracting plan is submitted, or fails to indicate other efforts to increase HBCU and MI participation in future DoD acquisitions. (DFARS 219.705-4(d))

4. Describes supplies and services to be subcontracted and planned for subcontracting to SBs, SDBs, HBCUs and MIs. (FAR 19.705-4(d), 52.219-9(d)(3), 52.219-9(e) and DFARS 219.705). 0-10

0 No mention.

1-4 Generic list of routine supplies and services included in materials listing for the specific contract.

5-7 Indicates intent to review major product/system components and key project elements of R&D, construction, service and spare parts contracts for subcontracting to SBs, SDBs, HBCUs and Mis. (FAR 19.705-4(d)(3) and (4), 52.219-9(e)(1) and (2) and DFARS 219.705)

8-10 Substantive plan actually targets specific SBs, SDBs, HCBUs and MIs for review to determine their competence, ability, experience and capacity and identifies specific components or major portions of the acquisition for consideration of SB, SDB, HBCU or MI competition. Also, indicates intent to work with large business subcontractors for major subsystems or key project elements to ensure "flowdown" of this philosophy. (FAR 19.705-4(d) and DFARS 219.705)

5. Describes specific efforts, based on results of efforts described in Elements No. 3 and No. 4 to ensure that SB, SDB, HBCU and MI concerns have equitable opportunity to participate in acquisitions. (FAR 19.704(a), 19.705-4, 52.219-9(d) and DFARS 219.705). 0-15

0 No mention.

1-4 Description of efforts merely parrots FAR 19.704(a)(3) and (6) and 52.219-9(d)(8).

5-8 Describes how the company intends to evaluate its own SB and SDB award performance and program effectiveness against the established goals, both company-wide and for the individual plan being negotiated. (FAR 19.704(a)(1) and (6) and 52.219-9(d)(11)(v))

9-12 Includes SBs, SDBs, HBCUs and MIs by name as members of original team for producing specific major

components or subassemblies, providing a major service or performing a significant portion of the effort. (DFARS 219.705-2(d))

13-15 Describes special efforts to establish long-range relationships with SBs, SDBs, HBCUs and Mis, including leader-follower techniques, when appropriate. (FAR 19.705-4(d)(4) and DFARS 219.705-2(d)

6. Development of percentage goal is based on planned subcontracting which is challenging, yet realistic. (FAR 19.705-4(d), DFARS 219.704(a)(1) and 219.705-4) 0-40

0 Fails to include a specific goal for subcontracting with SBs, SDBs, HBCUs and MIs or proposes zero percent goal without substantive justification.

1-5 Sets small business goal of less than 10 percent and/or SDB/HBCU/MI goal of two percent or less with no significant justification.

6-10 Sets goals of less than 10 percent (SB) and 2 percent (SDB), but contractor shows evidence of reasonable effort, including use of set-asides, to involve Sbs, SDBs, HBCUs or MIs in non-traditional areas.

11-20 Sets goals of over 10 percent (SB) and 2 percent (SDB) and also identifies specific SB, SDB, HBCU or MI concerns planned to be subcontractors, including the item or service or effort to be subcontracted. Indicates extent to which firms have participated in proposal preparation or otherwise indicates extent to which subcontracting to these firms may reasonably be assured. Goals are realistic in view of actions stated in other portions of the plan and make-or-buy plan, if applicable.

21-30 Same as for 11-20 points, but proposed percent of goal is reasonable in comparison with prior experience, yet indicates reasonable effort to improve on past experience in terms of dollars, number of SDBs, HBCUs, and MIs involved, and movement into area without previous SDB, HBCU or MI involvement.

31-40 Same as 21-30 points, but includes evidence that if SBs, universities or institutions other than HBCUs or MIs are performing on a major component or

subassembly, providing a major service or performing on a key project element, SDBs, HBCUs and MIs will also be given an opportunity to perform. Also, the percentage of the SDB, HBCU, MI goal compares favorably with the percentage of SB goal, consistent with the Government-wide goals of 20 percent to SB with five percent to SDB, or is otherwise explained, and the plan includes a forecast for improvement. (The SB and SDB goals in the subcontracting plan should approximate the ratio between the SB and SDB Government-wide goals.)

7. Past performance. 0-10

Extent to which the company has historically been successful in establishing realistic, yet challenging, goals and achieving them. Consider DCMC comments on prime contractor's justifications for prior failure to achieve goals. To avoid penalizing the contractor when there has been no previous defense contract, assign 10 points. (FAR 19.705-4(d)(1) and (d)(2)(iii), 19.706 and DFARS 219.706).

8. ***Other regulatory and statutory requirements.***

If any of the following are answered "NO," the plan is not acceptable and must be revised to comply prior to award:

Does the plan have --

A. A separate goal for SB and SDB? (FAR 19.704(a)(1) and FAR 52.219-9(d)(1) and (2))

YES NO

B. A separate goal for the basic contract and, if applicable, each option? (FAR 19.704(c))

YES NO

C. The name of the company employee responsible for administration of plan and employee's duties? (FAR 19.704(a)(2) and 52.219-9(d)(7))

YES NO

D. A statement affirming intent to comply with subcontracting "flowdown" provisions? (FAR 19.704(a)(4) and 52.219-9(d)(10))

YES NO

E. A statement affirming willingness to cooperate in studies and to provide reports? (FAR 19.704(a)(5) and 52.219-9(d)(10))

YES NO

F. A statement that indirect costs are either included or excluded from the proposed goals and, if included, how they will be prorated? (FAR 52.219-9(d)(6))

YES NO

G. A description of efforts to ensure that SBs and SDBs have an equitable opportunity to participate in the acquisition? (FAR 52.219-9(d)(8))

YES NO

H. A recitation of the types of records maintained to demonstrate procedures adopted to comply with the requirements and goal in the plan? (FAR 52.219-9(d)(11))

YES NO

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SECTION 00600
REPRESENTATIONS, CERTIFICATIONS & OTHER STATEMENTS OF OFFERORS

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SECTION 00600
REPRESENTATIONS, CERTIFICATIONS & OTHER STATEMENTS OF OFFERORS

The bidder (offeror) makes the following certification and representations as a part of the proposal, shall check the appropriate boxes, fill in the appropriate information, and provide signatures on the attached "Solicitation Form" (00600) pages, and submit with Standard Form 1442 (Section 00010).

1. (FAR 52.203-2) CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1985).

(a) The offeror certifies that -

(1) The prices in this offer have been arrived at independ-ently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other offeror or competitor relating to (i) those prices, (ii) the intention to submit an offer, or (iii) the methods or factors used to calculate the prices offered;

(2) the prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of a Sealed Bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and

(3) no attempt has been made or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.

(b) Each signature on the offer is considered to be a certification by the signatory that the signatory -

(1) is the person in the offeror's organization responsible for determining the prices being offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above; or

(2)(i) has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above _____
_____
_____ [insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization];

(ii) as an authorized agent, does certify that the principals named in subdivision (b)(2)(i) above have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above; and

(iii) as an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above.

(c) If the offeror deletes or modifies subparagraph (a)(2) above, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

2. (FAR 52.203-11) CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (APR 1991).

(a) The definitions and prohibitions contained in the clause, at FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions, included in this solicitation, are hereby incorporated by reference in paragraph (b) of this certification.

(b) The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief that on or after December 23, 1989, -

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement;

(2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the offeror shall complete and submit, with its offer, OMB standard form LLL, Disclosure of Lobbying Activities, to the Contracting Officer; and

(3) He or she will include the language of this certification in all subcontract awards at any tier and require that all recipients of subcontract awards in excess of $100,000 shall certify and disclose accordingly.

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to a civil penalty of not less than $10,000, and not more than $100,000, for each such failure.

3. TAXPAYER IDENTIFICATION (Local Provision).

(a) Definitions.

"Common parent," as used in this provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

"Taxpayer Identification Number (TIN)," as used in this provision, means the number required by the Internal Revenue Service (IRS) to be used by the offeror in reporting income tax and other returns. The TIN may be either a Social Security Number or an Employer Identification Number.

(b) All offerors must submit the information required in paragraphs (d) through (f) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the IRS. If the resulting contract is subject to the payment reporting requirements described in Federal Acquisition Regulation (FAR) 4.904, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) The TIN may be used by the Government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

(d) Taxpayer Identification Number (TIN).

[ ] TIN: _____.

[ ] TIN has been applied for.

[ ] TIN is not required because:

[ ] Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

[ ] Offeror is an agency or instrumentality of a foreign government;

[ ] Offeror is an agency or instrumentality of the Federal Government.

(e) Type of organization.

[ ] Sole proprietorship;

[ ] Partnership;

[ ] Corporate entity (not tax-exempt);

[ ] Corporate entity (tax-exempt);

[ ] Government entity (Federal, State, or local);

[ ] Foreign government;

[ ] International organization per 26 CFR 1.6049-4;

[ ] Other _____.

(f) Common parent.

[ ] Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this provision.

[ ] Name and TIN of common parent:

Name _____

TIN _____

(End of provision)

4. (FAR 52.204-5) WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS)[MAY 1999]

(a) *Definition*. Women-owned business concern, as used in this provision, means a concern that is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(b) *Representation. [Complete only if the offeror is a women-owned business concern and has not represented itself as a small business concern in paragraph (b)(1) of FAR 52.219–1, Small Business Program Representations, of this solicitation.]* The offeror represents that it [ ] is a women-owned business concern.
(End of provision)

5. (DFARS 252.204-7001) COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (AUG 1999).

(a) The offeror is requested to enter its CAGE code on its offer in the block with its name and address. The CAGE code entered must be for that name and address. Enter "CAGE" before the number.

(b) If the Offeror does not have a CAGE code, it may ask the Contracting Officer to request one from the Defense Logistics Information Service (DLIS). The Contracting Officer will-

(1) Ask the Contractor to complete section B of a DD Form 2051, Request for Assignment of a Commercial and Government Entity (CAGE) Code;

(2) Complete section A and forward the form to DLIS; and

(3) Notify the Contractor of its assigned CAGE code.

(c) Do not delay submission of the offer pending receipt of a CAGE code.

6. (FAR 52.209-5) CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (DEC 2001).

(a)(1) The Offeror certifies, to the best of its knowledge and belief, that—

(i) The Offeror and/or any of its Principals—

(A) Are [ ] are not [ ] presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have [ ] have not [ ], within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(C) Are [ ] are not [ ] presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in paragraph (a)(1)(i)(B) of this provision.

(ii) The Offeror has [ ] has not [ ], within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity *(e.*g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

This Certification Concerns a Matter Within the Jurisdiction of an Agency of the United States and the Making of a False, Fictitious, or Fraudulent Certification May Render the Maker Subject to Prosecution Under Section 1001, Title 18, United States Code.

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default. (End of Provision)

7. (DFARS 252.209-7001) DISCLOSURE OF OWNERSHIP OR CONTROL BY A FOREIGN GOVERNMENT THAT SUPPORTS TERRORISM (MAR 1998). [For Contracts exceeding $100,000]

(a) Definitions.

As used in this provision-

(1) "Government of a terrorist country" includes the state and the government of a terrorist country, as well as any political subdivision, agency, or instrumentality thereof.

(2) "Terrorist country" means a country determined by the Secretary of State, under section 6(j)(1)(A)) of the Export Administration Act of 1979 (50 U.S.C. App. 2405(j)(i)(A)), to be a country the government of which has repeatedly provided support for acts of international terrorism. As of the date of this provision, terrorist countries include: Cuba, Iran, Iraq, Libya, North Korea, Sudan, and Syria.

(3) "Significant interest" means-

(i) Ownership of or beneficial interest in 5 percent or more of the firm's or subsidiary's securities. Beneficial interest includes holding 5 percent or more of any class of the firm's securities in "nominee shares," "street names," or some other method of holding securities that does not disclose the beneficial owner;

(ii) Holding a management position in the firm, such as a director or officer;

(iii) Ability to control or influence the election, appointment, or tenure of directors or officers in the firm;

(iv) Ownership of 10 percent or more of the assets of a firm such as equipment, buildings, real estate, or other tangible assets of the firm; or

(v) Holding 50 percent or more of the indebtedness of a firm.

(b) Prohibition on award. In accordance with 10 U.S.C. 2327, no contract may be awarded to a firm or a subsidiary of a firm if the government of a terrorist country has a significant interest in the firm or subsidiary [or, in the case of a subsidiary, the firm that owns the subsidiary], unless a waiver is granted by the Secretary of Defense.

(c) Disclosure.

The Offeror shall disclose any significant interest the government of each of the following countries has in the Offeror or a subsidiary of the Offeror. If the Offeror is a subsidiary, it shall also disclose any significant interest the government of a terrorist country has in any firm that owns or controls the subsidiary. The disclosure shall include--

(1) Identification of each government holding a significant interest; and

(2) A description of the significant interest held by each Government.

(End of provision)

8. RESERVED

9. (FAR 52.219-1) SMALL BUSINESS PROGRAM REPRESENTATIONS (MAY 2004) ALTERNATE I (APR 2002)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is _____ [*insert NAICS code*].

(2) The small business size standard is _____ [*insert size standard*].

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) *Representations*. (1) The offeror represents as part of its offer that it [ ] is, [ ] is not a small business concern.

(2) [*Complete only if the offeror represented itself as a small business concern in paragraph (b)(1)*

of this provision.] The offeror represents, for general statistical purposes, that it [ ] is, [ ] is not, a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) [*Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision*.] The offeror represents as part of its offer that it [ ] is, [ ] is not a women-owned small business concern.

(4) [*Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision*.] The offeror represents as part of its offer that it [ ] is, [ ] is not a veteran-owned small business concern.

(5) [*Complete only if the offeror represented itself as aveteran-owned small business concern in paragraph (b)(4) of this provision*.] The offeror represents as part of its offer that it [ ] is, [ ] is not a service-disabled veteran-owned small business concern.

(6) *[Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision*.] The offeror represents, as part of its offer, that—

(i) It [ ] is, [ ] is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material change in ownership and control, principal office, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR part 126; and

(ii) It [ ] is, [ ] is not a joint venture that complies with the requirements of 13 CFR part 126, and the representation in paragraph (b)(6)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. [*The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture:*_____.] Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(7) [*Complete if offeror represented itself as disadvantaged in paragraph (b)(2) of this provision.*] The offeror shall check the category in which its ownership falls:

_____ Black American.
_____ Hispanic American.
_____ Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians).
_____ Asian-Pacific American (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China, Taiwan, Laos, Cambodia (Kampuchea),Vietnam, Korea, The Philippines, U.S. Trust Territory of the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, Guam, Samoa, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru).
_____ Subcontinent Asian (Asian-Indian) American (persons with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal).
_____ Individual/concern, other than one of the preceding.

(c) *Definitions*. As used in this provision—

"Service-disabled veteran-owned small business concern"—

(1) Means a small business concern—

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service connected, as defined in 38 U.S.C. 101(16).

"Small business concern" means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR part 121 and the size standard in paragraph (a) of this provision.

"Veteran-owned small business concern" means a small business concern—

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned small business concern" means a small business concern—

(1) That is at least 51 percent owned by one or more women; or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) *Notice*. (1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small, HUBZone small, small disadvantaged, or women-owned small business concern in order to obtain a contract to be awarded under the preference programs established pursuant to section 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall—

(i) Be punished by imposition of fine, imprisonment, or both;

(ii) Be subject to administrative remedies, including suspension and debarment; and

(iii) Be ineligible for participation in programs conducted under the authority of the Act.

(End of provision)

10. RESERVED

11. (FARS 52.219-19) SMALL BUSINESS CONCERN REPRESENTATION FOR THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (OCT 2000).

(a) *Definition*. "Emerging small business" as used in this solicitation, means a small business concern whose size is no greater than 50 percent of the numerical size standard applicable to the North American Industry Classification System (NAICS) code assigned to a contracting opportunity.

(b) (Complete only if Offeror has represented itself under the provision at FAR 52.219-1 as a small business concern under the size standards of this solicitation.) The Offeror [ ] is, [ ] is not an emerging small business.

(c) (Complete only if the Offeror is a small business or an emerging small business, indicating its size range.)

Offeror's number of employees for the past 12 months (check this column if size standard stated in solicitation is expressed in terms of number of employees) or Offeror's average annual gross revenue for the last 3 fiscal years (check this column if size standard stated in solicitation is expressed in terms of annual receipts). (Check one of the following.)

No. of Employees	Average Annual Gross Revenues
_____50 or fewer	_____$1 million or less
_____51 - 100	_____$1,000,001 - $2 million
_____101 - 250	_____$2,000,001 - $3.5 million
_____251 - 500	_____$3,500,001 - $5 million

_____501 - 750	_____$5,000,001 - $10 million
_____751 - 1,000	_____$10,000,001 - $17 million
_____Over 1,000	_____Over $17 million

12. (FARS 52.219-21) SMALL BUSINESS SIZE REPRESENTATION FOR TARGETED INDUSTRY CATEGORIES UNDER THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (MAY 1999).

[*Complete only if the Offeror has represented itself under the provision at 52.219-1 as a small business concern under the size standards of this solicitation*.]

Offeror's number of employees for the past 12 months [*check this column if size standard stated in solicitation is expressed in terms of number of employees*] or Offeror's average annual gross revenue for the last 3 fiscal years [check this column if size standard in solicitation is expressed in terms of annual receipts]. [*Check one of the following.*]

NO. OF EMPLOYEES	AVERAGE ANNUAL GROSS REVENUES
_____50 or fewer	_____$1 million or less
_____51 - 100	_____$1,000,001 - $2 million
_____101 - 250	_____$2,000,001 - $3.5 million
_____251 - 500	_____$3,500,001 - $5 million
_____501 - 750	_____$5,000,001 - $10 million
_____751 - 1,000	_____$10,000,001 - $17 million
_____Over 1,000	_____Over $17 million

13. (FAR 52.222-21) CERTIFICATION OF NONSEGREGATED FACILITIES (FEB 1999).

(a) "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

(b) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

(End of clause)

14. (FAR 52.222-22) PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FEB 1999).

The offeror represents that—

(a) It [ ] has, [ ] has not participated in a previous contract or subcontract subject to the Equal Opportunity clause of this solicitation;

(b) It [ ] has, [ ] has not filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

(End of provision)

15. (FAR 52.223-4) RECOVERED MATERIAL CERTIFICATION (OCT 1997).

As required by the Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6962(c)(3)(A)(i)), the offeror certifies, by signing this offer, that the percentage of recovered materials to be used in the performance of the contract will be at least the amount required by the applicable contract specifications.
(End of provision)

16. (FAR 52.223-13) CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (AUG 2003) [For Contracts over $100,000]

(a) Executive Order 13148, of April 21, 2000, Greening the Government through Leadership in Environmental Management, requires submission of this certification as a prerequisite for contract award.

(b) By signing this offer, the offeror certifies that—

(1) As the owner or operator of facilities that will be used in the performance of this contract that are subject to the filing and reporting requirements described in section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023) and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106), the offeror will file and continue to file for such facilities for the life of the contract the Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of EPCRA and section 6607 of PPA; or

(2) None of its owned or operated facilities to be used in the performance of this contract is subject to the Form R filing and reporting requirements because each such facility is exempt for at least one of the following reasons: [*Chec k each block that is applicable*.]

[ ] (i) The facility does not manufacture, process, or otherwise use any toxic chemicals listed in 40 CFR 372.65;

[ ] (ii) The facility does not have 10 or more fulltime employees as specified in section 313(b)(1)(A) of EPCRA, 42 U.S.C. 11023(b)(1)(A);

[ ] (iii) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

[ ] (iv) The facility does not fall within the following Standard Industrial Classification (SIC) codes or their corresponding North American Industry Classification System sectors:

(A) Major group code 10 (except 1011, 1081, and 1094.

(B) Major group code 12 (except 1241).

(C) Major group codes 20 through 39.

(D) Industry code 4911, 4931, or 4939 (limited to facilities that combust coal and/or oil for the purpose of generating power for distribution in commerce).

(E) Industry code 4953 (limited to facilities regulated under the Resource Conservation and Recovery Act, Subtitle C (42 U.S.C. 6921, *et seq*.), or 5169, or 5171, or 7389 (limited to facilities primarily engaged in solvent recovery services on a contract or fee basis); or

[ ] (v) The facility is not located in the United States or its outlying areas..
(End of provision)

17. (DFARS 252.225-7031) SECONDARY ARAB BOYCOTT OF ISRAEL (APR 2003)

(a) *Definitions.* As used in this provision-

(1) "Foreign person" means any person (including any individual, partnership, corporation, or other form of association) other than a United States person.

(2) "United States person" is defined in 50 U.S.C. App. 2415(2) and means-

(i) Any United States resident or national (other than an individual resident outside the United States who is employed by other than a United States person);

(ii) Any domestic concern (including any permanent domestic establishment of any foreign concern); and

(iii) Any foreign subsidiary or affiliate (including any permanent foreign establishment) of

any domestic concern that is controlled in fact by such domestic concern.

(b) *Certification*. If the offeror is a foreign person, the offeror certifies, by submission of an offer, that it-

(1) Does not comply with the Secondary Arab Boycott of Israel; and

(2) Is not taking or knowingly agreeing to take any action, with respect to the Secondary Boycott of Israel by Arab countries, which 50 U.S.C. App. 2407(a) prohibits a United States person from taking.

(End of Provision)

18. (DFAR 252.247-7022) REPRESENTATION OF EXTENT OF TRANSPORTATION BY SEA (AUG 1992).

(a) The Offeror shall indicate by checking the appropriate blank in paragraph (b) of this provision whether transportation of supplies by sea is anticipated under the resultant contract. The term "supplies" is defined in the Transportation of Supplies by Sea clause of this solicitation.

(b) REPRESENTATION. The Offeror represents that it-

_____ Does anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

_____ Does not anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

(c) Any contract resulting from this solicitation will include the Transportation of Supplies by Sea Clause. If the Offeror represents that it will not use ocean transportation, the resulting contract will also include the Defense FAR Supplement clause at 252.247-7024, Notification of Transportation of Supplies by Sea.

19. CONTRACTOR'S CERTIFICATION (Reference FAR 4.102) (Local Provision)

Offerors are cautioned to note the "Contractor's Certification" included in this solicitation and to furnish the information required by paragraph (b), Partnerships, and paragraph (c), Corporations, as appropriate.

(a) CONTRACT WITH INDIVIDUAL. If the resultant contract is with an individual, it shall be signed by the individual in his own name. A contract with an individual doing business as a firm shall be signed by that individual and will ordinarily take the following form.

_____ (Signed)

An individual doing business as

_____

(b) CONTRACTS WITH PARTNERSHIPS. If the resultant contract is with a partnership, it need be signed by only one partner PROVIDED the partner signing has the authority to legally bind the partnership. In addition, the following statement shall be completed:

_____ is a partnership composed of
(Firm Name)

_____
(List All Partners)

_____
(Indicate if any partner is limited in partnership authority

(c) CONTRACTS WITH CORPORATIONS. If the resultant contract is with a corporation, it shall be executed in the corporation name, followed by the word "by" after which the person who has been authorized to execute the contract on behalf of the corporation shall sign his/her name, with the designation of his/her official capacity. In addition, the following certification shall be completed:

I, _____, certify that I am the _____ of the corporation named as Contractor herein, that _____ who signed this contract on behalf of the Contractor was then _____ of said corporation, that said contract was duly for and on behalf of said corporation by authority of the governing body and is within the scope of its corporate powers.

In witness whereof, I have hereunto affixed my signature this ____ day of _____, 19___.

_____
(Signature, Printed Name, Title)

(d) CONTRACT WITH JOINT VENTURES. If the resultant contract is with a joint venture, each participant shall sign and in the manner indicated above for each type of participant. In addition, to assure a single point of contact for resolution of contractual matters and payments, the following certification shall be signed by each participant in the joint venture.

The parties hereto expressly understand and agree as follows:

(1) _____
(Name) (Title) (Company)

is the principal representative of the joint venture. As such, all communications regarding the administration of the contract and the performance of the work thereunder may be directed to him. In the absence of:

_____
(Name) (Title) (Company as above)

_____
(Name) (Title) (Company of Alternate)

is the alternate principle of the joint venture.

(2) Directions, approvals, required notices, and all other communications from the Government to the joint venture, including transmittal of payments by the Government, shall be directed to:

_____
(Name) (Title) (Company)

principal representative of the joint venture.

(e) SIGNATURE OF AGENTS. If the resultant contract is signed by an agent, other than as stated above, the fact of the agency will be evidenced by a copy of the Power of Attorney.

SECTION 00700

CONTRACT CLAUSES

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SECTION 00700

CONTRACT CLAUSES

1. FAR 52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

http://www.arnet.gov/far

(End of clause)

* - CONTRACT CLAUSES THAT MAY BE INCORPORATED BY REFERENCE

2. DFARS 252.201-7000 CONTRACTING OFFICER'S REPRESENTATIVE (DEC 1991)

(a) Definition.

"Contracting officer's representative" means an individual designated in accordance with subsection 201.602-2 of the Defense Federal Acquisition Regulation Supplement and authorized in writing by the contracting officer to perform specific technical or administrative functions.

(b) If the Contracting Officer designates a contracting officer's representative (COR), the Contractor will receive a copy of the written designation. It will specify the extent of the COR's authority to act on behalf of the contracting officer. The COR is not authorized to make any commitments or changes that will affect price, quality, quantity, delivery, or any other term or condition of the contract.

(End of clause)

3. *FAR 52.202-1 DEFINITIONS (JULY 2004)

(a) When a solicitation provision or contract clause uses a word or term that is defined in the Federal Acquisition Regulation (FAR), the word or term has the same meaning as the definition in FAR 2.101 in effect at the time the solicitation was issued, unless—

(1) The solicitation, or amended solicitation, provides a different definition;

(2) The contracting parties agree to a different definition;

(3) The part, subpart, or section of the FAR where the provision or clause is prescribed provides a different meaning; or

(4) The word or term is defined in FAR Part 31, for use in the cost principles and procedures.

(b) The FAR Index is a guide to words and terms the FAR defines and shows where each definition is located. The FAR Index is available via the Internet at *http://www.acqnet.gov* at the end of the FAR, after the FAR Appendix.

(End of clause)

4. *FAR 52.203-3 GRATUITIES (APR 1984)

(a) The right of the Contractor to proceed may be terminated by written notice if, after notice and hearing, the agency head or a designee determines that the Contractor, its agent, or another representative--

(1) Offered or gave a gratuity (e.g., an entertainment or gift) to an officer, official, or employee of the Government; and

(2) Intended, by the gratuity, to obtain a contract or favorable treatment under a contract.

(b) The facts supporting this determination may be reviewed by any court having lawful jurisdiction.

(c) If this contract is terminated under paragraph (a) above, the Government is entitled--

(1) To pursue the same remedies as in a breach of the contract; and

(2) In addition to any other damages provided by law, to exemplary damages of not less than 3 nor more than 10 times the cost incurred by the Contractor in giving gratuities to the person concerned, as determined by the agency head or a designee. (This subparagraph (c)(2) is applicable only if this contract uses money appropriated to the Department of Defense.)

(d) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

5. *FAR 52.203-5 COVENANT AGAINST CONTINGENT FEES (APR 1984)

(a) The Contractor warrants that no person or agency has been employed or retained to solicit or obtain this contract upon an agreement or understanding for a contingent fee, except a bona fide employee or agency. For breach or violation of this warranty, the Government shall have the right to annul this contract without liability or, in its discretion, to deduct from the contract price or consideration, or otherwise recover, the full amount of the contingent fee.

(b) "Bona fide agency," as used in this clause, means an established commercial or selling agency, maintained by a contractor for the purpose of securing business, that neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds itself out as being able to obtain any Government contract or contracts through improper influence.

"Bona fide employee," as used in this clause, means a person, employed by a contractor and subject to the contractor's supervision and control as to time, place, and manner of performance, who neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds out as being able to obtain any Government contract or contracts through improper influence.

"Contingent fee," as used in this clause, means any commission, percentage, brokerage, or other fee that is contingent upon the success that a person or concern has in securing a Government contract.

"Improper influence," as used in this clause, means any influence that induces or tends to induce a Government employee or officer to give consideration or to act regarding a Government contract on any basis other than the merits of the matter.

6. *FAR 52.203-7 ANTI-KICKBACK PROCEDURES (JUL 1995)

(a) Definitions.

"Kickback," as used in this clause, means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided, directly or indirectly, to any prime Contractor, prime Contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a subcontract relating to a prime contract. "Person," as used in this clause, means a corporation, partnership, business association of any kind, trust, joint-stock company, or individual.

"Prime contract," as used in this clause, means a contract or contractual action entered into by the United States for the purpose of obtaining supplies, materials, equipment, or services of any kind.

"Prime Contractor," as used in this clause, means a person who has entered into a prime contract with the United States.

"Prime Contractor employee," as used in this clause, means any officer, partner, employee, or agent of a prime Contractor.

"Subcontract," as used in this clause, means a contract or contractual action entered into by a prime Contractor or subcontractor for the purpose of obtaining supplies, materials, equipment, or services of any kind under a prime contract.

"Subcontractor," as used in this clause, (1) means any person, other than the prime Contractor, who offers to furnish or furnishes any supplies, materials, equipment, or services of any kind under a prime contract or a subcontract entered into in connection with such prime contract, and (2) includes any person who offers to furnish or furnishes general supplies to the prime Contractor or a higher tier subcontractor.

"Subcontractor employee," as used in this clause, means any officer, partner, employee, or agent of a subcontractor.

(b) The Anti-Kickback Act of 1986 (41 U.S.C. 51-58) (the Act), prohibits any person from--

(1) Providing or attempting to provide or offering to provide any kickback;

(2) Soliciting, accepting, or attempting to accept any kickback; or

(3) Including, directly or indirectly, the amount of any kickback in the contract price charged by a prime Contractor to the United States or in the contract price charged by a subcontractor to a prime Contractor or higher tier subcontractor.

(c) (1) The Contractor shall have in place and follow reasonable procedures designed to prevent and detect possible violations described in paragraph (b) of this clause in its own operations and direct business relationships.

(2) When the Contractor has reasonable grounds to believe that a violation described in paragraph (b) of this clause may have occurred, the Contractor shall promptly report in writing the possible violation. Such reports shall be made to the inspector general of the contracting agency, the head of the contracting agency if the agency does not have an inspector general, or the Department of Justice.

(3) The Contractor shall cooperate fully with any Federal agency investigating a possible violation described in paragraph (b) of this clause.

(4) The Contracting Officer may

(i) offset the amount of the kickback against any monies owed by the United States under the prime contract and/or

(ii) direct that the Prime Contractor withhold from sums owed a subcontractor under the prime contract the amount of the kickback. The Contracting Officer may order that monies withheld under subdivision (c)(4)(ii) of this clause be paid over to the Government unless the Government has already offset those monies under subdivision (c)(4)(i) of this clause. In either case, the Prime Contractor shall notify the Contracting Officer when the monies are withheld.

(5) The Contractor agrees to incorporate the substance of this clause, including subparagraph (c)(5) but excepting subparagraph (c)(1), in all subcontracts under this contract which exceed $100,000.

7. *FAR 52.203-8 CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)

(a) If the Government receives information that a contractor or a person has engaged in conduct constituting a violation of subsection (a), (b), (c), or (d) of Section 27 of the Office of Federal Procurement Policy Act (41 U.S.C. 423) (the Act), as amended by section 4304 of the National Defense Authorization Act for Fiscal Year 1996 (Pub. L. 104-106), the Government may--

(1) Cancel the solicitation, if the contract has not yet been awarded or issued; or

(2) Rescind the contract with respect to which--

(i) The Contractor or someone acting for the Contractor has been convicted for an offense where the conduct constitutes a violation of subsection 27 (a) or (b) of the Act for the purpose of either--

(A) Exchanging the information covered by such subsections for anything of value; or

(B) Obtaining or giving anyone a competitive advantage in the award of a Federal agency procurement contract; or

(ii) The head of the contracting activity has determined, based upon a preponderance of the evidence, that the Contractor or someone acting for the Contractor has engaged in conduct constituting an offense punishable under subsection 27(e)(1) of the Act.

(b) If the Government rescinds the contract under paragraph (a) of this clause, the Government is entitled to recover, in addition to any penalty prescribed by law, the amount expended under the contract.

(c) The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law, regulation, or under this contract.

8. DFARS 252.203-7001 PROHIBITION ON PERSONS CONVICTED OF FRAUD OR OTHER DEFENSE—CONTRACT-RELATED FELONIES (MARCH 1999)

(a) Definitions.

As used in this clause--

(1) "Arising out of a contract with the "DoD" means any any act in connection with--

(i) Attempting to obtain;

(ii) Obtaining; or

(iii) Performing a contract or first-tier subcontract of any department, or component of the Department of Defense (DoD).

(2) "Conviction of fraud or any other felony," means any conviction for fraud or a felony in violation of state or Federal criminal statutes, whether entered on a verdict or plea, including a plea of nolo contendere, for which sentence has been imposed.

(3) "Date of conviction," means the date judgement was entered against the individual.

(b) Any individual who is convicted after September 29, 1988 of fraud or any other felony arising out of a contract with the DoD is prohibited from serving--

(1) In a management or supervisory capacity on any DoD contract or first-tier subcontract;

(2) On board of directors of any DoD Contractor or first-tier subcontractor;

(3) As a consultant to any DoD Contractor or first-tier subcontractor; or

(4) In any other capacity with the authority to influence, advise, or control the decisions of any DoD contractor or subcontractor with regard to any DoD contract or first-tier subcontract.

(c) Unless waived, the prohibition in paragraph (b) of this clause applies for not less than five years from the date of conviction.

(d) 10 U.S.C. 2408 provides that a defense Contractor or first-tier subcontractor shall be subject to a criminal penalty of not more than $500,000 if convicted of knowingly--

(1) Employing a person under a prohibition in paragraph (b) of this clause;

(2) Allowing such a person to serve on the board of directors of Contractor or first-tier subcontractor.

(e) In addition to the criminal penalties contained in 10 U.S.C. 2408, the Government may consider other available remedies, such as--

(1) Suspension or debarment;

(2) Cancellation of the contract at no cost to the Government; or

(3) Termination of the contract for default.

(f) The Contractor may submit written requests for waiver of the prohibition in paragraph (b) of this clause to the Contracting Officer. Requests shall clearly identify--

(1) The person involved;

(2) The nature of the conviction and resultant sentence or punishment imposed;

(3) The reasons for the requested waiver; and

(4) An explanation of why a waiver is in the interest of national security.

(g) The Contractor agrees to include the substance of this clause appropriately modified to reflect the identity and relationship of the parties, in all first-tier subcontracts exceeding the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation, except those for commercial items or components.

(h) Pursuant to 10 U.S.C.2408(c), defense contractors and subcontractors may obtain information as to whether a particular has been convicted of fraud or any other felony arising out of a contract with the DoD by contracting The Office of Justice Programs, The Denial of Federal Benefits Office, U.S. Department of Justice, telephone (202) 616-3507.

9. RESERVED

10. *FAR 52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)

(a) The Government, at its election, may reduce the price of a fixed-price type contract and the total cost and fee under a cost-type contract of profit or fee determined as set forth in paragraph (b) of this clause if the head of the contracting activity or designee determines that there was a violation of subsection 27(a), (b), or (c) of the Office of Federal Procurement Policy Act, as amended (41 U.S.C. 423), as implemented in section 3.104 of the Federal Acquisition Regulation.

(b) The price or fee reduction referred to in paragraph (a) of this clause shall be--

(1) For cost-plus-fixed-fee contracts, the amount of the fee specified in the contract at the time of award;

(2) For cost-plus-incentive-fee contracts, the target fee specified in the contract at the time of award, notwithstanding any minimum fee or "fee floor" specified in the contract;

(3) For cost-plus-award-fee contracts--

(i) The base fee established in the contract at the time of contract award;

(ii) If no base fee is specified in the contract, 30 percent of the amount of each award fee otherwise payable to the Contractor for each award fee evaluation period or at each award fee determination point.

(4) For fixed-price-incentive contracts, the Government may--

(i) Reduce the contract target price and contract target profit both by an amount equal to the initial target profit specified in the contract at the time of contract award; or

(ii) If an immediate adjustment to the contract target price and contract target profit would have a significant adverse impact on the incentive price revision relationship under the contract, or adversely affect the contract financing provisions, the Contracting Officer may defer such adjustment until establishment of the total final price of the contract. The total final price established in accordance with the incentive price revision provisions of the contract shall be reduced by an amount equal to the initial target profit specified in the contract at the time of contract award and such reduced price shall be the total final contract price.

(5) For firm-fixed-price contracts, by 10 percent of the initial contract price or a profit amount determined by the Contracting Officer from records or documents in existence prior to the date of the contract award.

(c) The Government may, at its election, reduce a prime contractor's price or fee in accordance with the procedures of paragraph (b) of this clause for violations of the Act by its subcontractors by an amount not to exceed the amount of profit or fee reflected in the subcontract at the time the subcontract was first definitively priced.

(d) In addition to the remedies in paragraphs (a) and (c) of this clause, the Government may terminate this contract for default. The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law or under this contract.

11. *FAR 52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUNE 2003)

(a) Definitions.

"Agency," as used in this clause, means executive agency as defined in 2.101.

"Covered Federal Action," as used in this clause, means any of the following Federal actions:

(1) The awarding of any Federal contract.

(2) The making of any Federal grant.

(3) The making of any Federal loan.

(4) The entering into of any cooperative agreement.

(5) The extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

"Indian tribe" and "tribal organization," as used in this clause, have the meaning provided in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450B) and include Alaskan Natives.

"Influencing or attempting to influence," as used in this clause, means making, with the intent to influence, any communication to or appearance before an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any covered Federal action.

"Local government," as used in this clause, means a unit of government in a State and, if chartered, established, or otherwise recognized by a State for the performance of a governmental duty, including a local public authority, a special district, an intrastate district, a council of governments, a sponsor group representative organization, and any other instrumentality of a local government.

"Officer or employee of an agency," as used in this clause, includes the following individuals who are employed by an agency:

(1) An individual who is appointed to a position in the Government under title 5, United States Code, including a position under a temporary appointment.

(2) A member of the uniformed services, as defined in subsection 101(3), title 37, United States Code.

(3) A special Government employee, as defined in section 202, title 18, United States Code.

(4) An individual who is a member of a Federal advisory committee, as defined by the Federal Advisory Committee Act, title 5, United States Code, appendix 2.

"Person," as used in this clause, means an individual, corporation, company, association, authority, firm, partnership, society, State and local government, regardless of whether such entity is operated for profit, or not for profit. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Reasonable compensation," as used in this clause, means, with respect to a regularly employed officer or employee of any person, compensation that is consistent with the normal compensation for such officer or employee for work that is not furnished to, not funded by, or not furnished in cooperation with the Federal Government.

"Reasonable payment," as used in this clause, means, with respect to professional and other technical services, a payment in an amount that is consistent with the amount normally paid for such services in the private sector.

"Recipient," as used in this clause, includes the Contractor and all subcontractors. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Regularly employed," as used in this clause, means, with respect to an officer or employee of a person requesting or receiving a Federal contract, an officer or employee who is employed by such person for at least 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person for receipt of such contract. An officer or employee who is employed by such person for less than 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person shall be considered to be regularly employed as soon as he or she is employed by such person for 130 working days.

"State," as used in this clause, means a State of the United States, the District of Columbia, or an outlying area of the United States, an agency or instrumentality of a State, and multi-State, regional, or interstate entity having governmental duties and powers.

(b) Prohibitions.

(1) Section 1352 of title 31, United States Code, among other things, prohibits a recipient of a Federal Contract, grant, loan, or cooperative agreement from using appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: The awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.

(2) The Act also requires Contractors to furnish a disclosure if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of

Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative agreement.

(3) The prohibitions of the Act do not apply under the following conditions:

(i) Agency and legislative liaison by own employees.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of a payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action if the payment is for agency and legislative liaison activities not directly related to a covered Federal action.

(B) For purposes of subdivision (b)(3)(i)(A) of this clause, providing any information specifically requested by an agency or Congress is permitted at any time.

(C) The following agency and legislative liaison activities are permitted at any time where they are not related to a specific solicitation for any covered Federal action:

(1) Discussing with an agency the qualities and characteristics (including individual demonstrations) of the person's products or services, conditions or terms of sale, and service capabilities.

(2) Technical discussions and other activities regarding the application or adaptation of the person's products or services for an agency's use.

(D) The following agency and legislative liaison activities are permitted where they are prior to formal solicitation of any covered Federal action--

(1) Providing any information not specifically requested but necessary for an agency to make an informed decision about initiation of a covered Federal action;

(2) Technical discussions regarding the preparation of an unsolicited proposal prior to its official submission; and

(3) Capability presentations by persons seeking awards from an agency pursuant to the provisions of the Small Business Act, as amended by Pub. L. 95-507, and subsequent amendments.

(E) Only those services expressly authorized by subdivision (b)(3)(i)(A) of this clause are permitted under this clause.

(ii) Professional and technical services.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of--

(1) A payment of reasonable compensation made to an officer or employee f a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action, if payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action.

(2) Any reasonable payment to a person, other than an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action if the payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action. Persons other than officers or employees of a person requesting or receiving a covered Federal action include consultants and trade associations.

(B) For purposes of subdivision (b)(3)(ii)(A) of this clause, "professional and technical services" shall be limited to advice and analysis directly applying any professional or technical discipline. For example, drafting of a legal document accompanying a bid or proposal by a lawyer is allowable. Similarly, technical advice provided by an engineer on the performance or operational capability of a piece of equipment rendered directly in the negotiation of a contract is allowable. However, communications with the intent to influence made by a professional (such as a licensed lawyer) or a technical person (such as a licensed accountant) are not allowable under this section unless they provide advice and analysis directly applying their professional or technical expertise and unless the advice or analysis is rendered directly and solely in the preparation, submission or negotiation of a covered Federal action. Thus, for example, communications with the intent to influence made by a lawyer that do not provide legal advice or analysis directly and solely related to the legal aspects of his or her client's proposal, but generally advocate one proposal over another are not allowable under this section because the lawyer

is not providing professional legal services. Similarly, communications with the intent to influence made by an engineer providing an engineering analysis prior to the preparation or submission of a bid or proposal are not allowable under this section since the engineer is providing technical services but not directly in the preparation, submission or negotiation of a covered Federal action.

(C) Requirements imposed by or pursuant to law as a condition for receiving a covered Federal award include those required by law or regulation and any other requirements in the actual award documents.

(D) Only those services expressly authorized by subdivisions (b)(3)(ii)(A)(1) and (2) of this clause are permitted under this clause.

(E) The reporting requirements of FAR 3.803(a) shall not apply with respect to payments of reasonable compensation made to regularly employed officers or employees of a person.

(iii) Disclosure.

(A) The Contractor who requests or receives from an agency a Federal contract shall file with that agency a disclosure form, OMB standard form LLL, Disclosure of Lobbying Activities, if such person has made or has agreed to make any payment using nonappropriated funds (to include profits from any covered Federal action), which would be prohibited under subparagraph (b)(1) of this clause, if paid for with appropriated funds.

(B) The Contractor shall file a disclosure form at the end of each calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under subparagraph (c)(1) of this clause. An event that materially affects the accuracy of the information reported includes--

(1) A cumulative increase of $25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or

(2) A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or

(3) A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

(C) The Contractor shall require the submittal of a certification, and if required, a disclosure form by any person who requests or receives any subcontract exceeding $100,000 under the Federal contract.

(D) All subcontractor disclosure forms (but not certifications) shall be forwarded from tier to tier until received by the prime Contractor. The prime Contractor shall submit all disclosures to the Contracting Officer at the end of the calendar quarter in which the disclosure form is submitted by the subcontractor. Each subcontractor certification shall be retained in the subcontract file of the awarding Contractor.

(iv) Agreement. The Contractor agrees not to make any payment prohibited by this clause.

(v) Penalties.

(A) Any person who makes an expenditure prohibited under paragraph (a) of this clause or who fails to file or amend the disclosure form to be filed or amended by paragraph (b) of this clause shall be subject to civil penalties as provided for by 31 U.S.C. 1352. An imposition of a civil penalty does not prevent the Government from seeking any other remedy that may be applicable.

(B) Contractors may rely without liability on the representation made by their subcontractors in the certification and disclosure form.

(vi) Cost allowability. Nothing in this clause makes allowable or reasonable any costs which would otherwise be unallowable or unreasonable. Conversely, costs made specifically unallowable by the requirements in this clause will not be made allowable under any other provision.

12. DFARS 252.203-7002 DISPLAY OF DOD HOTLINE POSTER (DEC 1991)
(<u>For Military Contracts Exceeding $5,000,000</u>)

(a) The Contractor shall display prominently in common work areas within business segments performing work under Department of Defense (DoD) contracts, DoD Hotline Posters prepared by DoD Office of the Inspector General.

(b) DoD Hotline Posters may be obtained from the DoD Inspector General, ATTN: Defense Hotline, 400 Army Navy Drive, Washington DC 22202-2884.

(c) The Contract need not comply with paragraph (a) of this clause if it has established a mechanism, such as a hotline, by which employees may report suspected instances of improper conduct, and instructions that encourage employees to make such reports.

13. *FAR 52.204-4 PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER (AUG 2000)

(a) Definitions. As used in this clause—

"Postconsumer material" means a material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item. Postconsumer material is a part of the broader category of "recovered material." For paper and paper products, postconsumer material means "postconsumer fiber" defined by the U.S. Environmental Protection Agency (EPA) as—

(1) Paper, paperboard, and fibrous materials from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage; or

(2) All paper, paperboard, and fibrous materials that enter and are collected from municipal solid waste; but not

(3) Fiber derived from printers' over-runs, converters' scrap, and over-issue publications.

"Printed or copied double-sided" means printing or reproducing a document so that information is on both sides of a sheet of paper.

"Recovered material," for paper and paper products, is defined by EPA in its Comprehensive Procurement Guideline as "recovered fiber" and means the following materials:

(1) Postconsumer fiber; and

(2) Manufacturing wastes such as—

(i) Dry paper and paperboard waste generated after completion of the papermaking process (that is, those manufacturing operations up to and including the cutting and trimming of the paper machine reel into smaller rolls or rough sheets) including: envelope cuttings, bindery trimmings, and other paper and paperboard waste resulting from printing, cutting, forming, and other converting operations; bag, box, and carton manufacturing wastes; and butt rolls, mill wrappers, and rejected unused stock; and

(ii) Repulped finished paper and paperboard from obsolete inventories of paper and paperboard manufacturers, merchants, wholesalers, dealers, printers, converters, or others.

(b) In accordance with Section 101 of Executive Order 13101 of September 14, 1998, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition, the Contractor is encouraged to submit paper documents, such as offers, letters, or reports, that are printed or copied double-sided on recycled paper that meet minimum content standards specified in Section 505 of Executive Order 13101, when not using electronic commerce methods to submit information or data to the Government.

(c) If the Contractor cannot purchase high-speed copier paper, offset paper, forms bond, computer printout paper, carbonless paper, file folders, white wove envelopes, writing and office paper, book paper, cotton fiber paper, and cover stock meeting the 30 percent postconsumer material standard for use in submitting paper documents to the Government, it should use paper containing no less than 20 percent postconsumer material. This lesser standard should be used only when paper meeting the 30 percent postconsumer material standard is not obtainable at a reasonable price or does not meet reasonable performance standards.

(End of clause)

14. *FAR 52.204-7 CENTRAL CONTRACTOR REGISTRATION (OCT 2003)

(a) Definitions. As used in this clause—

"Central Contractor Registration (CCR) database" means the primary Government repository for Contractor information required for the conduct of business with the Government.

"Data Universal Numbering System (DUNS) number" means the 9-digit number assigned by Dun and Bradstreet, Inc. (D&B) to identify unique business entities.

"Data Universal Numbering System +4 (DUNS+4) number" means the DUNS number assigned by D&B plus a 4-character suffix that may be assigned by a business concern. (D&B has no affiliation with this 4-character suffix.) This 4-character suffix may be assigned at the discretion of the business concern to establish additional CCR records for identifying alternative Electronic Funds Transfer (EFT) accounts (see the FAR at Subpart 32.11) for the same parent concern.

"Registered in the CCR database" means that—

(1) The Contractor has entered all mandatory information, including the DUNS number or the DUNS+4 number, into the CCR database; and
(2) The Government has validated all mandatory data fields and has marked the record "Active".

(b)(1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee shall be registered in the CCR database prior to award, during performance, and through final payment of any contract, basic agreement, basic ordering agreement, or blanket purchasing agreement resulting from this solicitation.

(2) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation "DUNS" or "DUNS +4" followed by the DUNS or DUNS +4 number that identifies the offeror's name and address exactly as stated in the offer. The DUNS number will be used by the Contracting Officer to verify that the offeror is registered in the CCR database.

(c) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one.
(1) An offeror may obtain a DUNS number—
(i) If located within the United States, by calling Dun and Bradstreet at 1-866-705-5711 or via the Internet at *http://www.dnb.com*; or
(ii) If located outside the United States, by contacting the local Dun and Bradstreet office.

(2) The offeror should be prepared to provide the following information:
(i) Company legal business.
(ii) Tradestyle, doing business, or other name by which your entity is commonly recognized.
(iii) Company Physical Street Address, City, State, and Zip Code.
(iv) Company Mailing Address, City, State and Zip Code (if separate from physical).
(v) Company Telephone Number.
(vi) Date the company was started.
(vii) Number of employees at your location.
(viii) Chief executive officer/key manager.
(ix) Line of business (industry).
(x) Company Headquarters name and address (reporting relationship within your entity).

(d) If the Offeror does not become registered in the CCR database in the time prescribed by the Contracting Officer, the Contracting Officer will proceed to award to the next otherwise successful registered Offeror.

(e) Processing time, which normally takes 48 hours, should be taken into consideration when registering.

Offerors who are not registered should consider applying for registration immediately upon receipt of this solicitation.

(f) The Contractor is responsible for the accuracy and completeness of the data within the CCR database, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the CCR database after the initial registration, the Contractor is required to review and update on an annual basis from the date of initial registration or subsequent updates its information in the CCR database to ensure it is current, accurate and complete. Updating information in the CCR does not alter the terms and conditions of this contract and is not a substitute for a properly executed contractual document.

(g) (1) (i) If a Contractor has legally changed its business name, "doing business as" name, or division name (whichever is shown on the contract), or has transferred the assets used in performing the contract, but has not completed the necessary requirements regarding novation and change-of name agreements in Subpart 42.12, the Contractor shall provide the responsible Contracting Officer a minimum of one business day's written notification of its intention to (A) change the name in the CCR database; (B) comply with the requirements of Subpart 42.12 of the FAR; and (C) agree in writing to the timeline and procedures specified by the responsible Contracting Officer. The Contractor must provide with the notification sufficient documentation to support the legally changed name.

(ii) If the Contractor fails to comply with the requirements of paragraph (g)(1)(i) of this clause, or fails to perform the agreement at paragraph (g)(1)(i)(C) of this clause, and, in the absence of a properly executed novation or change-of name agreement, the CCR information that shows the Contractor to be other than the Contractor indicated in the contract will be considered to be incorrect information within the meaning of the "Suspension of Payment" paragraph of the electronic funds transfer (EFT) clause of this contract.

(2) The Contractor shall not change the name or address for EFT payments or manual payments, as appropriate, in the CCR record to reflect an assignee for the purpose of assignment of claims (see FAR Subpart 32.8, Assignment of Claims). Assignees shall be separately registered in the CCR database. Information provided to the Contractor's CCR record that indicates payments, including those made by EFT, to an ultimate recipient other than that Contractor will be considered to be incorrect information within the meaning of the "Suspension of payment" paragraph of the EFT clause of this contract.

(h) Offerors and Contractors may obtain information on registration and annual confirmation requirements via the internet at *http://www.ccr.gov* or by calling 1-888-227-2423, or 269-961-5757.
(End of clause)

15. DFARS 252.204-7003 CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT (APR 1992)

The Contractor's procedures for protecting against unauthorized disclosure of information shall not require Department of Defense employees or members of the Armed Forces to relinquish control of their work products, whether classified or not, to the Contractor.

16. DFARS 252.204-7004 ALTERNATE A (NOV 2003)

As prescribed in 204.1104, substitute the following paragraph (a) for paragraph (a) of the clause at FAR 52.204-7:

(a) *Definitions*. As used in this clause--

"Central Contractor Registration (CCR) database" means the primary Government repository for contractor information required for the conduct of business with the Government.

"Commercial and Government Entity (CAGE) code" means-

(1) A code assigned by the Defense Logistics Information Service (DLIS) to identify a commercial or Government entity; or

(2) A code assigned by a member of the North Atlantic Treaty Organization that DLIS records and maintains in the CAGE master file. This type of code is known as an "NCAGE code."

"Data Universal Numbering System (DUNS) number" means the 9-digit number assigned by Dun and Bradstreet, Inc. (D&B) to identify unique business entities.

"Data Universal Numbering System +4 (DUNS+4) number" means the DUNS number assigned by D&B plus a 4-character suffix that may be assigned by a business concern. (D&B has no affiliation with this 4-character suffix.) This 4-character suffix may be assigned at the discretion of the business concern to establish additional CCR records for identifying alternative Electronic Funds Transfer (EFT) accounts (see Subpart 32.11 of the Federal Acquisition Regulation) for the same parent concern.

"Registered in the CCR database" means that-

(1) The Contractor has entered all mandatory information, including the DUNS number or the DUNS+4 number, into the CCR database;

(2) The Contractor's CAGE code is in the CCR database; and

(3) The Government has validated all mandatory data fields and has marked the records "Active."

17. *FAR 52.209-6 PROTECTING THE GOVERNMENTS INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (JUL 1995)

(a) The Government suspends or debars Contractors to protect the Government's interests. The Contractor shall not enter into any subcontract in excess of $25,000 with a Contractor that is debarred, suspended, or proposed for debarment unless there is a compelling reason to do so.

(b) The Contractor shall require each proposed first-tier subcontractor, whose subcontract will exceed $25,000, to disclose to the Contractor, in writing, whether as of the time of award of the subcontract, the subcontractor, or its principals, is or is not debarred, suspended, or proposed for debarment by the Federal Government.

(c) A corporate office or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is debarred, suspended, or proposed for debarment (see FAR 9.404 for information on the List of Parties Excluded from Procurement Programs). The notice must include the following:

(1) The name of the subcontractor.

(2) The Contractor's knowledge of the reasons for the subcontractor being on the List of Parties Excluded from Procurement Programs.

(3) The compelling reason(s) for doing business with the subcontractor notwithstanding its inclusion on the List of Parties Excluded From Procurement Programs.

(4) The systems and procedures the Contractor has established to ensure that it is fully protecting the Government's interests when dealing with such subcontractor in view of the specific basis for the party's debarment, suspension, or proposed debarment.

18. DFARS 252.209-7004 SUBCONTRACTING WITH FIRMS THAT ARE OWNED OR CONTROLLED BY THE GOVERNMENT OF A TERRORIST COUNTY (MAR 1998)

(a) Unless the Government determines that there is a compelling reason to do so, the Contractor shall not enter into any subcontract in excess of $25,000 with a firm, or a subsidiary of a firm, that is identified, on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs, as being ineligible for the award of Defense contracts or subcontracts because it is owned or controlled by the government of a terrorist country.

(b) A corporate officer or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is identified, on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs, as being ineligible for the award of Defense contracts or subcontracts because it is owned or controlled by the government of a terrorist country. The notice must include the name of the proposed subcontractor and the compelling reason(s) for doing business with the subcontractor notwithstanding its inclusion on the List of Parties Excluded From Federal Procurement and Nonprocurement Programs.

(End of clause)

19. *FAR 52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (SEP 1990) [For Military Contract's Only]

This is a rated order certified for national defense use, and the Contractor shall follow all the requirements of the Defense Priorities and Allocations System regulation (15 CFR 700).

20. FAR 52.211-18 VARIATION IN ESTIMATED QUANTITY (APR 1984)

If the quantity of a unit-priced item in this contract is an estimated quantity and the actual quantity of the unit-priced item varies more than 15 percent above or below the estimated quantity, an equitable adjustment in the contract price shall be made upon demand of either party. The equitable adjustment shall be based upon any increase or decrease in costs due solely to the variation above 115 percent or below 85 percent of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the Contractor may request, in writing, an extension of time, to be received by the Contracting Officer within 10 days from the beginning of the delay, or within such further period as may be granted by the Contracting Officer before the date of final settlement of the contract. Upon the receipt of a written request for an extension, the Contracting Officer shall ascertain the facts and make an adjustment for extending the completion date as, in the judgement of the Contracting Officer, is justified.

21. *FAR 52.215-2 AUDIT AND RECORDS-NEGOTIATION (JUNE 1999)

(a) As used in this clause, "records" includes books, documents, accounting procedures and practices, and other data, regardless of type and regardless of whether such items are in written form, in the form of computer data, or in any other form.

(b) Examination of costs. If this is a cost-reimbursement, incentive, time-and-materials, labor-hour, or price redeterminable contract, or any combination of these, the Contractor shall maintain and the Contracting Officer, or an authorized representative of the Contracting Officer, shall have the right to examine and audit all records and other evidence sufficient to reflect properly all costs claimed to have been incurred or anticipated to be incurred directly or indirectly in performance of this contract. This right of examination shall include inspection at all reasonable times of the Contractor's plants, or parts of them, engaged in performing the contract.

(c) Cost or pricing data. If the Contractor has been required to submit cost or pricing data in connection with any pricing action relating to this contract, the Contracting Officer, or an authorized representative of the Contracting Officer, in order to evaluate the accuracy, completeness, and currency of the cost or pricing data, shall have the right to examine and audit all of the Contractor's records, including computations and projections, related to--

(1) The proposal for the contract, subcontract, or modification;

(2) The discussions conducted on the proposal(s), including those related to negotiating;

(3) Pricing of the contract, subcontract, or modification; or

(4) Performance of the contract, subcontract or modification.

(d) Comptroller General--(1) The Comptroller General of the United States, or an authorized representative, shall have access to and the right to examine any of the Contractor's directly pertinent records involving transactions related to this contract or a subcontract hereunder.

(2) This paragraph may not be construed to require the Contractor or subcontractor to create or maintain any record that the Contractor or subcontractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e) Reports. If the Contractor is required to furnish cost, funding, or performance reports, the Contracting Officer or an authorized representative of the Contracting Officer shall have the right to examine and audit the supporting records and materials, for the purpose of evaluating--

(1) The effectiveness of the Contractor's policies and procedures to produce data compatible with the objectives of these reports; and

(2) The data reported.

(f) Availability. The Contractor shall make available at its office at all reasonable times the records, materials, and other evidence described in paragraphs (a), (b), (c), (d), and (e) of this clause, for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in Subpart 4.7, Contractor Records Retention, of the Federal Acquisition Regulation (FAR), or for any longer period required by statute or by other clauses of this contract. In addition--

(1) If this contract is completely or partially terminated, the Contractor shall make available the records relating to the work terminated until 3 years after any resulting final termination settlement; and

(2) The Contractor shall make available records relating to appeals under the Disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.

(g) The Contractor shall insert a clause containing all the terms of this clause, including this paragraph (g), in all subcontracts under this contract that exceed the simplified acquisition threshold, and--

(1) That are cost-reimbursement, incentive, time-and-materials, labor-hour, or price-redeterminable type or any combination of these;

(2) For which cost or pricing data are required; or

(3) That require the subcontractor to furnish reports as discussed in paragraph (e) of this clause.

The clause may be altered only as necessary to identify properly the contracting parties and the Contracting Officer under the Government prime contract.

(End of clause)

22. *FAR 52.215-10 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA (OCT 1997)

(a) If any price, including profit or fee, negotiated in connection with this contract, or any cost reimbursable under this contract, was increased by any significant amount because--

(1) The Contractor or a subcontractor furnished cost or pricing data that were not complete, accurate, and current as certified in its Certificate of Current Cost or Pricing Data;

(2) A subcontractor or prospective subcontractor furnished the Contractor cost or pricing data that were not complete, accurate, and current as certified in the Contractor's Certificate of Current Cost or Pricing Data; or

(3) Any of these parties furnished data of any description that were not accurate, the price or cost shall be reduced accordingly and the contract shall be modified to reflect the reduction.

(b) Any reduction in the contract price under paragraph (a) of this clause due to defective data from a prospective subcontractor that was not subsequently awarded the subcontract shall be limited to the amount, plus applicable overhead and profit markup, by which--

(1) The actual subcontract; or

(2) The actual cost to the Contractor, if there was no subcontract, was less than the prospective subcontract cost estimate submitted by the Contractor; provided, that the actual subcontract price was not itself affected by defective cost or pricing data.

(c)(1) If the Contracting Officer determines under paragraph (a) of this clause that a price or cost reduction should be made, the Contractor agrees not to raise the following matters as a defense:

(i) The Contractor or subcontractor was a sole source supplier or otherwise was in a superior bargaining position and thus the price of the contract would not have been modified even if accurate, complete, and current cost or pricing data had been submitted.

(ii) The Contracting Officer should have known that the cost or pricing data in issue were defective even though the Contractor or subcontractor took no affirmative action to bring the character of the data to the attention of the Contracting Officer.

(iii) The contract was based on an agreement about the total cost of the contract and there was no agreement about the cost of each item procured under the contract.

(iv) The Contractor or subcontractor did not submit a Certificate of Current Cost or Pricing Data.

(2)(i) Except as prohibited by subdivision (c)(2)(ii) of this clause, an offset in an amount determined appropriate by the (2)(i) Except as prohibited by subdivision (c)(2)(ii) of this clause, an offset in an amount determined appropriate by the Contracting Officer based upon the facts shall be allowed against the amount of a contract price reduction if--

(A) The Contractor certifies to the Contracting Officer that, to the best of the Contractor's knowledge and belief, the Contractor is entitled to the offset in the amount requested; and

(B) The Contractor proves that the cost or pricing data were available before the "as of" date specified on its Certificate of Current Cost or Pricing Data, and that the data were not submitted before such date.

(ii) An offset shall not be allowed if--

(A) The understated data were known by the Contractor to be understated before the "as of" date specified on its Certificate of Current Cost or Pricing Data; or

(B) The Government proves that the facts demonstrate that the contract price would not have increased in the amount to be offset even if the available data had been submitted before the "as of" date specified on its Certificate of Current Cost or Pricing Data.

(d) If any reduction in the contract price under this clause reduces the price of items for which payment was made prior to the date of the modification reflecting the price reduction, the Contractor shall be liable to and shall pay the United States at the time such overpayment is repaid--

(1) Simple interest on the amount of such overpayment to be computed from the date(s) of overpayment to the Contractor to the date the Government is repaid by the Contractor at the applicable underpayment rate effective for each quarter prescribed by the Secretary of the Treasury under 26 U.S.C. 6621(a)(2); and

(2) A penalty equal to the amount of the overpayment, if the Contractor or subcontractor knowingly submitted cost or pricing data that were incomplete, inaccurate, or noncurrent.

(End of clause)

23. *FAR 52.215-12 SUBCONTRACTOR COST OR PRICING DATA (OCT 1997)

(a) Before awarding any subcontract expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4, on the date of agreement on price or the date of award, whichever is later; or before pricing any subcontract modification involving a pricing adjustment expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4, the Contractor shall require the subcontractor to submit cost or pricing data (actually or by specific identification in writing), unless an exception under FAR 15.403-1 applies.

(b) The Contractor shall require the subcontractor to certify in substantially the form prescribed in FAR 15.406-2 that, to the best of its knowledge and belief, the data submitted under paragraph (a) of this clause were accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract modification.

(c) In each subcontract that exceeds the threshold for submission of cost or pricing data at FAR 15.403-4, when entered into, the Contractor shall insert either--

(1) The substance of this clause, including this paragraph (c), if paragraph (a) of this clause requires submission of cost or pricing data for the subcontract; or

(2) The substance of the clause at FAR 52.215-13, Subcontractor Cost or Pricing Data--Modifications.

(End of clause)

24. *FAR 52.215-15 PENSION ADJUSTMENTS AND ASSET REVERSIONS (JAN 2004)

(a) The Contractor shall promptly notify the Contracting Officer in writing when it determines that it will terminate a defined-benefit pension plan or otherwise recapture such pension fund assets.

(b) For segment closings, pension plan terminations, or curtailment of benefits, the amount of the adjustment shall be—

(1) For contracts and subcontracts that are subject to full coverage under the Cost Accounting Standards (CAS) Board rules and regulations (48 CFR Chapter 99), the amount measured, assigned, and allocated in

accordance with 48 CFR 9904.413-50(c)(12); and

(2) For contracts and subcontracts that are not subject to full coverage under the CAS, the amount measured, assigned, and allocated in accordance with 48 CFR 9904.413-50(c)(12), except the numerator of the fraction at 48 CFR 904.413-50(c)(12)(vi) shall be the sum of the pension plan costs allocated to all non-CAS covered contracts and subcontracts that are subject to Federal Acquisition Regulation (FAR) Subpart 31.2 or for which cost or pricing data were submitted.

(c) For all other situations where assets revert to the Contractor, or such assets are constructively received by it for any reason, the Contractor shall, at the Government's option, make a refund or give a credit to the Government for its equitable share of the gross amount withdrawn. The Government's equitable share shall reflect the Government's participation in pension costs through those contracts for which cost or pricing data were submitted or that are subject to FAR Subpart 31.2.

(d) The Contractor shall include the substance of this clause in all subcontracts under this contract that meet the applicability requirement of FAR 15.408(g).

(End of clause)

25. *FAR 52.215-16 FACILITIES CAPITAL COST OF MONEY (JUNE 2003)

(a) Facilities capital cost of money will be an allowable cost under the contemplated contract, if the criteria for allowability in FAR 31.205-10(b) are met. One of the allowability criteria requires the prospective contractor to propose facilities capital cost of money in its offer.

(b) If the prospective Contractor does not propose this cost, the resulting contract will include the clause Waiver of Facilities Capital Cost of Money.

(End of provision)

26. *FAR 52.215-17 WAIVER OF FACILITIES CAPITAL COST OF MONEY (OCT 1997)

The Contractor did not include facilities capital cost of money as a proposed cost of this contract. Therefore, it is an unallowable cost under this contract.

(End of clause)

27. *FAR 52.215-18 REVERSION OR ADJUSTMENT OF PLANS FOR POST RETIREMENT BENEFITS (PRB) OTHER THAN PENSIONS (OCT 1997)

The Contractor shall promptly notify the Contracting Officer in writing when it determines that it will terminate or reduce a PRB plan. If PRB fund assets revert, or inure, to the Contractor or are constructively received by it under a plan termination or otherwise, the Contractor shall make a refund or give a credit to the Government for its equitable share as required by FAR 31.205-6(o)(6). The Contractor shall include the substance of this clause in all subcontracts under this contract that meet the applicability requirements of FAR 15.408(j).

(End of clause)

28. *FAR 52.219-4 NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS (JAN 1999)

(a) *Definition*. "HUBZone small business concern," as used in this clause, means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business

Administration.

(b) *Evaluation preference*. (1) Offers will be evaluated by adding a factor of 10 percent to the price of all offers, except—

(i) Offers from HUBZone small business concerns that have not waived the evaluation preference;

(ii) Otherwise successful offers from small business concerns;

(iii) Otherwise successful offers of eligible products under the Trade Agreements Act when the dollar threshold for application of the Act is exceeded (see 25.402 of the Federal Acquisition Regulation (FAR)); and

(iv) Otherwise successful offers where application of the factor would be inconsistent with a Memorandum of Understanding or other international agreement with a foreign government.

(2) The factor of 10 percent shall be applied on a line item basis or to any group of items on which award may be made. Other evaluation factors described in the solicitation shall be applied before application of the factor.

(3) A concern that is both a HUBZone small business concern and a small disadvantaged business concern will receive the benefit of both the HUBZone small business price evaluation preference and the small disadvantaged business price evaluation adjustment (see FAR clause 52.219-23). Each applicable price evaluation preference or adjustment shall be calculated independently against an offeror's base offer. These individual preference amounts shall be added together to arrive at the total evaluated price for that offer.

(c) *Waiver of evaluation preference*. A HUBZone small business concern may elect to waive the evaluation preference, in which case the factor will be added to its offer for evaluation purposes. The agreements in paragraph (d) of this clause do not apply if the offeror has waived the evaluation preference.

[ ] Offeror elects to waive the evaluation preference.

(d) *Agreement*. A HUBZone small business concern agrees that in the performance of the contract, in the case of a contract for—

(1) Services (except construction), at least 50 percent of the cost of personnel for contract performance will be spent for employees of the concern or employees of other HUBZone small business concerns;

(2) Supplies (other than procurement from a nonmanufacturer of such supplies), at least 50 percent of the cost of manufacturing, excluding the cost of materials, will be performed by the concern or other HUBZone small business concerns;

(3) General construction, at least 15 percent of the cost of the contract performance incurred for personnel will be will be spent on the concern's employees or the employees of other HUBZone small business concerns; or

(4) Construction by special trade contractors, at least 25 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns.

(e) A HUBZone joint venture agrees that in the performance of the contract, the applicable percentage specified in paragraph (d) of this clause will be performed by the HUBZone small business participant or participants.

(f) A HUBZone small business concern nonmanufacturer agrees to furnish in performing this contract only end items manufactured or produced by HUBZone small business manufacturer concerns. This paragraph does not apply in connection with construction or service contracts.

(End of clause)

29. *FAR 52.219-8 UTILIZATION OF SMALL BUSINESS CONCERNS (MAY 2004)

(a) It is the policy of the United States that small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns shall have the maximum practicable opportunity to participate in performing contracts let by any Federal agency, including contracts and subcontracts for subsystems, assemblies, components, and related services for major systems. It is further the policy of the United States that its prime contractors establish procedures to ensure the timely payment of amounts due pursuant to the

terms of their subcontracts with small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns.

(b) The Contractor hereby agrees to carry out this policy in the awarding of subcontracts to the fullest extent consistent with efficient contract performance. The Contractor further agrees to cooperate in any studies or surveys as may be conducted by the United States Small Business Administration or the awarding agency of the United States as may be necessary to determine the extent of the Contractor 's compliance with this clause.

(c) *Definitions*. As used in this contract—

"HUBZone small business concern" means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration .

"Service-disabled veteran-owned small business concern " —

(1) Means a small business concern—

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

"Small business concern" means a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto.

"Small disadvantaged business concern" means a small business concern that represents, as part of its offer that—

(1) It has received certification as a small disadvantaged business concern consistent with 13 CFR part 124, Subpart B;

(2) No material change in disadvantaged ownership and control has occurred since its certification;

(3) Where the concern is owned by one or more individuals, the net worth of each individual upon whom the certification is based does not exceed $750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); and

(4) It is identified, on the date of its representation, as a certified small disadvantaged business in the database maintained by the Small Business Administration (PRO-Net).

"Veteran-owned small business concern" means a small business concern—

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned small business concern" means a small business concern—

(1) That is at least 51 percent owned by one or more women, or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) Contractors acting in good faith may rely on written representations by their subcontractors regarding their status as a small business concern, a veteran-owned small business concern, a service-disabled veteran-owned small business concern, a HUBZone small business concern, a small disadvantaged business concern, or a women-owned small business concern.

(End of clause)

30. *FAR 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (JAN 2002) [<u>When Contracting By Negotiations</u>]

(a) This clause does not apply to small business concerns.

(b) *Definitions*. As used in this clause—

"Commercial item" means a product or service that satisfies the definition of commercial item in section 2.101 of the Federal Acquisition Regulation.

"Commercial plan" means a subcontracting plan (including goals) that covers the offeror's fiscal year and that applies to the entire production of commercial items sold by either the entire company or a portion thereof (*e.g.*, division, plant, or product line).

"Individual contract plan" means a subcontracting plan that covers the entire contract period (including option periods), applies to a specific contract, and has goals that are based on the offeror's planned subcontracting in support of the specific contract, except that indirect costs incurred for common or joint purposes may be allocated on a prorated basis to the contract.

"Master plan" means a subcontracting plan that contains all the required elements of an individual contract plan, except goals, and may be incorporated into individual contract plans, provided the master plan has been approved.

"Subcontract" means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime Contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

(c) The offeror, upon request by the Contracting Officer, shall submit and negotiate a subcontracting plan, where applicable, that separately addresses subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business concerns, small disadvantaged business, and women-owned small business concerns. If the offeror is submitting an individual contract plan, the plan must separately address subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns, with a separate part for the basic contract and separate parts for each option (if any). The plan shall be included in and made a part of the resultant contract. The subcontracting plan shall be negotiated within the time specified by the Contracting Officer. Failure to submit and negotiate the subcontracting plan shall make the offeror ineligible for award of a contract.

(d) The offeror's subcontracting plan shall include the following:

(1) Goals, expressed in terms of percentages of total planned subcontracting dollars, for the use of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns as subcontractors. The offeror shall include all subcontracts that contribute to contract performance, and may include a proportionate share of products and services that are normally allocated as indirect costs.

(2) A statement of—

(i) Total dollars planned to be subcontracted for an individual contract plan; or the offeror's total projected sales, expressed in dollars, and the total value of projected subcontracts to support the sales for a commercial plan;

(ii) Total dollars planned to be subcontracted to small business concerns;

(iii) Total dollars planned to be subcontracted to veteran-owned small business concerns;

(iv) Total dollars planned to be subcontracted to service-disabled veteran-owned small business;

(v) Total dollars planned to be subcontracted to HUBZone small business concerns;

(vi) Total dollars planned to be subcontracted to small disadvantaged business concerns; and

(vii) Total dollars planned to be subcontracted to women-owned small business concerns.

(3) A description of the principal types of supplies and services to be subcontracted, and an identification of the types planned for subcontracting to—

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(4) A description of the method used to develop the subcontracting goals in paragraph (d)(1) of this clause.

(5) A description of the method used to identify potential sources for solicitation purposes (*e.g.*, existing company source lists, the Procurement Marketing and Access Network (PRO-Net) of the Small Business Administration (SBA), veterans service organizations, the National Minority Purchasing Council Vendor Information Service, the Research and Information Division of the Minority Business Development Agency in the Department of Commerce, or small, HUBZone, small disadvantaged, and women-owned small business trade associations). A firm may rely on the information contained in PRO-Net as an accurate representation of a concern's size and ownership characteristics for the purposes of maintaining a small, veteran-owned small, service-disabled veteran-owned small, HUBZone small, small disadvantaged, and women-owned small business source list. Use of PRONet as its source list does not relieve a firm of its responsibilities (*e.g.*, outreach, assistance, counseling, or publicizing subcontracting opportunities) in this clause.

(6) A statement as to whether or not the offeror included indirect costs in establishing subcontracting goals, and a description of the method used to determine the proportionate share of indirect costs to be incurred with—

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(7) The name of the individual employed by the offeror who will administer the offeror's subcontracting program, and a description of the duties of the individual.

(8) A description of the efforts the offeror will make to assure that small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns have an equitable opportunity to compete for subcontracts.

(9) Assurances that the offeror will include the clause of this contract entitled "Utilization of Small Business Concerns" in all subcontracts that offer further subcontracting opportunities, and that the offeror will require all subcontractors (except small business concerns) that receive subcontracts in excess of $500,000 ($1,000,000 for construction of any public facility) to adopt a subcontracting plan that complies with the requirements of this clause.

(10) Assurances that the offeror will—

(i) Cooperate in any studies or surveys as may be required;

(ii) Submit periodic reports so that the Government can determine the extent of compliance by the offeror with the subcontracting plan;

(iii) Submit Standard Form (SF) 294, Subcontracting Report for Individual Contracts, and/or SF 295, Summary Subcontract Report, in accordance with paragraph (j) of this clause. The reports shall provide information on subcontract awards to small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, women-owned small business concerns, and Historically Black Colleges and Universities and Minority Institutions. Reporting shall be in accordance with the instructions on the forms or as provided in agency regulations.

(iv) Ensure that its subcontractors agree to submit SF 294 and SF 295.

(11) A description of the types of records that will be maintained concerning procedures that have been adopted to comply with the requirements and goals in the plan, including establishing source lists; and a description of the offeror's efforts to locate small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns and award subcontracts to them. The records shall include at least the following (on a plant-wide or company-wide basis, unless otherwise indicated):

(i) Source lists (*e.g.*, PRO-Net), guides, and other data that identify small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns.

(ii) Organizations contacted in an attempt to locate sources that are small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, or women-owned small business concerns.

(iii) Records on each subcontract solicitation resulting in an award of more than

$100,000, indicating—

(A) Whether small business concerns were solicited and, if not, why not;

(B) Whether veteran-owned small business concerns were solicited and, if not, why not;

(C) Whether service-disabled veteran-owned small business concerns were solicited and, if not, why not;

(D) Whether HUBZone small business concerns were solicited and, if not, why not;

(E) Whether small disadvantaged business concerns were solicited and, if not, why not;

(F) Whether women-owned small business concerns were solicited and, if not, why not; and

(G) If applicable, the reason award was not made to a small business concern.

(iv) Records of any outreach efforts to contact—

(A) Trade associations;

(B) Business development organizations;

(C) Conferences and trade fairs to locate small, HUBZone small, small disadvantaged, and women-owned small business sources; and

(D) Veterans service organizations.

(v) Records of internal guidance and encouragement provided to buyers through—

(A) Workshops, seminars, training, etc.; and

(B) Monitoring performance to evaluate compliance with the program's requirements.

(vi) On a contract-by-contract basis, records to support award data submitted by the offeror to the Government, including the name, address, and business size of each subcontractor. Contractors having commercial plans need not comply with this requirement.

(e) In order to effectively implement this plan to the extent consistent with efficient contract performance, the Contractor shall perform the following functions:

(1) Assist small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns by arranging solicitations, time for the preparation of bids, quantities, specifications, and delivery schedules so as to facilitate the participation by such concerns. Where the Contractor's lists of potential small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business subcontractors are excessively long, reasonable effort shall be made to give all such small business concerns an opportunity to compete over a period of time.

(2) Provide adequate and timely consideration of the potentialities of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns in all "make-or-buy" decisions.

(3) Counsel and discuss subcontracting opportunities with representatives of small business, veteran-owned small business, service-disabled veteran-owned small business , HUBZone small business, small disadvantaged business, and women-owned small business firms.

(4) Provide notice to subcontractors concerning penalties and remedies for misrepresentations of business status as small, veteran-owned small business, HUBZone small, small disadvantaged, or women-owned small business for the purpose of obtaining a subcontract that is to be included as part or all of a goal contained in the Contractor's subcontracting plan.

(f) A master plan on a plant or division-wide basis that contains all the elements required by paragraph (d) of this clause, except goals, may be incorporated by reference as a part of the subcontracting plan required of the offeror by this clause; provided —

(1) The master plan has been approved;

(2) The offeror ensures that the master plan is updated as necessary and provides copies of the approved master plan, including evidence of its approval, to the Contracting Officer; and

(3) Goals and any deviations from the master plan deemed necessary by the Contracting Officer to satisfy the requirements of this contract are set forth in the individual subcontracting plan.

(g) A commercial plan is the preferred type of subcontracting plan for contractors furnishing commercial

items. The commercial plan shall relate to the offeror's planned subcontracting generally, for both commercial and Government business, rather than solely to the Government contract. Commercial plans are also preferred for subcontractors that provide commercial items under a prime contract, whether or not the prime contractor is supplying a commercial item.

(h) Prior compliance of the offeror with other such subcontracting plans under previous contracts will be considered by the Contracting Officer in determining the responsibility of the offeror for award of the contract.

(i) The failure of the Contractor or subcontractor to comply in good faith with—

(1) The clause of this contract entitled "Utilization Of Small Business Concerns;" or

(2) An approved plan required by this clause, shall be a material breach of the contract.

(j) The Contractor shall submit the following reports:

(1) *Standard Form 294, Subcontracting Report for Individual Contracts.* This report shall be submitted to the Contracting Officer semiannually and at contract completion. The report covers subcontract award data related to this contract. This report is not required for commercial plans.

(2) *Standard Form 295, Summary Subcontract Report.* This report encompasses all of the contracts with the awarding agency. It must be submitted semi-annually for contracts with the Department of Defense and annually for contracts with civilian agencies. If the reporting activity is covered by a commercial plan, the reporting activity must report annually all subcontract awards under that plan. All reports submitted at the close of each fiscal year (both individual and commercial plans) shall include a breakout, in the Contractor's format, of subcontract awards, in whole dollars, to small disadvantaged business concerns by North American Industry Classification System (NAICS) Industry Subsector. For a commercial plan, the Contractor may obtain from each of its subcontractors a predominant NAICS Industry Subsector and report all awards to that subcontractor under its predominant NAICS Industry Subsector.

(End of clause)

31. *FAR 52.219-16 LIQUIDATED DAMAGES-SUBCONTRACTING PLAN (JAN 1999)

(a) Failure to make a good faith effort to comply with the subcontracting plan, as used in this clause, means a willful or intentional failure to perform in accordance with the requirements of the subcontracting plan approved under the clause in this contract entitled ``Small Business Subcontracting Plan," or willful or intentional action to frustrate the plan.

(b) Performance shall be measured by applying the percentage goals to the total actual subcontracting dollars or, if a commercial plan is involved, to the pro rata share of actual subcontracting dollars attributable to Government contracts covered by the commercial plan., If, at contract completion, or in the case of a commercial plan, at the close of the fiscal year for which the plan is applicable, the Contractor has failed to meet its subcontracting goals and the Contracting Officer decides in accordance with paragraph (c) of this clause that the Contractor failed to make a good faith effort to comply with its subcontracting plan, established in accordance with the clause in this contract entitled ``Small Business Subcontracting Plan," the Contractor shall pay the Government liquidated damages in an amount stated. The amount of probable damages attributable to the Contractor's failure to comply shall be an amount equal to the actual dollar amount by which the Contractor failed to achieve each subcontract goal.

(c) Before the Contracting Officer makes a final decision that the Contractor has failed to make such good faith effort, the Contracting Officer shall give the Contractor written notice specifying the failure and permitting the Contractor to demonstrate what good faith efforts have been made and to discuss the matter. Failure to respond to the notice may be taken as an admission that no valid explanation exists. If, after consideration of all the pertinent data, the Contracting Officer finds that the Contractor failed to make a good faith effort to comply with the subcontracting plan, the Contracting Officer shall issue a final decision to that effect and require that the Contractor pay the Government liquidated damages as provided in paragraph (b) of this clause.

(d) With respect to commercial plans, the Contracting Officer who approved the plan will perform the functions of the Contracting Officer under this clause on behalf of all agencies with contracts covered by a commercial plan.

(e) The Contractor shall have the right of appeal, under the clause in this contract entitled, Disputes, from many final decision of the Contracting Officer.

(f) Liquidated damages shall be in addition to any other remedies that the Government may have.

32. FAR 52.219-27 NOTICE OF TOTAL SERVICE-DISABLED VETERAN-OWNED SMALL BUSINESS SET-ASIDE (MAY 2004)

[Applicable only to projects restricted to Service-disabled veteran-owned small business set- asides]

(a) *Definition*. "Service-disabled veteran-owned small business concern"-

(1) Means a small business concern-

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) "Service-disabled veteran" means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

(b) *General*.

(1) Offers are solicited only from service-disabled veteran-owned small business concerns. Offers received from concerns that are not service-disabled veteran-owned small business concerns shall not be considered.

(2) Any award resulting from this solicitation will be made to a service-disabled veteran-owned small business concern.

(c) *Agreement*. A service-disabled veteran-owned small business concern agrees that in the performance of the contract, in the case of a contract for-

(1) Services (except construction), at least 50 percent of the cost of personnel for contract performance will be spent for employees of the concern or employees of other service-disabled veteran-owned small business concerns;

(2) Supplies (other than acquisition from a nonmanufacturer of the supplies), at least 50 percent of the cost of manufacturing, excluding the cost of materials, will be performed by the concern or other service-disabled veteran-owned small business concerns;

(3) General construction, at least 15 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other service-disabled veteran-owned small business concerns; or

(4) Construction by special trade contractors, at least 25 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other service-disabled veteran-owned small business concerns.

(d) A joint venture may be considered a service-disabled veteran owned small business concern if-

(1) At least one member of the joint venture is a service-disabled veteran-owned small business concern, and makes the following representations: That it is a service-disabled veteran-owned small business concern, and that it is a small business concern under the North American Industry Classification Systems (NAICS) code assigned to the procurement;

(2) Each other concern is small under the size standard corresponding to the NAICS code assigned to the procurement; and

(3) The joint venture meets the requirements of paragraph 7 of the explanation of Affiliates in 19.101 of the Federal Acquisition Regulation.

(4) The joint venture meets the requirements of 13 CFR 125.15(b)

(e) Any service-disabled veteran-owned small business concern (nonmanufacturer) must meet the requirements in 19.102(f) of the Federal Acquisition Regulation to receive a benefit under this program.

(End of clause)

33. DFARS 252.219-7003 SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (DOD CONTRACTS) (APR 1996)

This clause supplements the Federal Acquisition Regulation 52.219-9, Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan, clause of this contract.

(a) Definitions.

"Historically black colleges and universities," as used in this clause, means institutions determined by the Secretary of Education to meet the requirements of 34 CFR Section 608.2. The term also means any nonprofit research institution that was an integral part of such a college or university before November 14, 1986.

"Minority institutions," as used in this clause, means institutions meeting the requirements of Section 1046(3) of the Higher Education Act of 1965 (20 U.S.C. 1135d-5(3)). The term also includes Hispanic-serving institutions as defined in Section 316(b)(1) of such Act (20 U.S.C. 1059c(b)(1).

(b) Except for company or division-wide commercial products subcontracting plans, the term "small disadvantaged business," when used in the FAR 52.219-9 clause, includes historically black colleges and universities and minority institutions in addition to small disadvantaged business concerns.

(c) Work under the contract or its subcontracts shall be credited toward meeting the small disadvantaged business concern goal required by paragraph (d) of the FAR 52.219-9 clause when:

(1) It is performed on Indian lands or in joint venture with an Indian tribe or a tribally-owned corporation, and

(2) It meets the requirements of 10 U.S.C. 2323a.

(d) Subcontracts awarded to workshops approved by the Committee for Purchase from People Who are Blind or Severely Disabled (41 U.S.C. 46-48), may be counted toward the Contractor's small business subcontracting goal.

(e) A mentor firm, under the Pilot Mentor-Protege Program established under Section 831 of Pub. L. 101-510, as amended, may count toward its small disadvantaged business goal, subcontracts awarded--

(1) Protege firms which are qualified organizations employing the severely handicapped; and

(2) Former protege firms that meet the criteria in Section 831(g)(4) of Pub. L. 101-510.

(f) The master plan approval referred to in paragraph (f) of the FAR 52.219-9 clause is approval by the Contractor's cognizant contract administration activity.

(g) In those subcontracting plans whihc specifically identify small, small disadvantaged, and women-owned businesses, the Contractor shall notify the Administrative Contracting Officer of any substitutions of firms that are not small, small disadvantaged, or women-owned small businesses for the firms listed in the subcontracting plan. Notifications shall be in writing and shall occur within a reasonable period of time after award of the subcontract. Contractor-specified formats shall be acceptable.

34. DFARS 252.219-7004 SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (TEST PROGRAM) (JUN 1997)

(a) Definition. "Subcontract," as used in this clause, means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime Contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

(b) The Offeror's comprehensive small business subcontracting plan and its successors, which are authorized by and approved under the test program of Section 834 of Pub. L. 101-189, shall be included in and made a part of the resultant contract. Upon expulsion from the test program or expiration of the test program, the Contractor shall negotiate an individual subcontracting plan for all future contracts that meet the requirements of Section 211 of Publ. L. 95-507.

(c) The Contractor shall submit Standard Form 295, Summary Subcontract Report, in accordance with the instructions on the form, except--

(1) One copy of SF 295 and attachments shall be submitted to Director, Small and Disadvantaged Business Utilization, Office of the Deputy Under Secretary of Defense (International and Commercial Programs), 3061 Defense Pentagon, Room 2A338, Washington, DC 20301-3061; and

(2) Item 14, Remarks, shall be completed to include semi-annual cumulative--

(1) Small business, small disadvantaged business and women-owned small business goals; and

(2) Small business and small disadvantaged business goals, actual accomplishments, and percentages for each of the two designated industry categories.

(d) The failure of the Contractor or subcontractor to comply in good faith with (1) the clause of this contract entitled "Utilization of Small, Small Disadvantaged and Women-Owned Small Business Concerns," or (2) an approved plan required by this clause, shall be a material breach of the contract.

35. DFARS 252.219-7009 SECTION 8(a) DIRECT AWARD (MAR 2002)

(a) This contract is issued as a direct award between the contracting office and the 8(a) Contractor pursuant to the Partnership Agreement dated February 1, 2002, between the Small Business Administration (SBA) and the Department of Defense. Accordingly, the SBA, even if not identified in Section A of this contract, is the prime contractor and retains responsibility for 8(a) certification, for 8(a) eligibility determinations and related issues, and for providing counseling and assistance to the 8(a) Contractor under the 8(a) Program. The cognizant SBA district office is:

[To be completed by the Contracting Officer at the time of award]

(b) The contracting office is responsible for administering the contract and for taking any action on behalf of the Government under the terms and conditions of the contract; provided that the contracting office shall give advance notice to the SBA before it issues a final notice terminating performance, either in whole or in part, under the contract. The contracting office also shall coordinate with the SBA prior to processing any novation agreement. The contracting office may assigncontract administration functions to a contract administration office.

(c) The 8(a) Contractor agrees that--

(1) It will notify the Contracting Officer, simultaneous with its notification to the SBA (as required by SBA's 8(a) regulations at 13 CFR 124.308), when the owner or owners upon whom 8(a) eligibility is based plan to relinquish ownership or control of the concern. Consistent with Section 407 of Pub. L. 100-656, transfer of ownership or control shall result in termination of the contract for convenience, unless the SBA waives the requirement for termination prior to the actual relinquishing of ownership and control; and

(2) It will not subcontract the performance of any of the requirements of this contract without the prior written approval of the SBA and the Contracting Officer.

(End of clause)

36. DFARS 252.219-7010 ALTENATE A (JUN 1998)
[When Competitive 8(a) Contracting Procedures are used]

As prescribed in 219.811-3(2), substitute the following paragraph (c) for paragraph (c) of the clause at FAR 52.219-18:

(c) Any award resulting from this solicitation will be made directly by the Contracting Officer to the successful 8(a) offeror selected through the evaluation criteria set forth in this solicitation.

37. *FAR 52.222-1 NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (FEB 1997)

If the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the Contractor shall immediately give notice, including all relevant information, to the Contracting Officer. (End of clause)

38. *FAR 52.222-3 CONVICT LABOR (JUNE 2003)

(a) Except as provided in paragraph (b) of this clause, the Contractor shall not employ in the performance of this contract any person undergoing a sentence of imprisonment imposed by any court of a State, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, or the U.S. Virgin Islands.

(b) The Contractor is not prohibited from employing persons—

(1) On parole or probation to work at paid employment during the term of their sentence;

(2) Who have been pardoned or who have served their terms; or

(3) Confined for violation of the laws of any of the States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, or the U.S. Virgin Islands who are authorized to work at paid employment in the community under the laws of such jurisdiction, if—

(i) The worker is paid or is in an approved work training program on a voluntary basis;

(ii) Representatives of local union central bodies or similar labor union organizations have been consulted;

(iii) Such paid employment will not result in the displacement of employed workers, or be applied in skills, crafts, or trades in which there is a surplus of available gainful labor in the locality, or impair existing contracts for services;

(iv) The rates of pay and other conditions of employment will not be less than those paid or provided for work of a similar nature in the locality in which the work is being performed; and

(v) The Attorney General of the United States has certified that the work-release laws or regulations of the jurisdiction involved are in conformity with the requirements of Executive Order 11755, as amended by Executive Orders 12608 and 12943.

(End of clause)

39. *FAR 52.222-4 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT—OVERTIME COMPENSATION (SEPT 2000)

(a) *Overtime requirements*. No Contractor or subcontractor employing laborers or mechanics (see Federal Acquisition Regulation 22.300) shall require or permit them to work over 40 hours in any workweek unless they are paid at least 1 and 1/2 times the basic rate of pay for each hour worked over 40 hours.

(b) *Violation; liability for unpaid wages; liquidated damages*. The responsible Contractor and subcontractor are liable for unpaid wages if they violate the terms in paragraph (a) of this clause. In addition, the Contractor and subcontractor are liable for liquidated damages payable to the Government. The Contracting Officer will assess liquidated damages at the rate of $10 per affected employee for each calendar day on which the employer required or permitted the employee to work in excess of the standard workweek of 40 hours without paying overtime wages required by the Contract Work Hours and Safety Standards Act.

(c) *Withholding for unpaid wages and liquidated damages*. The Contracting Officer will withhold from

payments due under the contract sufficient funds required to satisfy any Contractor or subcontractor liabilities for unpaid wages and liquidated damages. If amounts withheld under the contract are insufficient to satisfy Contractor or subcontractor liabilities, the Contracting Officer will withhold payments from other Federal or Federally assisted contracts held by the same Contractor that are subject to the Contract Work Hours and Safety Standards Act.

(d) *Payrolls and basic records*. (1) The Contractor and its subcontractors shall maintain payrolls and basic payroll records for all laborers and mechanics working on the contract during the contract and shall make them available to the Government until 3 years after contract completion. The records shall contain the name and address of each employee, social security number, labor classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. The records need not duplicate those required for construction work by Department of Labor regulations at 29 CFR 5.5(a)(3) implementing the Davis-Bacon Act .

(2) The Contractor and its subcontractors shall allow authorized representatives of the Contracting Officer or the Department of Labor to inspect, copy, or transcribe records maintained under paragraph (d)(1) of this clause. The Contractor or subcontractor also shall allow authorized representatives of the Contracting Officer or Department of Labor to interview employees in the workplace during working hours.

(e) *Subcontracts*. The Contractor shall insert the provisions set forth in paragraphs (a) through (d) of this clause in subcontracts exceeding $100,000 and require subcontractors to include these provisions in any lower-tier subcontracts. The Contractor shall be responsible for compliance by any subcontractor or lower-tier subcontractor with the provisions set forth in paragraphs (a) through (d) of this clause.
(End of clause)

40. *FAR 52.222-6 DAVIS-BACON ACT (FEB 1995)

(a) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (d) of this clause; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such period. Such laborers and mechanics shall be paid not less than the appropriate wage rate and fringe benefits in the wage determination for the classification of work actually performed, without regard to skill, except as provided in the clause entitled Apprentices and Trainees. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph (b) of this clause) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(b) (1) The Contracting Officer shall require that any class of laborers or mechanics, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The Contracting Officer shall approve an additional classification and wage rate and fringe benefits therefor only when all the following criteria have been met:

(i) Tthe work to be performed by the classification requested is not performed by a classification in the wage determination.

(ii) The classification is utilized in the area by the construction industry.

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the Contractor and laborers and mechanics to be employed in the classification (if known), or their representatives, and the Contracting Officer agree on the classification and wage rate (including the amount designated for fringe benefits, where appropriate), a report of the action taken shall be sent by the Contracting Officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator or an authorized representative will approve,

modify, or disapprove every additional classification action within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(3) In the event the Contractor, the laborers or mechanics to be employed in the classification, or their representatives, and the Contracting Officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the Contracting Officer shall refer the questions, including the views of all interested parties and the recommendation of the Contracting Officer, to the Administrator of the Wage and Hour Division for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits, where appropriate) determined pursuant to subparagraphs (b)(2) and (b)(3) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(c) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(d) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

41. *FAR 52.222-7 WITHHOLDING OF FUNDS (FEB 1988)

The Contracting Officer shall, upon his or her own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same Prime Contractor, or any other Federally assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same Prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the Contracting Officer may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

42. *FAR 52.222-8 PAYROLLS AND BASIC RECORDS (FEB 1988)

(a) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of 3 years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found, under paragraph (d) of the clause entitled Davis-Bacon Act, that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(b) (1) The Contractor shall submit weekly for each week in which any contract work is performed a coy of all payrolls to the Contracting Officer. The payrolls submitted shall set out accurately and

completely all of the information required to be maintained under paragraph (a) of this clause. This information may be submitted in any form desired. Optional Form WH-347 (Federal Stock Number 029-005-00014-1) is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. The Prime Contractor is responsible for the submission of copies of payrolls by all subcontractors.

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify--

(i) That the payroll for the payroll period contains the information required to be maintained under paragraph (a) of this clause and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR Part 3; and

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph (b)(2) of this clause.

(4) The falsification of any of the certifications in this clause may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 3729 of Title 31 of the United States Code.

(c) The Contractor or subcontractor shall make the records required under paragraph (a) of this clause available for inspection, copying, or transcription by the Contracting Officer or authorized representatives of the Contracting Officer or the Department of Labor. The Contractor of subcontractor shall permit the Contracting Officer or representatives of the Contracting Officer or the Department of Labor to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit required records or to make them available, the Contracting Officer may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

43. *FAR 52.222-9 APPRENTICES AND TRAINEES (FEB 1988)

(a) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in this paragraph, shall be paid not less than the applicable wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different

practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the Contractor will not longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(b) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed in the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate in the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate in the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(c) Equal employment opportunity. The utilization of apprentices, trainees, and journeymen under this clause shall be inconformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

44. *FAR 52.222-10 COMPLIANCE WITH COPELAND ACT REQUIREMENTS (FEB 1988)

The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.

45. *FAR 52.222-11 SUBCONTRACTS (LABOR STANDARDS) (FEB 1988)

(a) The Contractor or subcontractor shall insert in any subcontracts the clauses entitled Davis-Bacon Act, Contract Work Hours and Safety Standards Act--Overtime Compensation, Apprentices and Trainees, Payrolls and Basic Records, Compliance with Copeland Act Requirements, Withholding of Funds, Subcontracts (Labor Standards), Contract Termination--Debarment, Disputes Concerning Labor Standards, Compliance with Davis-Bacon and Related Act Regulations ,and Certification of Eligibility, and such other clauses as the Contracting Officer may, by appropriate instructions, require, and also a clause requiring subcontractors to include these clauses in any lower tier subcontracts. The Prime Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with all the contract clauses cited in this paragraph.

(b) (1) Within 14 days after award of the contract, the Contractor shall deliver to the Contracting Officer a completed Statement and Acknowledgment Form (SF 1413) for each subcontract, including the subcontractor's signed and dated acknowledgment that the clauses set forth in paragraph (a) of this clause have been included in the subcontract.

(2) Within 14 days after the award of any subsequently awarded subcontract the Contractor shall deliver to the Contracting Officer an updated completed SF 1413 for such additional subcontract.

46. *FAR 52.222-12 CONTRACT TERMINATION--DEBARMENT (FEB 1988)

A breach of the contract clauses entitled Davis-Bacon Act, Contract Work Hours and Safety Standards Act--Overtime Compensation, Apprentices and Trainees, Payrolls and Basic Records, Compliance with Copeland Act Requirements, Subcontracts (Labor Standards), Compliance with Davis-Bacon and Related Act Regulations, or Certification of Eligibility may be grounds for termination of the contract, and for debarment as a Contractor and subcontractor as provided in 29 CFR 5.12.

47. *FAR 52.222-13 COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988)

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are hereby incorporated by reference in this contract.

48. *FAR 52.222-14 DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)

The United States Department of Labor has set forth in 29 CFR Parts 5, 6, and 7 procedures for resolving disputes concerning labor standards requirements. Such disputes shall be resolved in accordance with those procedures and not the Disputes clause of this contract. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency the U.S. Department of Labor, or the employees of their representatives.

49. *FAR 52.222-15 CERTIFICATION OF ELIGIBILITY (FEB 1988)

(a) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(b) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(c) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

50. *FAR 52.222-26 EQUAL OPPORTUNITY (APR 2002)

(a) *Definition*. "United States," as used in this clause, means the 50 States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, and Wake Island.

(b) If, during any 12-month period (including the 12 months preceding the award of this contract), the Contractor has been or is awarded nonexempt Federal contracts and/or subcontracts that have an aggregate value in excess of $10,000, the Contractor shall comply with paragraphs (b)(1) through (b)(11) of this clause, except for work performed outside the United States by employees who were not recruited within the United States. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.

(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. However, it shall not be a violation of this clause for the Contractor to extend a publicly announced preference in employment to Indians living on or near an Indian reservation, in connection with employment opportunities on or near an Indian reservation, as permitted by 41 CFR 60-1.5.

(2) The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. This shall include, but not be limited to—

(i) Employment;
(ii) Upgrading;
(iii) Demotion;
(iv) Transfer;
(v) Recruitment or recruitment advertising;
(vi) Layoff or termination;
(vii) Rates of pay or other forms of compensation; and
(viii) Selection for training, including apprenticeship.

(3) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.

(4) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(5) The Contractor shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

(6) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.

(7) The Contractor shall furnish to the contracting agency all information required by Executive Order 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. The Contractor shall also file Standard Form 100 (EEO-1), or any successor form, as prescribed in 41 CFR part 60-1. Unless the Contractor has filed within the 12 months preceding the date of contract award, the Contractor shall, within 30 days after contract award, apply to either the regional Office of Federal Contract Compliance Programs (OFCCP) or the local office of the Equal Employment Opportunity Commission for the necessary forms.

(8) The Contractor shall permit access to its premises, during normal business hours, by the contracting agency or the OFCCP for the purpose of conducting on-site compliance evaluations and complaint investigations. The Contractor shall permit the Government to inspect and copy any books, accounts, records (including computerized records), and other material that may be relevant to the matter under investigation and pertinent to compliance with Executive Order 11246, as amended, and rules and regulations that implement the Executive Order.

(9) If the OFCCP determines that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts, under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended; in the rules, regulations, and orders of the Secretary of Labor; or as otherwise provided by law.

(10) The Contractor shall include the terms and conditions of paragraphs (b)(1) through (11) of this clause in every subcontract or purchase order that is not exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor.

(11) The Contractor shall take such action with respect to any subcontract or purchase order as the Contracting Officer may direct as a means of enforcing these terms and conditions, including sanctions for noncompliance, provided, that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of any direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

(c) Notwithstanding any other clause in this contract, disputes relative to this clause will be governed by the procedures in 41 CFR 60-1.1.

(End of clause)

51. *FAR 52.222-27 AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION (FEB 1999)

(a) Definitions.

"Covered area," as used in this clause, means the geographical area described in the solicitation for this contract.

"Deputy Assistant Secretary," as used in this clause, means the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, or a designee

"Employer's identification number," as used in this clause, means the Federal Social Security number used on the employer's quarterly Federal tax return, U.S. Treasury Department Form 941.

"Minority," as used in this clause, means--

(1) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

(2) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands);

(3) Black (all persons having origins in any of the black African racial groups not of Hispanic origin); and

(4) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race).

(b) If the Contractor, or a subcontractor at any tier, subcontracts a portion of the work involving any construction trade each such subcontract in excess of $10,000 shall include this clause and the Notice containing the goals for minority and female participation stated in the solicitation for this contract.

(c) If the Contractor is participating in a Hometown Plan (41 CFR 60-4) approved by the U.S. Department of Labor in a covered area, either individually or through an association, its affirmative actin obligations on all work in the plan area (including goals) shall comply with the plan for those trades that have unions participating in the plan. Contractors must be able to demonstrate participation in, and compliance with, the provisions of the plan. Each Contractor or subcontractor participating in an approved plan is also required to comply with its obligations under the Equal Opportunity clause, and to make a good faith effort to achieve each goal under the plan in each trade in which it has employees. The overall good-faith performance by other Contractors or subcontractors toward a goal in an approved plan does not excuse any Contractor's or subcontractor's failure to make good-faith efforts to achieve the plan's goals.

(d) The Contractor shall implement the affirmative action procedures in subparagraphs (g)(1) through (16) of this clause. The goals stated in the solicitation for this contract are expressed as percentages of the total hours of employment and training of minority and female utilization that the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where that work is actually performed. The Contractor is expected to make substantially uniform progress toward its goals in each craft.

(e) Neither the terms and conditions of any collective bargaining agreement, nor the failure by a union with which the Contractor has a collective bargaining agreement, to refer minorities or women shall excuse the Contractor's obligations under this clause, Executive Order 11246, as amended, or the regulations thereunder.

(f) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

(g) The Contractor shall take affirmative action to ensure equal employment opportunity. The evaluation of the Contractor's compliance with this clause shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and implement affirmative action steps at least as extensive as the following:

(1) Ensure a working environment free of harassment, intimidation, and coercion at all sites and in all facilities where the Contractor's employees are assigned to work. The Contractor, if possible, will assign two or more women to each construction project. The Contractor shall ensure that foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at these sites or facilities.

(2) Establish and maintain a current list of sources for minority and female recruitment. Provide written notification to minority and female recruitment sources and community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

(3) Establish and maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant, referrals of minorities or females from unions, recruitment sources, or community organizations, and the action taken with respect to each individual. If an individual was sent to the union hiring hall for referral and not referred back to the Contractor by the union or, if referred back, not employed by the Contractor, this shall be documented in the file, along with whatever additional actions the Contractor may have taken.

(4) Immediately notify the Deputy Assistant Secretary when the union or unions with which the Contractor has a collective bargaining agreement has not referred back to the Contractor a minority or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

(5) Develop on-the-job training opportunities and/or participate in training programs for the area that expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under subparagraph (g)(2) of this clause.

(6) Disseminate the Contractor's equal employment policy by--

(i) Providing notice of the policy to unions and to training, recruitment, and outreach programs, and requesting their cooperation in assisting the Contractor in meeting its contract obligations;

(ii) Including the policy in any policy manual and in collective bargaining agreements;

(iii) Publicizing the policy in the company newspaper, annual report, etc.;

(iv) Reviewing the policy with all management personnel and with all minority and female employees at least once a year; and

(v) Posting the policy on bulletin boards accessible to employees at each location where construction work is performed.

(7) Review, at least annually, the Contractor's equal employment policy and affirmative action obligations with all employees having responsibility for hiring, assignment, layoff, termination, or other employment decisions. Conduct review of this policy with all on-site supervisory personnel before initiating construction work at a job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

(8) Disseminate the Contractor's equal employment policy externally by including it in any advertising in the news media, specifically including minority and female news media. Provide written notification to, and discuss this policy with, other Contractors and subcontractors with which the Contractor does or anticipates doing business.

(9) Direct recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students, and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than 1 month before the date for acceptance of applications for apprenticeship or training by any recruitment source, send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

(10) Encourage present minority and female employees to recruit minority persons and women. Where reasonable, provide after-school, summer, and vacation employment to minority and female youth both on the site and in other areas of the Contractor's workforce.

(11) Validate all tests and other selection requirements where required under 41 CFR 60-3.

(12) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities. Encourage these employees to seek or to prepare for, through appropriate training, etc., opportunities for promotion.

(13) Ensure that seniority practices job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment-related activities to ensure that the Contractor's obligations under this contract are being carried out.

(14) Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

(15) Maintain a record of solicitations for subcontracts for minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

(16) Conduct a review, at lest annually, of all supervisors' adherence to and performance under the Contractor's equal employment policy and affirmative action obligations.

(h) The Contractor is encouraged to participate in voluntary associations that may assist in fulfilling one or more of the affirmative action obligations contained in subparagraphs (g)(1) through (16) of this clause. The efforts of a contractor association, joint contractor-union, contractor-community, or similar group of which the contractor is a member and participant may be asserted as fulfilling one or more of its obligations under subparagraphs (g)(1) through (16) of this clause, provided the Contractor--

(1) Actively participates in the group;

(2) Makes every effort to ensure that the group has a positive impact on the employment of minorities and women in the industry;

(3) Ensures that concrete benefits of the program are reflected in the Contractor's minority and female workforce participation;

(4) Makes a good-faith effort to meet its individual goals and timetables; and

(5) Can provide access to documentation that demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply is the Contractor's, and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

(i) A single goal for minorities and a separate single goal for women shall be established. The Contractor is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and nonminority. Consequently, the Contractor may be in violation of Executive Order 11246, as amended, if a particular group is employed in a substantially disparate manner.

(j) The Contractor shall not use goals or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

(k) The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts under Executive Order 11246, as amended.

(l) The Contractor shall carry out such sanctions and penalties for violation of this clause and of the Equal Opportunity clause, including suspension, termination, and cancellation of existing subcontracts, as may be imposed or ordered under Executive Order 11246, as amended, and its implementing regulations, by the OFCCP. Any failure to carry out these sanctions and penalties as ordered shall be a violation of this clause and Executive Order 11246, as amended.

(m) The Contractor in fulfilling its obligations under this clause shall implement affirmative action procedures at least as extensive as those prescribed in paragraph (g) of this clause, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of Executive Order 11246, as amended, the implementing regulations, or this clause, the Deputy Assistant Secretary shall take action as prescribed in 41 CFR 60-4.8.

(n) The Contractor shall designate a responsible official to--

(1) Monitor all employment-related activity to ensure that the Contractor's equal employment policy is being carried out;

(2) Submit reports as may be required by the Government; and

(3) Keep records that shall at least include for each employee the name, address, telephone number, construction trade, union affiliation (if any), employee identification number, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, separate records are not required to be maintained.

(o) Nothing contained herein shall be construed as a limitation upon the application of other laws that establish different standards of compliance or upon the requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

52. *FAR 52.222-35 EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)

(a) *Definitions*. As used in this clause—

"All employment openings" means all positions except executive and top management, those positions that will be filled from within the Contractor's organization, and positions lasting 3 days or less. This term includes full-time employment, temporary employment of more than 3 days duration, and part-time employment.

"Executive and top management" means any employee—

(1) Whose primary duty consists of the management of the enterprise in which the individual is employed or of a customarily recognized department or subdivision thereof;

(2) Who customarily and regularly directs the work of two or more other employees;

(3) Who has the authority to hire or fire other employees or whose suggestions and recommendations as to the hiring or firing and as to the advancement and promotion or any other change of status of other employees will be given particular weight;

(4) Who customarily and regularly exercises discretionary powers; and

(5) Who does not devote more than 20 percent or, in the case of an employee of a retail or service establishment, who does not devote more than 40 percent of total hours of work in the work week to activities that are not directly and closely related to the performance of the work described in paragraphs (1) through (4) of this definition. This paragraph (5) does not apply in the case of an employee who is in sole charge of an establishment or a physically separated branch establishment, or who owns at least a 20 percent interest in the enterprise in which the individual is employed.

"Other eligible veteran" means any other veteran who served on active duty during a war or in a campaign or expedition for which a campaign badge has been authorized.

"Positions that will be filled from within the Contractor's organization" means employment openings for which the Contractor will give no consideration to persons outside the Contractor's organization (including any affiliates, subsidiaries, and parent companies) and includes any openings the Contractor proposes to fill from regularly established "recall" lists. The exception does not apply to a particular opening once an employer decides to consider applicants outside of its organization.

"Qualified special disabled veteran" means a special disabled veteran who satisfies the requisite skill, experience, education, and other job-related requirements of the employment position such veteran holds or desires, and who, with or without reasonable accommodation, can perform the essential functions of such position.

"Special disabled veteran" means—

(1) A veteran who is entitled to compensation (or who but for the receipt of military retired pay would be entitled to compensation) under laws administered by the Department of Veterans Affairs for a disability—

(i) Rated at 30 percent or more; or

(ii) Rated at 10 or 20 percent in the case of a veteran who has been determined under 38 U.S.C. 3106 to have a serious employment handicap (*i.e*., a significant impairment of the veteran's ability to prepare for, obtain, or retain employment consistent with the veteran's abilities, aptitudes, and interests); or

(2) A person who was discharged or released from active duty because of a service-connected disability.

"Veteran of the Vietnam era" means a person who—

(1) Served on active duty for a period of more than 180 days and was discharged or released from active duty with other than a dishonorable discharge, if any part of such active duty occurred—

(i) In the Republic of Vietnam between February 28, 1961, and May 7, 1975; or

(ii) Between August 5, 1964, and May 7, 1975, in all other cases; or

(2) Was discharged or released from active duty for a service-connected disability if any part of the active duty was performed—

(i) In the Republic of Vietnam between February 28, 1961, and May 7, 1975; or

(ii) Between August 5, 1964, and May 7, 1975, in all other cases.

(b) *General*. (1) The Contractor shall not discriminate against the individual because the individual is a special disabled veteran, a veteran of the Vietnam era, or other eligible veteran, regarding any position for which the

employee or applicant for employment is qualified. The Contractor shall take affirmative action to employ, advance in employment, and otherwise treat qualified special disabled veterans, veterans of the Vietnam era, and other eligible veterans without discrimination based upon their disability or veterans' status in all employment practices such as—

(i) Recruitment, advertising, and job application procedures;

(ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff and rehiring;

(iii) Rate of pay or any other form of compensation and changes in compensation;

(iv) Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists;

(v) Leaves of absence, sick leave, or any other leave;

(vi) Fringe benefits available by virtue of employment, whether or not administered by the Contractor;

(vii) Selection and financial support for training, including apprenticeship, and on-the-job training under 38 U.S.C. 3687, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;

(viii) Activities sponsored by the Contractor including social or recreational programs; and

(ix) Any other term, condition, or privilege of employment.

(2) The Contractor shall comply with the rules, regulations, and relevant orders of the Secretary of Labor issued under the Vietnam Era Veterans' Readjustment Assistance Act of 1972 (the Act), as amended (38 U.S.C. 4211 and 4212).

(c) *Listing openings*. (1) The Contractor shall immediately list all employment openings that exist at the time of the execution of this contract and those which occur during the performance of this contract, including those not generated by this contract, and including those occurring at an establishment of the Contractor other than the one where the contract is being performed, but excluding those of independently operated corporate affiliates, at an appropriate local public employment service office of the State wherein the opening occurs. Listing employment openings with the U.S. Department of Labor's America's Job Bank shall satisfy the requirement to list jobs with the local employment service office.

(2) The Contractor shall make the listing of employment openings with the local employment service office at least concurrently with using any other recruitment source or effort and shall involve the normal obligations of placing a bona fide job order, including accepting referrals of veterans and nonveterans. This listing of employment openings does not require hiring any particular job applicant or hiring from any particular group of job applicants and is not intended to relieve the Contractor from any requirements of Executive orders or regulations concerning nondiscrimination in employment.

(3) Whenever the Contractor becomes contractually bound to the listing terms of this clause, it shall advise the State public employment agency in each State where it has establishments of the name and location of each hiring location in the State. As long as the Contractor is contractually bound to these terms and has so advised the State agency, it need not advise the State agency of subsequent contracts. The Contractor may advise the State agency when it is no longer bound by this contract clause.

(d) *Applicability*. This clause does not apply to the listing of employment openings that occur and are filled outside the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, American Samoa, Guam, the Virgin Islands of the United States, and Wake Island.

(e) *Postings*. (1) The Contractor shall post employment notices in conspicuous places that are available to employees and applicants for employment.

(2) The employment notices shall—

(i) State the rights of applicants and employees as well as the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified employees and applicants who are special disabled veterans, veterans of the Vietnam era, and other eligible veterans; and

(ii) Be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance Programs, Department of Labor (Deputy Assistant Secretary of Labor), and provided by or through the Contracting Officer.

(3) The Contractor shall ensure that applicants or employees who are special disabled veterans are

informed of the contents of the notice (e.g., the Contractor may have the notice read to a visually disabled veteran, or may lower the posted notice so that it can be read by a person in a wheelchair).

(4) The Contractor shall notify each labor union or representative of workers with which it has a collective bargaining agreement, or other contract understanding, that the Contractor is bound by the terms of the Act and is committed to take affirmative action to employ, and advance in employment, qualified special disabled veterans, veterans of the Vietnam era, and other eligible veterans.

(f) *Noncompliance*. If the Contractor does not comply with the requirements of this clause, the Government may take appropriate actions under the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.

(g) *Subcontracts*. The Contractor shall insert the terms of this clause in all subcontracts or purchase orders of $25,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor. The Contractor shall act as specified by the Deputy Assistant Secretary of Labor to enforce the terms, including action for noncompliance.

(End of clause)

53. *FAR 52.222-36 AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)

(a) General.

(1) Regarding any position for which the employee or applicant for employment is qualified, the Contractor shall not discriminate against any employee or applicant because of physical or mental disability. The Contractor agrees to take affirmative action to employ, advance in employment, and otherwise treat qualified individuals with disabilities without discrimination based upon their physical or mental disability in all employment practices such as--

(i) Recruitment, advertising, and job application procedures;

(ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff, and rehiring;

(iii) Rates of pay or other forms of compensation and changes in compensation;

(iv) Job assignments, job classifications, orgizational structures, position descriptions, lines of progression, and senority lists;

(v) Leaves of absence, sick leave, or any other leave;

(vi) Fringe benefits available by virtue of employment, whether or not administered by the Contractor;

(vii) Selection and financial support for training, including apprenticeships, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;

(viii) Activities sponsored by the Contractor, including social or recreational programs; and

(ix) Any other term, condition, or priviledge of employment.

(2) The Contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor (Secretary) issued under the Rehabilitation Act of 1973 (29 U.S.C. 793) (the Act), as amended.

(b) Postings.

(1) The Contractor agrees to post employment notices stating--

(i) The Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified individuals with disabilities; and

(ii) The rights of applicants and employees.

(2) These notices shall be posted in conspicuous places that are available to employees and applicants for employment. The Contractor shall ensure that applicants and employees with disabilities are informed of the contents of the notice (e.g., the Contractor may have the notice read to visually disabled individual, or may lower the posted notice so that it might be read by a person in a wheelchair). The notices shall be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance of the U.S. Department of Labor (Deputy Assistant Secretary) and shall be provided by or through the Contracting Officer.

(3) The Contractor shall notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of

Section 503 of the Act and is committed to take affirmative action to employ, and advance in employment, qualified individuals with physical or mental disabilities.

(c) Noncompliance. If the Contractor does not comply with the requirements of this clause, appropriate actions may be taken under the rules, regulations, and relevant orders of the Secretary issued pursuant to the Act.

(b) Subcontracts. The Contractor shall include the terms of this clause in every subcontract or purchase order in excess of $10,000 unless exempted by rules, regulations, or orders of the Secretary. The Contractor shall act as specified by the Deputy Assistant Secretary to enforce the terms, including action for noncompliance.

54. *FAR 52.222-37 EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)

(a) Unless the Contractor is a State or local government agency, the Contractor shall report at least annually, as required by the Secretary of Labor, on—

(1) The number of special disabled veterans, the number of veterans of the Vietnam era, and other eligible veterans in the workforce of the Contractor by job category and hiring location; and

(2) The total number of new employees hired during the period covered by the report, and of the total, the number of special disabled veterans, the number of veterans of the Vietnam era, and the number of other eligible veterans; and

(3) The maximum number and the minimum number of employees of the Contractor during the period covered by the report.

(b) The Contractor shall report the above items by completing the Form VETS-100, entitled "Federal Contractor Veterans' Employment Report (VETS-100 Report)".

(c) The Contractor shall submit VETS-100 Reports no later than September 30 of each year beginning September 30, 1988.

(d) The employment activity report required by paragraph (a)(2) of this clause shall reflect total hires during the most recent 12-month period as of the ending date selected for the employment profile report required by paragraph (a)(1) of this clause. Contractors may select an ending date—

(1) As of the end of any pay period between July 1 andAugust 31 of the year the report is due; or

(2) As of December 31, if the Contractor has prior writtenapproval from the Equal Employment Opportunity Commission to do so for purposes of submitting the Employer Information Report EEO-1 (Standard Form 100).

(e) The Contractor shall base the count of veterans reported according to paragraph (a) of this clause on voluntary disclosure. Each Contractor subject to the reporting requirements at 38 U.S.C. 4212 shall invite all special disabled veterans, veterans of the Vietnam era, and other eligible veterans who wish to benefit under the affirmative action program at 38 U.S.C. 4212 to identify themselves to the Contractor. The invitation shall state that—

(1) The information is voluntarily provided;

(2) The information will be kept confidential;

(3) Disclosure or refusal to provide the information will not subject the applicant or employee to any adverse treatment; and

(4) The information will be used only in accordance with the regulations promulgated under 38 U.S.C. 4212.

(f) The Contractor shall insert the terms of this clause in all subcontracts or purchase orders of $25,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor.

(End of clause)

55. *FAR 52.222-38 COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (DEC 2001)

By submission of its offer, the offeror represents that, if it is subject to the reporting requirements of 38 U.S.C. 4212(d) (*i.e.*, if it has any contract containing Federal Acquisition Regulation clause 52.222-37, Employment

Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans), it has submitted the most recent VETS-100 Report required by that clause.
(End of provision)

56. *FAR 52.223-3 HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997)

(a) "Hazardous material," as used in this clause, includes any material defined as hazardous under the latest version of Federal Standard No. 313 (including revisions adopted during the term of the contract).

(b) The offeror must list any hazardous material, as defined in paragraph (a) of this clause, to be delivered under this contract. The hazardous material shall be properly identified and include any applicable identification number, such as National Stock Number or Special Item Number. This information shall also be included on the Material Safety Data Sheet submitted under this contract.

Material (If none, insert "None")	Identification No.
_____	_____
_____	_____
_____	_____

(c) This list must be updated during performance of the contract whenever the Contractor determines that any other material to be delivered under this contract is hazardous.

(d) The apparently successful offeror agrees to submit, for each item as required prior to award, a Material Safety Data Sheet, meeting the requirements of 29 CFR 1910.1200(g) and the latest version of Federal Standard No. 313, for all hazardous material identified in paragraph (b) of this clause. Data shall be submitted in accordance with Federal Standard No. 313, whether or not the apparently successful offeror is the actual manufacturer of these items. Failure to submit the Material Safety Data Sheet prior to award may result in the apparently successful offeror being considered nonresponsible and ineligible for award.

(e) If, after award, there is a change in the composition of the item(s) or a revision to Federal Standard No. 313, which renders incomplete or inaccurate the data submitted under paragraph (d) of this clause, the Contractor shall promptly notify the Contracting Officer and resubmit the data.

(f) Neither the requirements of this clause nor any act or failure to act by the Government shall relieve the Contractor of any responsibility or liability for the safety of Government, Contractor, or subcontractor personnel or property.

(g) Nothing contained in this clause shall relieve the Contractor from complying with applicable Federal, State, and local laws, codes, ordinances, and regulations (including the obtaining of licenses and permits) in connection with hazardous material.

(h) The Government's rights in data furnished under this contract with respect to hazardous material are as follows:

(1) To use, duplicate and disclose any data to which this clause is applicable. The purposes of this right are to--

(i) Apprise personnel of the hazards to which they may be exposed in using, handling, packaging, transporting, or disposing of hazardous materials;

(ii) Obtain medical treatment for those affected by the material; and

(iii) Have others use, duplicate, and disclose the data for the Government for these purposes.

(2) To use, duplicate, and disclose data furnished under this clause, in accordance with subparagraph (h)(1) of this clause, in precedence over any other clause of this contract providing for rights in data.

(3) The Government is not precluded from using similar or identical data acquired from other sources. (End of clause)

57. *FAR 52.223-5 POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (AUG 2003) [For Work on Federal Facilities]

(a) *Definitions*. As used in this clause—

"Priority chemical" means a chemical identified by the Interagency Environmental Leadership Workgroup or, alternatively, by an agency pursuant to Section 503 of Executive Order 13148 of April 21, 2000, Greening the Government through Leadership in Environmental Management.

"Toxic chemical" means a chemical or chemical category listed in 40 CFR 372.65.

(b) Executive Order 13148 requires Federal facilities to comply with the provisions of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11001-11050) and the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13101-13109).

(c) The Contractor shall provide all information needed by the Federal facility to comply with the following:

(1) The emergency planning reporting requirements of Section 302 of EPCRA.
(2) The emergency notice requirements of Section 304 of EPCRA.
(3) The list of Material Safety Data Sheets, required by Section 311 of EPCRA.
(4) The emergency and hazardous chemical inventory forms of Section 312 of EPCRA.
(5) The toxic chemical release inventory of Section 313 of EPCRA, which includes the reduction and recycling information required by Section 6607 of PPA.
(6) The toxic chemical, priority chemical, and hazardous substance release and use reduction goals of Sections 502 and 503 of Executive Order 13148.

(End of clause)

58. *FAR 52.223-6 DRUG-FREE WORKPLACE (MAY 2001)

(a) Definitions. As used in this clause--

"Controlled substance" means a controlled substance in schedules I through V of section 202 of the Controlled Substances Act (21 U.S.C. 812) and as further defined in regulation at 21 CFR 1308.11 - 1308.15.

"Conviction" means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes.

"Criminal drug statute" means a Federal or non-Federal criminal statute involving the manufacture, distribution, dispensing, possession or use of any controlled substance.

"Drug-free workplace" means the site(s) for the performance of work done by the Contractor in connection with a specific contract where employees of the Contractor are prohibited from engaging in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance.

"Employee" means an employee of a Contractor directly engaged in the performance of work under a Government contract. "Directly engaged" is defined to include all direct cost employees and any other Contractor employee who has other than a minimal impact or involvement in contract performance.

"Individual" means an offeror/contractor that has no more than one employee including the offeror/contractor.

(b) The Contractor, if other than an individual, shall--within 30 days after award (unless a longer period is agreed to in writing for contracts of 30 days or more performance duration), or as soon as possible for contracts of less than 30 days performance duration--

(1) Publish a statement notifying its employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition;

(2) Establish an ongoing drug-free awareness program to inform such employees about--

(i) The dangers of drug abuse in the workplace;

(ii) The Contractor's policy of maintaining a drug-free workplace;

(iii) Any available drug counseling, rehabilitation, and employee assistance programs; and

(iv) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.

(3) Provide all employees engaged in performance of the contract with a copy of the statement required by subparagraph (b)(1) of this clause;

(4) Notify such employees in writing in the statement required by subparagraph (b)(1) of this clause that, as a condition of continued employment on this contract, the employee will--

(i) Abide by the terms of the statement; and

(ii) Notify the employer in writing of the employee's conviction under a criminal drug statute for a violation occurring in the workplace no later than 5 days after such conviction.

(5) Notify the Contracting Officer in writing within 10 days after receiving notice under subdivision (b)(4)(ii) of this clause, from an employee or otherwise receiving actual notice of such conviction. The notice shall include the position title of the employee;

(6) Within 30 days after receiving notice under subdivision (b)(4)(ii) of this clause of a conviction, take one of the following actions with respect to any employee who is convicted of a drug abuse violation occurring in the workplace:

(i) Taking appropriate personnel action against such employee, up to and including termination; or

(ii) Require such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency; and

(7) Make a good faith effort to maintain a drug-free workplace through implementation of subparagraphs (b)(1) through (b)(6) of this clause.

(c) The Contractor, if an individual, agrees by award of the contract or acceptance of a purchase order, not to engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance while performing this contract.

(d) In addition to other remedies available to the Government, the Contractor's failure to comply with the requirements of paragraph (b) or (c) of this clause may, pursuant to FAR 23.560, render the Contractor subject to suspension of contract payments, termination of the contract for default, and suspension or debarment.

59. FAR 52.223-9 ESTIMATE OF PERCENTAGE OF RECOVERED MATERIAL CONTENT FOR EPA-DESIGNATED PRODUCTS (AUG 2000) [For Contracts exceeding $100,000. EPA Designated product (available at http://www.epa.gov/cpg/)]

(a) Definitions. As used in this clause—

"Postconsumer material" means a material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item. Postconsumer material is a part of the broader category of "recovered material."

"Recovered material" means waste materials and by-products recovered or diverted from solid waste, but the term does not include those materials and by-products generated from, and commonly reused within, an original manufacturing process.

(b) The Contractor, on completion of this contract, shall—

(1) Estimate the percentage of the total recovered material used in contract performance, including, if applicable, the percentage of postconsumer material content; and

(2) Submit this estimate to the Contracting Officer.

(End of clause)

60. *FAR 52.223-14 TOXIC CHEMICAL RELEASE REPORTING (AUG 2003)
[For Contracts Over $100,000]

(a) Unless otherwise exempt, the Contractor, as owner or operator of a facility used in the performance of this contract, shall file by July 1 for the prior calendar year an annual Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023(a) and (g)), and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106). The Contractor shall file, for each facility subject to the Form R filing and reporting requirements, the annual Form R throughout the life of the contract.

(b) A Contractor-owned or -operated facility used in the performance of this contract is exempt from the requirement to file an annual Form R if—

(1) The facility does not manufacture, process, or otherwise use any toxic chemicals listed in 40 CFR 372.65;

(2) The facility does not have 10 or more full-time employees as specified in section 313(b)(1)(A) of EPCRA, 42 U.S.C. 11023(b)(1)(A);

(3) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

(4) The facility does not fall within the following Standard Industrial Classification (SIC) codes or their corresponding North American Industry Classification System sectors:

(i) Major group code 10 (except 1011, 1081, and 1094.

(ii) Major group code 12 (except 1241).

(iii) Major group codes 20 through 39.

(iv) Industry code 4911, 4931, or 4939 (limited to facilities that combust coal and/or oil for the purpose of generating power for distribution in commerce).

(v) Industry code 4953 (limited to facilities regulated under the Resource Conservation and Recovery Act, Subtitle C (42 U.S.C. 6921, *et seq*.)), or 5169, or 5171, or 7389 (limited to facilities primarily engaged in solvent recovery services on a contract or fee basis); or

(5) The facility is not located in the United States or its outlying areas.

(c) If the Contractor has certified to an exemption in accordance with one or more of the criteria in paragraph (b) of this clause, and after award of the contract circumstances change so that any of its owned or operated facilities used in the performance of this contract is no longer exempt—

(1) The Contractor shall notify the Contracting Officer; and

(2) The Contractor, as owner or operator of a facility used in the performance of this contract that is no longer exempt, shall—

(i) Submit a Toxic Chemical Release Inventory Form (Form R) on or before July 1 for the prior calendar year during which the facility becomes eligible; and

(ii) Continue to file the annual Form R for the life of the contract for such facility.

(d) The Contracting Officer may terminate this contract or take other action as appropriate, if the Contractor fails to comply accurately and fully with the EPCRA and PPA toxic chemical release filing and reporting requirements.

(e) Except for acquisitions of commercial items as defined in FAR Part 2, the Contractor shall—

(1) For competitive subcontracts expected to exceed $100,000 (including all options), include a solicitation provision substantially the same as the provision at FAR 52.223-13, Certification of Toxic Chemical Release Reporting; and

(2) Include in any resultant subcontract exceeding $100,000 (including all options), the substance of this clause, except this paragraph (e).

(End of clause)

61. DFARS 252.223-7006 PROHIBITION ON STORAGE AND DISPOSAL OF TOXIC AND

HAZARDOUS MATERIALS (APR 1993)

(a) Definitions. As used in this clause--

(1) "Storage" means a non-transitory, semi-permanent or permanent holding, placement, or leaving of material. It does not include a temporary accumulation of a limited quantity of a material used in or a waste generated or resulting from authorized activities, such as servicing, maintenance, or repair of Department of Defense (DoD) items, equipment, or facilities.

(2) "Toxic or hazardous materials" means:

(i) Materials referred to in section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 U.S.C. 9601(14)) and materials designated under section 102 of CERCLA (42 U.S.C. 9602) (40 CFR Part 302);

(ii) Materials that are of an explosive, flammable, or pyrotechnic nature; or

(iii) Materials otherwise identified by the Secretary of Defense as specified in DoD regulations.

(b) In accordance with 10 U.S.C. 2692, the Contractor is prohibited from storing or disposing of non-DoD-owned toxic or hazardous materials on a DoD installation, except to the extent authorized by a statutory exception to 10 U.S.C. 2692 or as authorized by the Secretary of Defense or his designee.

62. *FAR 52.225-9 BUY AMERICAN ACT—CONSTRUCTION MATERIALS (JUNE 2003) (<u>For Contracts less than $6.481 million</u>)

(a) *Definitions*. As used in this clause—

"Component" means an article, material, or supply incorporated directly into a construction material.

"Construction material" means an article, material, or supply brought to the construction site by the Contractor or a subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

"Cost of components" means—

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the construction material (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.

"Domestic construction material" means—

(1) An unmanufactured construction material mined or produced in the United States; or

(2) A construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic.

"Foreign construction material" means a construction material other than a domestic construction material.

"United States" means the 50 States and the District of Columbia, and outlying areas.

(b) *Domestic preference*. (1) This clause implements the Buy American Act (41 U.S.C. 10a - 10d) by providing a preference for domestic construction material. The Contractor shall use only domestic construction material in performing this contract, except as provided in paragraphs (b)(2) and (b)(3) of this clause.

(2) This requirement does not apply to the construction material or components listed by the

Government as follows:

_____

[*Contracting Officer to list applicable excepted materials or indicate "none"*]

(3) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(2) of this clause if the Government determines that—

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the requirements of the Buy American Act is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent;

(ii) The application of the restriction of the Buy American Act to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) *Request for determination of inapplicability of the BuyAmerican Act*. (1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(3) of this clause shall include adequate information for Government evaluation of the request, including—

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

(D) Price;

(E) Time of delivery or availability;

(F) Location of the construction project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.

(iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).

(iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to the Buy American Act applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(3)(i) of this clause.

(3) Unless the Government determines that an exception to the Buy American Act applies, use of foreign construction material is noncompliant with the Buy American Act.

(d) *Data*. To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

FOREIGN AND DOMESTIC CONSTRUCTION MATERIALS PRICE COMPARISON			
Construction Material Description	Unit of Measure	Quantity	Price (Dollars)*
Item 1:			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____
Item 2:			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____

[List *name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.]*
[Include other applicable supporting information.]
[Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued).]*

63. *FAR 52.225-10 NOTICE OF BUY AMERICAN ACT REQUIREMENT—CONSTRUCTION MATERIALS (MAY 2002) (Applicable with FAR 52.225-9)

(a) *Definitions*. "Construction material," "domestic construction material," and "foreign construction material," as used in this provision, are defined in the clause of this solicitation entitled "Buy American Act—Construction Materials" (Federal Acquisition Regulation (FAR) clause 52.225-9).

(b) *Requests for determinations of inapplicability*. An offeror requesting a determination regarding the inapplicability of the Buy American Act should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of the clause at FAR 52.225-9 in the request. If an offeror has not requested a determination regarding the inapplicability of the Buy American Act before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) *Evaluation of offers*. (1) The Government will evaluate an offer requesting exception to the requirements of the Buy American Act, based on claimed unreasonable cost of domestic construction material, by adding to the offered price the appropriate percentage of the cost of such foreign construction material, as specified in paragraph (b)(3)(i) of the clause at FAR 52.225-9.

(2) If evaluation results in a tie between an offeror that requested the substitution of foreign construction material based on unreasonable cost and an offeror that did not request an exception, the Contracting Officer will award to the offeror that did not request an exception based on unreasonable cost.

(d) *Alternate offers*. (1) When an offer includes foreign construction material not listed by the Government in this solicitation in paragraph (b)(2) of the clause at FAR 52.225-9, the offeror also may submit an alternate offer based on use of equivalent domestic construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of the clause at FAR 52.225-9 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of the clause at FAR 52.225-9 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic construction material, and the offeror shall be required to furnish such domestic construction material. An offer based on use of the foreign construction material for which an exception was requested—

(i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or
(ii) May be accepted if revised during negotiations.

(End of provision)

64. *FAR 52.225-11 BUY AMERICAN ACT—CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (JUNE 2004) [For Contracts more than $6,481,000] ALTERNATE I (JAN 2004) [<u>For Contracts between $6.481 and 7.304733 Million</u>]

(a) *Definitions*. As used in this clause—

"Component" means an article, material, or supply incorporated directly into a construction material.

"Construction material" means an article, material, or supply brought to the construction site by the Contractor or subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as

emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

"Cost of components" means—

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the construction material (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.

"Designated country" means any of the following countries:

Aruba	Kiribati
Austria	Korea, Republic of
Bangladesh	Latvia
Belgium	Lesotho
Benin	Liechtenstein
Bhutan	Lithuania
Botswana	Luxembourg
Burkina Faso	Malawi
Burundi	Maldives
Canada	Mali
Cape Verde	Malta
Central African Republic	Mozambique
	Nepal
Chad	Netherlands
Comoros	Niger
Cyprus	Norway
Czech Republic	Poland
Denmark	Portugal
Djibouti	Rwanda
Equatorial Guinea	Sao Tome and Principe
Estonia	Sierra Leone
Finland	Singapore
France	Slovak Republic
Gambia	Slovenia
Germany	Somalia
Greece	Spain
Guinea	Sweden
Guinea-Bissau	Switzerland
Haiti	Tanzania U.R.
Hong Kong	Togo
Hungary	Tuvalu
Iceland	Uganda
Ireland	United Kingdom
Israel	Vanuatu
Italy	Western Samoa
Japan	Yemen

"Designated country construction material" means a construction material that—

(1) Is wholly the growth, product, or manufacture of a designated country; or

(2) In the case of a construction material that consists in whole or in part of materials from another

country, has been substantially transformed in a designated country into a new and different construction material distinct from the materials from which it was transformed.

"Domestic construction material" means—

(1) An unmanufactured construction material mined or produced in the United States; or

(2) A construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic.

"Foreign construction material" means a construction material other than a domestic construction material.

"Free Trade Agreement country" means Canada, Chile, Mexico, or Singapore.

"Free Trade Agreement country construction material" means a construction material that—

(1) Is wholly the growth, product, or manufacture of a Free Trade Agreement (FTA) country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a FTA country into a new and different construction material distinct from the materials from which it was transformed.

"United States" means the 50 States and the District of Columbia, and outlying areas.

(b) *Construction materials*. (1) This clause implements the Buy American Act (41 U.S.C. 10a–10d) by providing a preference for domestic construction material. In addition, the Contracting Officer has determined that the Trade Agreements Act and Free Trade Agreements (FTAs) apply to this acquisition.
Therefore, the Buy American Act restrictions are waived for designated country and FTA country construction materials.

(2) The Contractor shall use only domestic, designated country, or FTA country construction material in performing this contract, except as provided in paragraphs (b)(3) and (b)(4) of this clause.

(3) The requirement in paragraph (b)(2) of this clause does not apply to the construction materials or components listed by the Government as follows:

_____

[*Contracting Officer to list applicable excepted materials or indicate "none"*]

(4) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(3) of this clause if the Government determines that—

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the restrictions of the Buy American Act is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent;

(ii) The application of the restriction of the Buy American Act to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) *Request for determination of inapplicability of the Buy American Act*. (1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(4) of this clause shall include adequate information for Government evaluation of the request, including—

(A) A description of the foreign and domestic construction materials;
(B) Unit of measure;
(C) Quantity;
(D) Price;
(E) Time of delivery or availability;
(F) Location of the construction project;
(G) Name and address of the proposed supplier; and
(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.

(iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).

(iv) Any Contractor request for a determination submitted after contract award shall

explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to the Buy American Act applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(4)(i) of this clause.

(3) Unless the Government determines that an exception to the Buy American Act applies, use of foreign construction material is noncompliant with the Buy American Act.

(d) *Data*. To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

FOREIGN AND DOMESTIC CONSTRUCTION MATERIALS PRICE COMPARISON			
Construction Material Description	Unit of Measure	Quantity	Price (Dollars)*
Item 1:			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____
Item 2:			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____

[List *name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.] [Include other applicable supporting information.]*
[Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued).]*

(e) United States law will apply to resolve any claim of breach of this contract.

(End of clause)

Alternate I (Jan 2004). As prescribed in 25.1102(c)(3), delete the definitions of ''Free Trade Agreement country'' and ''Free Trade Agreement country construction material'' from the definitions in paragraph (a) of the basic clause, add the following definition of ''Chilean construction material'' to paragraph (a) of the basic clause, and substitute the following paragraphs (b)(1) and (b)(2) for paragraphs (b)(1) and (b)(2) of the basic clause:

"Chilean construction material" means a construction material that—

(1) Is wholly the growth, product, or manufacture of Chile; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in Chile into a new and different construction material distinct from the materials from which it was transformed.

(b) *Construction materials.* (1) This clause implements the Buy American Act (41 U.S.C. 10a–10d) by providing a preference for domestic construction material. In addition, the Contracting Officer has determined that the Trade Agreements Act, the Chile Free Trade Agreement, and the Singapore Free Trade Agreement apply to this acquisition. Therefore, the Buy American Act restrictions are waived for designated country and Chilean construction materials.

(2) The Contractor shall use only domestic, designated country, or Chilean construction material in performing this contract, except as provided in paragraphs (b)(3) and (b)(4) of this clause.

65. *FAR 52.225-12 NOTICE OF BUY AMERICAN ACT REQUIREMENT—CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (JAN 2004) [Applicable with FAR 52.225-11] ALTERNATE II (JAN 2004) [For Contracts Between 6.481 and 7.344733 Million]

(a) *Definitions.* "Construction material," "designated country construction material," "domestic construction material," "foreign construction material," and "FTA country construction material," as used in this provision, are defined in the clause of this solicitation entitled "Buy American Act—
Construction Materials under Trade Agreements" (Federal Acquisition Regulation (FAR) clause 52.225-11).

(b) *Requests for determination of inapplicability*. An offeror requesting a determination regarding the inapplicability of the Buy American Act should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of FAR clause 52.225-11 in the request. If an offeror has not requested a determination regarding the inapplicability of the Buy American Act before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) *Evaluation of offers*. (1) The Government will evaluate an offer requesting exception to the requirements of the Buy American Act, based on claimed unreasonable cost of domestic construction materials, by adding to the offered price the appropriate percentage of the cost of such foreign construction material, as specified in paragraph (b)(4)(i) of FAR clause 52.225-11.

(2) If evaluation results in a tie between an offeror that requested the substitution of foreign construction material based on unreasonable cost and an offeror that did not request an exception, the Contracting Officer will award to the offeror that did not request an exception based on unreasonable cost.

(d) *Alternate offers*. (1) When an offer includes foreign construction material, other than designated country or FTA country construction material, that is not listed by the Government in this solicitation in paragraph (b)(3) of FAR clause 52.225-11, the offeror also may submit an alternate offer based on use of equivalent domestic, designated country, or FTA country construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of FAR clause 52.225-11 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of FAR clause 52.225-11 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic, designated country, or FTA country construction material, and the offeror shall be required to furnish such domestic, designated country, or FTA country construction material. An offer based on use of the foreign construction material for which an exception was requested—

(i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or

(ii) May be accepted if revised during negotiations.

(End of provision)

ALTERNATE II (JAN 2004) **[For Contracts between 6.481 and 7.304733 Million]**
As prescribed in 25.1102(d)(3), substitute the following paragraphs (a) and (d) for paragraphs (a) and (d) of the basic provision:

(a) Definitions. *Chilean construction material, construction material, designated country construction material, domestic construction material*, and *foreign construction material*, as used in this provision, are defined in the clause of this solicitation entitled ''Buy American Act—Construction Materials Under Trade Agreements'' (Federal Acquisition Regulation (FAR) clause 52.225–11).

(d) *Alternate offers*. (1) When an offer includes foreign construction material, other than designated country or Chilean construction material, that is not listed by the Government in this solicitation in paragraph (b)(3) of FAR clause 52.225–11, the offeror also may submit an alternate offer based on use of equivalent domestic,

designated country, or Chilean construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of FAR clause 52.225-11 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of FAR clause 52.225–11 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic, designated country, or Chilean construction material, and the offeror shall be required to furnish such domestic, designated country, or Chilean construction material. An offer based on use of the foreign construction material for which an exception was requested—

(i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or
(ii) May be accepted if revised during negotiations.

66. *FAR 52.225-13 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (DEC 2003)

(a) Except as authorized by the Office of Foreign Assets Control (OFAC) in the Department of the Treasury, the Contractor shall not acquire, for use in the performance of this contract, any supplies or services if any proclamation, Executive order, or statute administered by OFAC, or if OFAC's implementing regulations at 31 CFR chapter V, would prohibit such a transaction by a person subject to the jurisdiction of the United States.

(b) Except as authorized by OFAC, most transactions involving Cuba, Iran, Libya, and Sudan are prohibited, as are most imports from North Korea, into the United States or its outlying areas. Lists of entities and individuals subject to economic sanctions are included in OFAC's List of Specially Designated Nationals and Blocked Persons at *http://www.epls.gov/TerList1.html*. More information about these restrictions, as well as updates, is available in the OFAC's regulations at 31 CFR chapter V and/or on OFAC's website at *http://www.treas.gov/ofac*.

(c) The Contractor shall insert this clause, including this paragraph (c), in all subcontracts.
(End of clause)

67. DFARS 252.226-7001 UTILIZATION OF INDIAN ORGANIZATIONS, INDIAN-OWNED ECONOMIC ENTERPRISES, AND NATIVE HAWAIIAN SMALL BUSINESS CONCERNS (OCT 2003)

(a) *Definitions.* As used in this clause--

"Indian" means any person who is a member of any Indian tribe, band, group, pueblo, or community that is recognized by the Federal Government as eligible for services from the Bureau of Indian Affairs (BIA) in accordance with 25 U.S.C. 1452(c) and any "Native" as defined in the Alaska Native Claims Settlement Act (43 U.S.C. 1601).

"Indian organization" means the governing body of any Indian tribe or entity established or recognized by the governing body of an Indian tribe for the purposes of 25 U.S.C. Chapter 17.

"Indian-owned economic enterprise" means any Indian-owned (as determined by the Secretary of the Interior) commercial, industrial, or business activity established or organized for the purpose of profit, provided that Indian ownership constitutes not less than 51 percent of the enterprise.

"Indian tribe" means any Indian tribe, band, group, pueblo, or community, including native villages and native groups (including corporations organized by Kenai, Juneau, Sitka, and Kodiak) as defined in the Alaska Native Claims Settlement Act, that is recognized by the Federal Government as eligible for services from BIA in accordance with 25 U.S.C. 1452(c).

"Interested party" means a contractor or an actual or prospective offeror whose direct economic interest would be affected by the award of a subcontract or by the failure to award a subcontract.

"Native Hawaiian small business concern" means an entity that is-

(1) A small business concern as defined in Section 3 of the Small Business Act (15 U.S.C. 632) and relevant implementing regulations; and

(2) Owned and controlled by a Native Hawaiian as defined in 25 U.S.C. 4221(9).

(b) The Contractor shall use its best efforts to give Indian organizations, Indian-owned economic enterprises, and Native Hawaiian small business concerns the maximum practicable opportunity to participate in the subcontracts it awards, to the fullest extent consistent with efficient performance of the contract.

(c) The Contracting Officer and the Contractor, acting in good faith, may rely on the representation of an Indian organization, Indian-owned economic enterprise, or Native Hawaiian small business concern as to its eligibility, unless an interested party challenges its status or the Contracting Officer has independent reason to question that status.

(d) In the event of a challenge to the representation of a subcontractor, the Contracting Officer will refer the matter to-

(1) For matters relating to Indian organizations or Indian-owned economic enterprises:

U.S. Department of the Interior
Bureau of Indian Affairs
Attn: Chief, Division of Contracting and
Grants Administration
1849 C Street NW, MS-2626-MIB
Washington, DC 20240-4000.

The BIA will determine the eligibility and will notify the Contracting Officer.

(2) For matters relating to Native Hawaiian small business concerns:

Department of Hawaiian Home Lands
PO Box 1879
Honolulu, HI 96805.

The Department of Hawaiian Home Lands will determine the eligibility and will notify the Contracting Officer.

(e) No incentive payment will be made-

(1) While a challenge is pending; or

(2) If a subcontractor is determined to be an ineligible participant.

(f)(1) The Contractor, on its own behalf or on behalf of a subcontractor at any tier, may request an incentive payment in accordance with this clause.

(2) The incentive amount that may be requested is 5 percent of the estimated cost, target cost, or fixed price included in the subcontract at the time of award to the Indian organization, Indian-owned economic enterprise, or Native Hawaiian small business concern.

(3) In the case of a subcontract for commercial items, the Contractor may receive an incentive payment only if the subcontracted items are produced or manufactured in whole or in part by an Indian organization, Indian-owned economic enterprise, or Native Hawaiian small business concern.

(4) The Contractor has the burden of proving the amount claimed and shall assert its request for an incentive payment prior to completion of contract performance.

(5) The Contracting Officer, subject to the terms and conditions of the contract and the availability of funds, will authorize an incentive payment of 5 percent of the estimated cost, target cost, or fixed price included in the subcontract awarded to the Indian organization, Indian-owned economic enterprise, or Native Hawaiian small business concern.

(6) If the Contractor requests and receives an incentive payment on behalf of a subcontractor, the

Contractor is obligated to pay the subcontractor the incentive amount.

(g) The Contractor shall insert the substance of this clause, including this paragraph (g), in all subcontracts exceeding $500,000 for which further subcontracting opportunities may exist.

(End of clause)

68. *FAR 52.227-1 AUTHORIZATION AND CONSENT (JUL 1995)

(a) The Government authorizes and consents to all use and manufacture, in performing this contract or any subcontract at any tier, of any invention described in and covered by a United States patent

(1) embodied in the structure or composition of any article the delivery of which is accepted by the Government under this contract or

(2) used in machinery, tools, or methods whose use necessarily results from compliance by the Contractor or a subcontractor with

(i) specifications or written provisions forming a part of this contract or

(ii) specific written instructions given by the Contracting Officer directing the manner of performance. The entire liability to the Government for infringement of a patent of the United States shall be determined solely by the provisions of the indemnity clause, if any, included in this contract or any subcontract hereunder (including any lower-tier subcontract), and the Government assumes liability for all other infringement to the extent of the authorization and consent hereinabove granted.

(b) The Contractor agrees to include, and require inclusion of, this clause, suitably modified to identify the parties, in all subcontracts at any tier for supplies or services (including construction, architect-engineer services, and materials, supplies, models, samples, and design or testing services expected to exceed the simplified acquisition threshold) however, omission of this clause from any subcontract, including those at or below the simplified acquisition threshold, does not affect this authorization and consent.

69. *FAR 52.227-2 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG 1996)

(a) The Contractor shall report to the Contracting Officer, promptly and in reasonable written detail, each notice or claim of patent or copy-right infringement based on the performance of this contract of which the Contractor has knowledge.

(b) In the event of any claim or suit against the Government on account of any alleged patent or copyright infringement arising out of the performance of this contract or out of the use of any supplies furnished or work or services performed under this contract, the Contractor shall furnish to the Government, when requested by the Contracting Officer, all evidence and information in possession of the Contractor pertaining to such suit or claim. Such evidence and information shall be furnished at the expense of the Government except where the Contractor has agreed to indemnify the Government.

(c) The Contractor agrees to include, and require inclusion of, this clause in all subcontracts at any tier for supplies or services (including construction and architect-engineer subcontracts and those for material, supplies, models, samples, or design or testing services) expected to exceed the simplified acquistion threshold at FAR 2.101.

70. *FAR 52.227-4 PATENT INDEMNITY--CONSTRUCTION CONTRACTS (APR 1984)

Except as otherwise provided, the Contractor agrees to indemnify the Government and its officers, agents, and employees against liability, including costs and expenses, for infringement upon any United States patent (except a patent issued upon an application that is now or may hereafter be withheld from issue pursuant to a Secrecy Order under 35 U.S.C. 181) arising out of performing this contract or out of the use or disposal by or for the account of the Government of supplies furnished or work performed under this contract.

71. DFARS 252.227-7022 GOVERNMENT RIGHTS (UNLIMITED) (MAR 1979)

The Government shall have unlimited rights, in all drawings, designs, specifications, notes and other works developed in the performance of this contract, including the right to use same on any other Government design or construction without additional compensation to the Contractor. The Contractor hereby grants to the Government a paid-up license throughout the world to all such works to which he may assert or establish any claim under design patent or copyright laws. The Contractor for a period of three (3) years after completion of the project agrees to furnish the original or copies of all such works on the request of the Contracting Officer. (End of clause)

72. DFARS 252.227-7023 DRAWINGS AND OTHER DATA TO BECOME PROPERTY OF GOVERNMENT (MAR 1979)

All designs, drawings, specifications, notes and other works developed in the performance of this contract shall become the sole property of the Government and may be used on any other design or construction without additional compensation to the Contractor. The Government shall be considered the "person for whom the work was prepared" for the purpose of authorship in any copyrightable work under 17 U.S.C. 201(b). With respect thereto, the Contractor agrees not to assert or authorize others to assert any rights nor establish any claim under the design patent or copyright laws. The Contractor for a period of three (3) years after completion of the project agrees to furnish all retained works on the request of the Contracting Officer. Unless otherwise provided in this contract, the Contractor shall have the right to retain copies of all works beyond such period.

73. DFARS 252.227-7033 RIGHTS IN SHOP DRAWINGS (APR 1966)

(a) Shop drawings for construction means drawings, submitted to the Government by the Construction Contractor, subcontractor or any lower-tier subcontractor pursuant to a construction contract, showing in detail

(i) the proposed fabrication and assembly of structural elements and (ii) the installation (i.e., form, fit, and attachment details) of materials or equipment. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(b) This clause, including this paragraph (b), shall be included in all subcontracts hereunder at any tier.

74. *FAR 52.228-2 ADDITIONAL BOND SECURITY (OCT 1997)

The Contractor shall promptly furnish additional security required to protect the Government and persons supplying labor or materials under this contract if--

(a) Any surety upon any bond, or issuing financial institution for other security, furnished with this contract becomes unacceptable to the Government;

(b) Any surety fails to furnish reports on its financial condition as required by the Government;

(c) The contract price is increased so that the penal sum of any bond becomes inadequate in the opinion of the Contracting Officer; or

(d) An irrevocable letter of credit (ILC) used as security will expire before the end of the period of required security. If the Contractor does not furnish an acceptable extension or replacement ILC, or other acceptable substitute, at least 30 days before an ILC's scheduled expiration, the Contracting Officer has the right to immediately draw on the ILC.

75. *FAR 52.228-5 INSURANCE--WORK ON A GOVERNMENT INSTALLATION (JAN 1997) [For Contracts Exceeding $100,000]

(a) The Contractor shall, at its own expense, provide and maintain during the entire performance of this contract, at least the kinds and minimum amounts of insurance required in the Schedule or elsewhere in the contract.

(b) Before commencing work under this contract, the Contractor shall notify the Contracting Officer in writing that the required insurance has been obtained. The policies evidencing required insurance shall contain an endorsement to the effect that any cancellation or any material change adversely affecting the Government's interest shall not be effective

(1) for such period as the laws of the State in which this contract is to be performed prescribe, or

(2) until 30 days after the insurer or the Contractor gives written notice to the Contracting Officer, whichever period is longer.

(c) The Contractor shall insert the substance of this clause, including this paragraph (c), in subcontracts under this contract that require work on a Government installation and shall require subcontractors to provide and maintain the insurance required in the Schedule or elsewhere in the contract. The Contractor shall maintain a copy of all subcontractors' proofs of required insurance, and shall make copies available to the Contracting Officer upon request.

76. *FAR 52.228-11 PLEDGES OF ASSETS (FEB 1992)

(a) Offerors shall obtain from each person acting as an individual surety on a bid guarantee, a performance bond, or a payment bond--

(1) Pledge of assets; and

(2) Standard Form 28, Affidavit of Individual Surety.

(b) Pledges of assets from each person acting as an individual surety shall be in the form of--

(1) Evidence of an escrow account containing cash, certificates of deposit, commercial or Government securities, or other assets described in FAR 28.203-2 (except see 28.203-2(b)(2) with respect to Government securities held in book entry form) and/or;

(2) A recorded lien on real estate. The offeror will be required to provide--

(i) Evidence of title in the form of a certificate of title prepared by a title insurance company approved by the United States Department of Justice. This title evidence must show fee simple title vested in the surety along with any concurrent owners; whether any real estate taxes are due and payable; and any recorded encumbrances against the property, including the lien filed in favor of the Government as required by FAR 28.203-3(d);

(ii) Evidence of the amount due under any encumbrance shown in the evidence of title;

(iii) A copy of the current real estate tax assessment of the property or a current appraisal dated no earlier than 6 months prior to the date of the bond, prepared by a professional appraiser who certifies that the appraisal has been conducted in accordance with the generally accepted appraisal standards as reflected in the Uniform Standards of Professional Appraisal Practice, as promulgated by the Appraisal Foundation.

77. *FAR 52.228-12 PROSPECTIVE SUBCONTRACTOR REQUESTS FOR BONDS (OCT 1995)

In accordance with Section 806(a)(3) of Public Law 102-190, as amended by Sections 2091 and 8105 of Pub. L. 103-355, upon the request of a prospective subcontractor or supplier offering to furnish labor or material for the performance of this contract for which a payment bond has been furnished to the Government pursuant to the Miller Act, the Contractor shall promptly provide a copy of such payment bond to the requestor.

78. FAR 52.228-14 IRREVOCABLE LETTER OF CREDIT (DEC 1999)

(a) "Irrevocable letter of credit" (ILC), as used in this clause, means a written commitment by a federally insured financial institution to pay all or part of a stated amount of money, until the expiration date of the letter, upon presentation by the Government (the beneficiary) of a written demand therefor. Neither the financial institution nor the offeror/Contractor can revoke or condition the letter of credit.

(b) If the offeror intends to use an ILC in lieu of a bid bond, or to secure other types of bonds such as performance and payment bonds, the letter of credit and letter of confirmation formats in paragraphs (e) and (f) of this clause shall be used.

(c) The letter of credit shall be irrevocable, shall require presentation of no document other than a written demand and the ILC (including confirming letter, if any), shall be issued/confirmed by an acceptable federally insured financial institution as provided in paragraph (d) of this clause, and--

(1) If used as a bid guarantee, the ILC shall expire no earlier than 60 days after the close of the bid acceptance period;

(2) If used as an alternative to corporate or individual sureties as security for a performance or payment bond, the offeror/Contractor may submit an ILC to cover the entire period of performance or may submit an ILC with an initial expiration date estimated to cover the entire period for which financial security is required or may submit an ILC with an an initial expiration that is a minimum period of one year from the date of issuance. The ILC shall provide that, unless the issuer provides the beneficiary written notice of non-renewal of least 60 days in advance of the current expiration date, the ILC is automatically extended without amendment for one year from the expiration date, or any future expiration date, until the period of required coverage is completed and the Contracting Officer provides the financial institution with a written statement waiving the right to payment. The period of required coverage shall be:

(i) For contracts subject to the Miller Act, the later of--

(A) One year following the expected date of final payment;

(B) For performance bonds only, until completion of any warranty period; or

(C) For payment bonds only, until resolution of all claims filed against the payment bond during the one-year period following final payment.

(ii) For contracts not subject to the Miller Act, the later of--

(A) 90 days following final payment; or

(B) For performance bonds only, until completion of any warranty period.

(d) Only federally insured financial institution rated investment grade or higher shall issue or confirm the ILC. The offeror/Contractor shall provide the Contracting Officer a credit rating that indicates the financial institution has the required rating(s) as of the date of issuance of the ILC. Unless the financial institution issuing the ILC had letter of credit business of at least $25 million in the past year, ILCs over $5 million must be confirmed by another acceptable financial institution that had letter of credit business of at least $25 million in the past year.

(e) The following format shall be used by the issuing financial institution to create an ILC:

[Issuing Financial Institution's Letterhead or Name and Address]

Issue Date ----------

Irrevocable Letter of Credit No.----------
Account party's name----------
Account party's address----------
For Solicitation No.----------
(For reference only)

TO: [U.S. Government agency]
[U.S. Government agency's address]

1. We hereby establish this irrevocable and transferable Letter of Credit in your favor for one or more drawings up to United States $_____. This Letter of Credit is payable at [issuing financial institution's and, if any, confirming financial institution's] office at [issuing financial institution's address and, if any, confirming financial institution's address] and expires with our close of business on _____, or any automatically extended expiration date.

2. We hereby undertake to honor your or transferee's sight draft(s) drawn on issuing or, if any, the confirming financial institution, for all or any part of this credit if presented with this Letter of Credit and confirmation, if any, at the office specified in paragraph 1 of this Letter of Credit on or before the expiration date or any automatically extended expiration date.

3. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this Letter of Credit that it is deemed to be automatically extended without amendment for one year from the expiration date hereof, or any future expiration date, unless at least 60 days prior to any expiration date, we notify you or the transferee by registered mail, or other receipted means of delivery, that we elect not to consider this Letter of Credit renewed for any such additional period. At the time we notify you, we also agree to notify the account party (and confirming financial institution, if any) by the same means of delivery.

4. This Letter of Credit is transferable. Transfers and assignments of proceeds are to be effected without charge to either the beneficiary or the transferee/assignee of proceeds. Such transfer or assignment shall be only at the written direction of the Government (the beneficiary) in a form satisfactory to the issuing financial institution and the confirming financial institution, if any.

5. This Letter of Credit is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. 500, and to the extent not inconsistent therewith, to the laws of _____ [state of confirming financial institution, if any, otherwise state of issuing financial institution].

6. If this credit expires during an interruption of business of this financial institution as described in Article 17 of the UCP, the financial institution specifically agrees to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

[Issuing financial institution]

(f) The following format shall be used by the financial institution to confirm an ILC:

[Confirming Financial Institution's Letterhead or Name and Address]---

(Date)_____

Our Letter of Credit
Advice Number----------
Beneficiary:----------
[U.S. Government agency]
Issuing Financial Institution:----------
Issuing Financial Institution's LC No.:----------

Gentlemen:

1. We hereby confirm the above indicated Letter of Credit, the original of which is attached, issued by _____ [name of issuing financial institution] for drawings of up to United States dollars _____/U.S. $_____ and expiring with our close of business on _____ [the expiration date], or any automatically extended expiration date.

2. Draft(s) drawn under the Letter of Credit and this Confirmation are payable at our office located at _____.

3. We hereby undertake to honor sight draft(s) drawn under and presented with the Letter of Credit and this Confirmation at our offices as specified herein.

4. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this confirmation that it be deemed automatically extended without amendment for one year from the expiration date hereof, or any automatically extended expiration date, unless:

(a) At least 60 days prior to any such expiration date, we shall notify the Contracting Officer, or the transferee and the issuing financial institution, by registered mail or other receipted means of delivery, that we elect not to consider this confirmation extended for any such additional period; or

(b) The issuing financial institution shall have exercised its right to notify you or the transferee, the account party, and ourselves, of its election not to extend the expiration date of the Letter of Credit.

5. This confirmation is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. 500, and to the extent not inconsistent therewith, to the laws of _____ [state of confirming financial institution].

6. If this confirmation expires during an interruption of business of this financial institution as described in Article 17 of the UCP, we specifically agree to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

[Confirming financial institution]

(g) The following format shall be used by the Contracting Officer for a sight draft to draw on the Letter of Credit:

SIGHT DRAFT

[City, State]

(Date)_____

[Name and address of financial institution]

Pay to the order of----------

[Beneficiary Agency] _____

the sum of United States $ _____

This draft is drawn under----------

Irrevocable Letter of Credit No.----------

[Beneficiary Agency]

By: _____

79. *FAR 52.228-15 PERFORMANCE AND PAYMENT BONDS (JULY 2000)

(a) *Definitions*. As used in this clause—

"Original contract price" means the award price of the contract; or, for requirements contracts, the price payable for the estimated total quantity; or, for indefinite-quantity contracts, the price payable for the specified minimum quantity. Original contract price does not include the price of any options, except those options exercised at the time of contract award.

(b) *Amount of required bonds*. Unless the resulting contract price is $100,000 or less, the successful offeror shall furnish performance and payment bonds to the Contracting Officer as follows:

(1) *Performance bonds (Standard Form 25).* The penal amount of performance bonds at the time of contract award shall be 100 percent of the original contract price.

(2) *Payment Bonds (Standard Form 25-A).* The penal amount of payment bonds at the time of contract award shall be 100 percent of the original contract price.

(3) *Additional bond protection*. (i) The Government may require additional performance and payment bond protection if the contract price is increased. The increase in protection generally will equal 100 percent of the increase in contract price.

(ii) The Government may secure the additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(c) *Furnishing executed bonds*. The Contractor shall furnish all executed bonds, including any necessary reinsurance agreements, to the Contracting Officer, within the time period specified in the Bid Guarantee provision

of the solicitation, or otherwise specified by the Contracting Officer, but in any event, before starting work.

(d) *Surety or other security for bonds*. The bonds shall be in the form of firm commitment, supported by corporate sureties whose names appear on the list contained in Treasury Department Circular 570, individual sureties, or by other acceptable security such as postal money order, certified check, cashier's check, irrevocable letter of credit, or, in accordance with Treasury Department regulations, certain bonds or notes of the United States. Treasury Circular 570 is published in the Federal Register or may be obtained from the:

U.S. Department of Treasury
Financial Management Service
Surety Bond Branch
401 14th Street, NW, 2nd Floor, West Wing
Washington, DC 20227.

(e) *Notice of subcontractor waiver of protection (40 U.S.C. 270b(c).* Any waiver of the right to sue on the payment bond is void unless it is in writing, signed by the person whose right is waived, and executed after such person has first furnished labor or material for use in the performance of the contract.
(End of clause)

80. FAR 52.229-3 FEDERAL, STATE, AND LOCAL TAXES (APR 2003) [<u>For Contracts Exceeding $100,000</u>]

(a) As used in this clause--

"All applicable Federal, State, and local taxes and duties," means all taxes and duties, in effect on the contract date, that the taxing authority is imposing and collecting on the transactions or property covered by this contract.

"After-imposed Federal tax," means any new or increased Federal excise tax or duty, or tax that was exempted or excluded on the contract date but whose exemption was later revoked or reduced during the contract period, on the transactions or property covered by this contract that the Contractor is required to pay or bear as the result of legislative, judicial, or administrative action taking effect after the contract date. It does not include social security tax or other employment taxes.

"After-relieved Federal tax," means any amount of Federal excise tax or duty, except social security or other employment taxes, that would otherwise have been payable on the transactions or property covered by this contract, but which the Contractor is not required to pay or bear, or for which the Contractor obtains a refund or drawback, as the result of legislative, judicial, or administrative action taking effect after the contract date.

"Contract date," means the date set for bid opening or, if this is a negotiated contract or a modification, the effective date of this contract or modification.

"*Local taxes"* includes taxes imposed by a possession or territory of the United States, Puerto Rico, or the Northern Mariana Islands, if the contract is performed wholly or partly in any of those areas.

(b) The contract price includes all applicable Federal, State, and local taxes and duties.

(c) The contract price shall be increased by the amount of any after-imposed Federal tax, provided the Contractor warrants in writing that no amount for such newly imposed Federal excise tax or duty or rate increase was included in the contract price, as a contingency reserve or otherwise.

(d) The contract price shall be decreased by the amount of any after-relieved Federal tax.

(e) The contract price shall be decreased by the amount of any Federal excise tax or duty, except social security or other employment taxes, that the Contractor is required to pay or bear, or does not obtain a refund of, through the Contractor's fault, negligence, or failure to follow instructions of the Contracting Officer.

(f) No adjustment shall be made in the contract price under this clause unless the amount of the adjustment exceeds $250.

(g) The Contractor shall promptly notify the Contracting Officer of all matters relating to any Federal excise tax or duty that reasonably may be expected to result in either an increase or decrease in the contract price and shall take appropriate action as the Contracting Officer directs.

(h) The Government shall, without liability, furnish evidence appropriate to establish exemption from any Federal, State, or local tax when the Contractor requests such evidence and a reasonable basis exists to sustain the exemption.

81. RESERVED

82. FAR 52.230-1 COST ACCOUNTING STANDARDS NOTICES AND CERTIFICATION (JUNE 2000)

Note: This notice does not apply to small businesses or foreign governments. This notice is in three parts, identified by Roman numerals I through III.

Offerors shall examine each part and provide the requested information in order to determine Cost Accounting Standards (CAS) requirements applicable to any resultant contract.

If the offeror is an educational institution, Part II does not apply unless the contemplated contract will be subject to full or modified CAS coverage pursuant to 48 CFR 9903.201-2(c)(5) or 9903.201-2(c)(6), respectively.

I. DISCLOSURE STATEMENT--COST ACCOUNTING PRACTICES AND CERTIFICATION

(a) Any contract in excess of $500,000 resulting from this solicitation will be subject to the requirements of the Cost Accounting Standards Board (48 CFR Chapter 99), except for those contracts which are exempt as specified in 48 CFR 9903.201-1.

(b) Any offeror submitting a proposal which, if accepted, will result in a contract subject to the requirements of 48 CFR Chapter 99 must, as a condition of contracting, submit a Disclosure Statement as required by 48 CFR 9903.202. When required, the Disclosure Statement must be submitted as a part of the offeror's proposal under this solicitation unless the offeror has already submitted a Disclosure Statement disclosing the practices used in connection with the pricing of this proposal. If an applicable Disclosure Statement has already been submitted, the offeror may satisfy the requirement for submission by providing the information requested in paragraph (c) of Part I of this provision.

CAUTION: In the absence of specific regulations or agreement, a practice disclosed in a Disclosure Statement shall not, by virtue of such disclosure, be deemed to be a proper, approved, or agreed-to practice for pricing proposals or accumulating and reporting contract performance cost data.

(c) Check the appropriate box below:

[ ] (1) Certificate of Concurrent Submission of Disclosure Statement

The offeror hereby certifies that, as a part of the offer, copies of the Disclosure Statement have been submitted as follows: (i) original and one copy to the cognizant Administrative Contracting Officer (ACO) or cognizant Federal agency official authorized to act in that capacity (Federal official), as applicable, and (ii) one copy to the cognizant Federal auditor.

(Disclosure must be on Form No. CASB DS-1 or CASB DS-2, as applicable. Forms may be obtained from the cognizant ACO or Federal official and/or from the loose-leaf version of the Federal Acquisition Regulation.)

Date of Disclosure Statement: _____

Name and Address of Cognizant ACO or Federal Official Where Filed:

_____

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the Disclosure Statement.

[ ] (2) Certificate of Previously Submitted Disclosure Statement.

The offeror hereby certifies that the required Disclosure Statement was filed as follows:

Date of Disclosure Statement: _____
Name and Address of Cognizant ACO or Federal Official Where Filed:
_____

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the applicable Disclosure Statement.

[ ] (3) Certificate of Monetary Exemption.

The offeror hereby certifies that the offeror, together with all divisions, subsidiaries, and affiliates under common control, did not receive net awards of negotiated prime contracts and subcontracts subject to CAS totaling $50 million or more in the cost accounting period immediately preceding the period in which this proposal was submitted. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

[ ] (4) Certificate of Interim Exemption.

The offeror hereby certifies that (i) the offeror first exceeded the monetary exemption for disclosure, as defined in (3) of this subsection, in the cost accounting period immediately preceding the period in which this offer was submitted and (ii) in accordance with 48 CFR 9903.202-1, the offeror is not yet required to submit a Disclosure Statement. The offeror further certifies that if an award resulting from this proposal has not been made within 90 days after the end of that period, the offeror will immediately submit a revised certificate to the Contracting Officer, in the form specified under subparagraph (c)(1) or (c)(2) of Part I of this provision, as appropriate, to verify submission of a completed Disclosure Statement.

CAUTION: Offerors currently required to disclose because they were awarded a CAS-covered prime contract or subcontract of $50 million or more in the current cost accounting period may not claim this exemption (4). Further, the exemption applies only in connection with proposals submitted before expiration of the 90-day period following the cost accounting period in which the monetary exemption was exceeded.

II. COST ACCOUNTING STANDARDS--ELIGIBILITY FOR MODIFIED CONTRACT COVERAGE

If the offeror is eligible to use the modified provisions of 48 CFR 9903.201-2(b) and elects to do so, the offeror shall indicate by checking the box below. Checking the box below shall mean that the resultant contract is subject to the Disclosure and Consistency of Cost Accounting Practices clause in lieu of the Cost Accounting Standards clause.

[ ] The offeror hereby claims an exemption from the Cost Accounting Standards clause under the provisions of 48 CFR 9903.201-2(b) and certifies that the offeror is eligible for use of the Disclosure and Consistency of Cost Accounting Practices clause because during the cost accounting period immediately preceding the period in which this proposal was submitted, the offeror received less than $50 million in awards of CAS-covered prime contracts and subcontracts. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

CAUTION: An offeror may not claim the above eligibility for modified contract coverage if this proposal is expected to result in the award of a CAS-covered contract of $50 million or more or if, during its current cost accounting period, the offeror has been awarded a single CAS-covered prime contract or subcontract of $50 million or more.

III. ADDITIONAL COST ACCOUNTING STANDARDS APPLICABLE TO EXISTING CONTRACTS

The offeror shall indicate below whether award of the contemplated contract would, in accordance with subparagraph (a)(3) of the Cost Accounting Standards clause, require a change in established cost accounting practices affecting existing contracts and subcontracts.

[ ] YES [ ] NO
(End of provision)

83. *FAR 52.230-2 COST ACCOUNTING STANDARDS (APR 1998)

(a) Unless the contract is exempt under 48 CFR 9903.201-1 and 9903.201-2, the provisions of 48 CFR Part 9903 are incorporated herein by reference and the Contractor, in connection with this contract, shall--

(1) (CAS-covered Contracts Only) By submission of a Disclosure Statement, disclose in writing the Contractor's cost accounting practices as required by 48 CFR 9903.202-1 through 9903.202-5, including methods of distinguishing direct costs from indirect costs and the basis used for allocating indirect costs. The practices disclosed for this contract shall be the same as the practices currently disclosed and applied on all other contracts and subcontracts being performed by the Contractor and which contain a Cost Accounting Standards (CAS) clause. If the Contractor has notified the Contracting Officer that the Disclosure Statement contains trade secrets and commercial or financial information which is privileged and confidential, the Disclosure Statement shall be protected and shall not be released outside of the Government.

(2) Follow consistently the Contractor's cost accounting practices in accumulating and reporting contract performance cost data concerning this contract. If any change in cost accounting practices is made for the purposes of any contract or subcontract subject to CAS requirements, the change must be applied prospectively to this contract and the Disclosure Statement must be amended accordingly. If the contract price or cost allowance of this contract is affected by such changes, adjustment shall be made in accordance with subparagraph (a)(4) or (a)(5) of this clause, as appropriate.

(3) Comply with all CAS, including any modifications and interpretations indicated thereto contained in 48 CFR Part 9904, in effect on the date of award of this contract or, if the Contractor has submitted cost or pricing data, on the date of final agreement on price as shown on the Contractor's signed certificate of current cost or pricing data. The Contractor shall also comply with any CAS (or modifications to CAS) which hereafter become applicable to a contract or subcontract of the Contractor. Such compliance shall be required prospectively from the date of applicability to such contract or subcontract.

(4)(i) Agree to an equitable adjustment as provided in the Changes clause of this contract if the contract cost is affected by a change which, pursuant to subparagraph (a)(3) of this clause, the Contractor is required to make to the Contractor's established cost accounting practices.

(ii) Negotiate with the Contracting Officer to determine the terms and conditions under which a change may be made to a cost accounting practice, other than a change made under other provisions of subparagraph (a)(4) of this clause; provided that no agreement may be made under this provision that will increase costs paid by the United States.

(iii) When the parties agree to a change to a cost accounting practice, other than a change under subdivision (a)(4)(i) of this clause, negotiate an equitable adjustment as provided in the Changes clause of this contract.

(5) Agree to an adjustment of the contract price or cost allowance, as appropriate, if the Contractor or a subcontractor fails to comply with an applicable Cost Accounting Standard, or to follow any cost accounting practice consistently and such failure results in any increased costs paid by the United States. Such adjustment shall provide for recovery of the increased costs to the United States, together with interest thereon computed at the annual rate established under section 6621 of the Internal Revenue Code of 1986 (26 U.S.C. 6621) for such period, from the time the payment by the United States was made to the time the adjustment is effected. In no case shall the Government recover costs greater than the increased cost to the Government, in the aggregate, on the relevant contracts subject to the price adjustment, unless the Contractor made a change in its cost accounting practices of which it was aware or should have been aware at the time of price negotiations and which it failed to disclose to the Government.

(b) If the parties fail to agree whether the Contractor or a subcontractor has complied with an applicable CAS in 48 CFR 9904 or a CAS rule or regulation in 48 CFR 9903 and as to any cost adjustment demanded by the United States, such failure to agree will constitute a dispute under the Contract Disputes Act (41 U.S.C. 601).

(c) The Contractor shall permit any authorized representatives of the Government to examine and make copies of any documents, papers, or records relating to compliance with the requirements of this clause.

(d) The Contractor shall include in all negotiated subcontracts which the Contractor enters into, the substance of this clause, except paragraph (b), and shall require such inclusion in all other subcontracts, of any tier, including the obligation to comply with all CAS in effect on the subcontractor's award date or if the subcontractor has submitted cost or pricing data, on the date of final agreement on price as shown on the subcontractor's signed Certificate of Current Cost or Pricing Data. If the subcontract is awarded to a business unit which pursuant to 48 CFR 9903.201-2 is subject to other types of CAS coverage, the substance of the applicable clause set forth in subsection 30.201-4 of the Federal Acquisition Regulation shall be inserted. This requirement shall apply only to negotiated subcontracts in excess of $500,000, except that the requirement shall not apply to negotiated subcontracts otherwise exempt from the requirement to include a CAS clause as specified in 48 CFR 9903.201-1.

(End of clause)

84. *FAR 52.230-3 DISCLOSURE AND CONSISTENCY OF COST ACCOUNTING PRACTICES (APR 1998)

(a) The Contractor, in connection with this contract, shall--

(1) Comply with the requirements of 48 CFR 9904.401, Consistency in Estimating, Accumulating, and Reporting Costs; 48 CFR 9904.402, Consistency in Allocating Costs Incurred for the Same Purpose; 48 CFR 9904.405, Accounting for Unallowable Costs; and 48 CFR 9904.406, Cost Accounting Standard--Cost Accounting Period, in effect on the date of award of this contract as indicated in 48 CFR Part 9904.

(2) (CAS-covered Contracts Only) If it is a business unit of a company required to submit a Disclosure Statement, disclose in writing its cost accounting practices as required by 48 CFR 9903.202-1 through 9903.202-5. If the Contractor has notified the Contracting Officer that the Disclosure Statement contains trade secrets and commercial or financial information which is privileged and confidential, the Disclosure Statement shall be protected and shall not be released outside of the Government.

(3)(i) Follow consistently the Contractor's cost accounting practices. A change to such practices may be proposed, however, by either the Government or the Contractor, and the Contractor agrees to negotiate with the Contracting Officer the terms and conditions under which a change may be made. After the terms and conditions under which the change is to be made have been agreed to, the change must be applied prospectively to this contract, and the Disclosure Statement, if affected, must be amended accordingly.

(ii) The Contractor shall, when the parties agree to a change to a cost accounting practice and the Contracting Officer has made the finding required in 48 CFR 9903.201-6(b), that the change is desirable and not detrimental to the interests of the Government, negotiate an equitable adjustment as provided in the Changes clause of this contract. In the absence of the required finding, no agreement may be made under this contract clause that will increase costs paid by the United States.

(4) Agree to an adjustment of the contract price or cost allowance, as appropriate, if the Contractor or a subcontractor fails to comply with the applicable CAS or to follow any cost accounting practice, and such failure results in any increased costs paid by the United States. Such adjustment shall provide for recovery of the increased costs to the United States together with interest thereon computed at the annual rate of interest established under the Internal Revenue Code of 1986 (26 U.S.C. 6621), from the time the payment by the United States was made to the time the adjustment is effected.

(b) If the parties fail to agree whether the Contractor has complied with an applicable CAS, rule, or regulation as specified in 48 CFR 9903 and 9904 and as to any cost adjustment demanded by the United States, such failure to agree will constitute a dispute under the Contract Disputes Act (41 U.S.C. 601).

(c) The Contractor shall permit any authorized representatives of the Government to examine and make copies of any documents, papers, and records relating to compliance with the requirements of this clause.

(d) The Contractor shall include in all negotiated subcontracts, which the Contractor enters into, the substance of this clause, except paragraph (b), and shall require such inclusion in all other subcontracts of any tier, except that--

(1) If the subcontract is awarded to a business unit which pursuant to 48 CFR 9903.201-2 is subject to other types of CAS coverage, the substance of the applicable clause set forth in subsection 30.201-4 of the Federal Acquisition Regulation shall be inserted.

(2) This requirement shall apply only to negotiated subcontracts in excess of $500,000.

(3) The requirement shall not apply to negotiated subcontracts otherwise exempt from the requirement to include a CAS clause as specified in 48 CFR 9903.201-1.

(End of clause)

85. DFARS 252.231-7000 SUPPLEMENTAL COST PRINCIPLES (DEC 1991)

When the allowability of costs under this contract is determined in accordance with part 31 of the Federal Acquisition Regulation (FAR) allowability shall also be determined in accordance with part 231 of the DoD FAR Supplement, in effect on the date of this contract.

86. *FAR 52.232-5 PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (SEPT 2002)

(a) Payment of Price. The Government shall pay the Contractor the contract price as provided in this contract.

(b) Progress Payments. The Government shall make progress payments monthly as the work proceeds, or at more frequent intervals as determined by the Contracting Officer, on estimates of work accomplished which meets the standards of quality established under the contract, as approved by the Contracting Officer.

(1) The Contractor's request for progress payments shall include the following substantiation:

(i) An itemization of the amounts requested, related to the various elements of work required by the contract covered by the payment requested.

(ii) A listing of the amount included for work performed by each subcontractor under the contract.

(iii) A listing of the total amount of each subcontract under the contract.

(iv) A listing of the amounts previously paid to each such subcontractor under the contract.

(v) Additional supporting data in a form and detail required by the Contracting Officer.

(2) In the preparation of estimates, the Contracting Officer may authorize material delivered on the site and preparatory work done to be taken into consideration. Material delivered to the Contractor at locations other than the site also may be taken into consideration if--

(i) Consideration is specifically authorized by this contract; and

(ii) The Contractor furnishes satisfactory evidence that it has acquired title to such material and that the material will be used to perform this contract.

(c) Contractor Certification. Along with each request for progress payments, the Contractor shall furnish the following certification, or payment shall not be made: (However, if the Contractor elects to delete paragraph (c)(4) from the certification, the certification is still acceptable.) I hereby certify, to the best of my knowledge and belief, that--

(1) The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;

(2) All payments due to subcontractors and suppliers from previous payments received under the contract have been made, and timely payments will be made from the proceeds of the payment covered by this

certification, in accordance with subcontract agreements and the requirements of chapter 39 of Title 31, United States Code;

(3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract; and

(4) This certification is not to be construed as final acceptance of a subcontractor's performance.

(Name)

(Title)

(Date)

(d) Refund of Unearned Amounts. If the Contractor, after making a certified request for progress payments, discovers that a portion or all of such request constitutes a payment for performance by the Contractor that fails to conform to the specifications, terms, and conditions of this contract (hereinafter referred to as the "unearned amount"), the Contractor shall--

(1) Notify the Contracting Officer of such performance deficiency; and

(2) Be obligated to pay the Government an amount (computed by the Contracting Officer in the manner provided in paragraph (j) of this clause) equal to interest on the unearned amount from the 8th day after the date of receipt of the unearned amount until--

(i) The date the Contractor notifies the Contracting Officer that the performance deficiency has been corrected; or

(ii) The date the Contractor reduces the amount of any subsequent certified request for progress payments by an amount equal to the unearned amount.

(e) Retainage. If the Contracting Officer finds that satisfactory progress was achieved during any period for which a progress payment is to be made, the Contracting Officer shall authorize payment to be made in full. However, if satisfactory progress has not been made, the Contracting Officer may retain a maximum of 10 percent of the amount of the payment until satisfactory progress is achieved. When the work is substantially complete, the Contracting Officer may retain from previously withheld funds and future progress payments that amount the Contracting Officer considers adequate for protection of the Government and shall release to the Contractor all the remaining withheld funds. Also, on completion and acceptance of each separate building, public work, or other division of the contract, for which the price is stated separately in the contract, payment shall be made for the completed work without retention of a percentage.

(f) Title, Liability, and Reservation of Rights. All material and work covered by progress payments made shall, at the time of payment, become the sole property of the Government, but this shall not be construed as--

(1) Relieving the Contractor from the sole responsibility for al material and work upon which payments have been made or the restoration of any damaged work; or

(2) Waiving the right of the Government to require the fulfillment of all of the terms of the contract.

(g) Reimbursement for Bond Premiums. In making these progress payments, the Government shall, upon request, reimburse the Contractor for the amount of premiums paid for performance and payment bonds (including coinsurance and reinsurance agreements, when applicable) after the Contractor has furnished evidence of full payment to the surety. The retainage provisions in paragraph (e) of this clause shall not apply to that portion of progress payments attributable to bond premiums.

(h) Final Payment. The Government shall pay the amount due the Contractor under this contract after--

(1) Completion and acceptance of all work;

(2) Presentation of a properly executed voucher; and

(3) Presentation of release of all claims against the Government arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned under the Assignment of Claims Act of 1940 (31 U.S.C. 3727 and 41 U.S.C. 15).

(i) Limitation Because of Undefinitized Work. Notwithstanding any provision of this contract, progress payments shall not exceed 80 percent on work accomplished on undefinitized contract actions. A "contract action" is any action resulting in a contract, as defined in FAR Subpart 2.1, including contract modifications for additional supplies or services, but not including contract modifications that are within the scope and under the terms of the contract, such as contract modifications issued pursuant to the Changes clause, or funding and other administrative changes.

(j) Interest Computation on Unearned Amounts. In accordance with 31 U.S.C. 3903(c)(1), the amount payable under subparagraph (d)(2) of this clause shall be--

(1) Computed at the rate of average bond equivalent rates of 91-day Treasury bills auctioned at the most recent auction of such bills prior to the date the Contractor receives the unearned amount; and

(2) Deducted from the next available payment to the Contractor.

87. RESERVED.

88. RESERVED.

89. *FAR 52.232-17 INTEREST (JUN 1996)

(a) Except as otherwise provided in this contract under a Price Reduction for Defective Cost or Pricing Data clause or a Cost Accounting Standards clause, all amounts that become payable by the Contractor to the Government under this contract (net of any applicable tax credit under the Internal Revenue Code (26 U.S.C. 1481)) shall bear simple interest from the date due until paid unless paid within 30 days of becoming due. The interest rate shall be the interest rate established by the Secretary of the Treasury as provided in Section 12 of the Contract Disputes Act of 1978 (Public Law 95-563), which is applicable to the period in which the amount becomes due, as provided in paragraph (b) of this clause, and then at the rate applicable for each six-month period as fixed by the Secretary until the amount is paid.

(b) Amounts shall be due at the earliest of the following dates:

(1) The date fixed under this contract.

(2) The date of the first written demand for payment consistent with this contract, including any demand resulting from a default termination.

(3) The date the Government transmits to the Contractor a proposed supplemental agreement to confirm completed negotiations establishing the amount of debt.

(4) If this contract provides for revision of prices, the date of written notice to the Contractor stating the amount of refund payable in connection with a pricing proposal or a negotiated pricing agreement not confirmed by contract modification.

(c) The interest charge made under this clause may be reduced under the procedures prescribed in 32.614-2 of the Federal Acquisition Regulation in effect on the date of this contract.

90. *FAR 52.232-23 ASSIGNMENT OF CLAIMS (JAN 1986)

(a) The Contractor, under the Assignment of Claims Act, as amended, 31 U.S.C. 3727, 41 U.S.C. 15 (hereafter referred to as "the Act"), may assign its rights to be paid amounts due or to become due as a result of the performance of this contract to a bank, trust company, or other financing institution, including any Federal lending agency. The assignee under such an assignment may thereafter further assign or reassign its right under the original assignment to any type of financing institution described in the preceding sentence.

(b) Any assignment or reassignment authorized under the Act and this clause shall cover all unpaid amounts payable under this contract, and shall not be made to more than one party, except that an assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in the financing of this contract.

(c) The Contractor shall not furnish or disclose to any assignee under this contract any classified document (including this contract) or information related to work under this contract until the Contracting Officer authorizes such action in writing.

91. RESERVED.

92. *FAR 52.232-27 PROMPT PAY FOR CONSTRUCTION CONTRACTS (OCT 2003)

Notwithstanding any other payment terms in this contract, the Government will make invoice payments under the terms and conditions specified in this clause. The Government considers payment as being made on the day a check is dated or the date of an electronic funds transfer. Definitions of pertinent terms are set forth in sections 2.101, 32.001, and 32.902 of the Federal Acquisition Regulation. All days referred to in this clause are calendar days, unless otherwise specified. (However, see paragraph (a)(3) concerning payments due on Saturdays, Sundays, and legal holidays.)

(a) *Invoice payments*—(1) *Types of invoice payments.* For purposes of this clause, there are several types of invoice payments that may occur under this contract, as follows:

(i) Progress payments, if provided for elsewhere in this contract, based on Contracting Officer approval of the estimated amount and value of work or services performed, including payments for reaching milestones in any project.

(A) The due date for making such payments is 14 days after the designated billing office receives a proper payment request. If the designated billing office fails to annotate the payment request with the actual date of receipt at the time of receipt, the payment due date is the 14th day after the date of the Contractor's payment request, provided the designated billing office receives a proper payment request and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(B) The due date for payment of any amounts retained by the Contracting Officer in accordance with the clause at 52.232–5, Payments Under Fixed-Price Construction Contracts, is as specified in the contract or, if not specified, 30 days after approval by the Contracting Officer for release to the Contractor.

(ii) Final payments based on completion and acceptance of all work and presentation of release of all claims against the Government arising by virtue of the contract, and payments for partial deliveries that have been accepted by the Government (*e.g.,* each separate building, public work, or other division of the contract for which the price is stated separately in the contract).

(A) The due date for making such payments is the later of the following two events:

(*1*) The 30th day after the designated billing office receives a proper invoice from the Contractor.

(*2*) The 30th day after Government acceptance of the work or services completed by the Contractor. For a final invoice when the payment amount is subject to contract settlement actions (*e.g.,* release of claims), acceptance is deemed to occur on the effective date of the contract settlement.

(B) If the designated billing office fails to annotate the invoice with the date of actual receipt at the time of receipt, the invoice payment due date is the 30th day after the date of the Contractor's invoice, provided the designated billing office receives a proper invoice and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(2) *Contractor's invoice.* The Contractor shall prepare and submit invoices to the designated billing office specified in the contract. A proper invoice must include the items listed in paragraphs (a)(2)(i) through (a)(2)(xi) of this clause. If the invoice does not comply with these requirements, the designated billing office must return it within 7 days after receipt, with the reasons why it is not a proper invoice. When computing any interest penalty owed the Contractor, the Government will take into account if the Government notifies the Contractor of an improper invoice in an untimely manner.

(i) Name and address of the Contractor.

(ii) Invoice date and invoice number. (The Contractor should date invoices as close as possible to the date of mailing or transmission.)

(iii) Contract number or other authorization for work or services performed (including order number and contract line item number).

(iv) Description of work or services performed.

(v) Delivery and payment terms (*e.g.,* discount for prompt payment terms).

(vi) Name and address of Contractor official to whom payment is to be sent (must be the same as that in the contract or in a proper notice of assignment).

(vii) Name (where practicable), title, phone number, and mailing address of person to notify in the event of a defective invoice.

(viii) For payments described in paragraph (a)(1)(i) of this clause, substantiation of the amounts requested and certification in accordance with the requirements of the clause at 52.232–5, Payments Under Fixed-Price Construction Contracts.

(ix) Taxpayer Identification Number (TIN). The Contractor shall include its TIN on the invoice only if required elsewhere in this contract.

(x) Electronic funds transfer (EFT) banking information.

(A) The Contractor shall include EFTbanking information on the invoice only if required elsewhere in this contract.

(B) If EFT banking information is not required to be on the invoice, in order for the invoice to be a proper invoice, the Contractor shall have submitted correct EFT banking information in accordance with the applicable solicitation provision (*e.g.,* 52.232–38, Submission of Electronic Funds Transfer Information with Offer), contract clause (*e.g.,* 52.232–33, Payment by Electronic Funds Transfer—Central Contractor Registration, or 52.232–34, Payment by Electronic Funds Transfer—Other Than Central Contractor Registration), or applicable agency procedures.

(C) EFT banking information is not required if the Government waived the requirement to pay by EFT.

(xi) Any other information or documentation required by the contract.

(3) *Interest penalty.* The designated payment office will pay an interest penalty automatically, without request from the Contractor, if payment is not made by the due date and the conditions listed in paragraphs (a)(3)(i) through (a)(3)(iii) of this clause are met, if applicable. However, when the due date falls on a Saturday, Sunday, or legal holiday, the designated payment office may make payment on the following working day without incurring a late payment interest penalty.

(i) The designated billing office received a proper invoice.

(ii) The Government processed a receiving report or other Government documentation authorizing payment and there was no disagreement over quantity, quality, Contractor compliance with any contract term or condition, or requested progress payment amount.

(iii) In the case of a final invoice for any balance of funds due the Contractor for work or services performed, the amount was not subject to further contract settlement actions between the Government and the Contractor.

(4) *Computing penalty amount.* The Government will compute the interest penalty in accordance with the Office of Management and Budget prompt payment regulations at 5 CFR part 1315.

(i) For the sole purpose of computing an interest penalty that might be due the Contractor for payments described in paragraph (a)(1)(ii) of this clause, Government acceptance or approval is deemed to occur constructively on the 7th day after the Contractor has completed the work or services in accordance with the terms and conditions of the contract. If actual acceptance or approval occurs within the constructive acceptance or approval period, the Government will base the determination of an interest penalty on the actual date of acceptance or approval. Constructive acceptance or constructive approval requirements do not apply if there is a disagreement over quantity, quality, or Contractor compliance with a contract provision. These requirements also do not compel Government officials to accept work or services, approve Contractor estimates, perform contract administration functions, or make payment prior to fulfilling their responsibilities.

(ii) The prompt payment regulations at 5 CFR 1315.10(c) do not require the Government to pay interest penalties if payment delays are due to disagreement between the Government and the Contractor over the payment amount or other issues involving contract compliance, or on amounts temporarily withheld or retained in accordance with the terms of the contract. The Government and the Contractor shall resolve

claims involving disputes, and any interest that may be payable in accordance with the clause at FAR 52.233–1, Disputes.

(5) *Discounts for prompt payment.* The designated payment office will pay an interest penalty automatically, without request from the Contractor, if the Government takes a discount for prompt payment improperly. The Government will calculate the interest penalty in accordance with the prompt payment regulations at 5 CFR part 1315.

(6) *Additional interest penalty.* (i) The designated payment office will pay a penalty amount, calculated in accordance with the prompt payment regulations at 5 CFR part 1315 in addition to the interest penalty amount only if—

(A) The Government owes an interest penalty of $1 or more;

(B) The designated payment office does not pay the interest penalty within 10 days after the date the invoice amount is paid; and

(C) The Contractor makes a written demand to the designated payment office for additional penalty payment, in accordance with paragraph (a)(6)(ii) of this clause, postmarked not later than 40 days after the date the invoice amount is paid.

(ii)(A) The Contractor shall support written demands for additional penalty payments with the following data. The Government will not request any additional data. The Contractor shall—

(*1*) Specifically assert that late payment interest is due under a specific invoice, and request payment of all overdue late payment interest penalty and such additional penalty as may be required;

(*2*) Attach a copy of the invoice on which the unpaid late payment interest was due; and

(*3*) State that payment of the principal has been received, including the date of receipt.

(B) If there is no postmark or the postmark is illegible—

(1) The designated payment office that receives the demand will annotate it with the date of receipt provided the demand is received on or before the 40th day after payment was made; or

(*2*) If the designated payment office fails to make the required annotation, the Government will determine the demand's validity based on the date the Contractor has placed on the demand, provided such date is no later than the 40th day after payment was made.

(b) *Contract financing payments.* If this contract provides for contract financing, the Government will make contract financing payments in accordance with the applicable contract financing clause.

(c) *Subcontract clause requirements.* The Contractor shall include in each subcontract for property or services (including a material supplier) for the purpose of performing this contract the following:

(1) *Prompt payment for subcontractors.* A payment clause that obligates the Contractor to pay the subcontractor for satisfactory performance under its subcontract not later than 7 days from receipt of payment out of such amounts as are paid to the Contractor under this contract.

(2) *Interest for subcontractors.* An interest penalty clause that obligates the Contractor to pay to the subcontractor an interest penalty for each payment not made in accordance with the payment clause—

(i) For the period beginning on the day after the required payment date and ending on the date on which payment of the amount due is made; and

(ii) Computed at the rate of interest established by the Secretary of the Treasury, and published in the **Federal Register,** for interest payments under section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty.

(3) *Subcontractor clause flowdown.* A clause requiring each subcontractor to

(i) Include a payment clause and an interest penalty clause conforming to the standards set forth in paragraphs (c)(1) and (c)(2) of this clause in each of its subcontracts; and

(ii) Require each of its subcontractors to include such clauses in their subcontracts with each lower-tier subcontractor or supplier.

(d) *Subcontract clause interpretation.* The clauses required by paragraph (c) of this clause shall not be construed to impair the right of the Contractor or a subcontractor at any tier to negotiate, and to include in their subcontract, provisions that—

(1) *Retainage permitted.* Permit the Contractor or a subcontractor to retain (without cause) a

specified percentage of each progress payment otherwise due to a subcontractor for satisfactory performance under the subcontract without incurring any obligation to pay a late payment interest penalty, in accordance with terms and conditions agreed to by the parties to the subcontract, giving such recognition as the parties deem appropriate to the ability of a subcontractor to furnish a performance bond and a payment bond;

(2) *Withholding permitted.* Permit the Contractor or subcontractor to make a determination that part or all of the subcontractor's request for payment may be withheld in accordance with the subcontract agreement; and

(3) *Withholding requirements.* Permit such withholding without incurring any obligation to pay a late payment penalty if—

(i) A notice conforming to the standards of paragraph (g) of this clause previously has been furnished to the subcontractor; and

(ii) The Contractor furnishes to the Contracting Officer a copy of any notice issued by a Contractor pursuant to paragraph (d)(3)(i) of this clause.

(e) *Subcontractor withholding procedures.* If a Contractor, after making a request for payment to the Government but before making a payment to a subcontractor for the subcontractor's performance covered by the payment request, discovers that all or a portion of the payment otherwise due such subcontractor is subject to withholding from the subcontractor in accordance with the subcontract agreement, then the Contractor shall—

(1) *Subcontractor notice.* Furnish to the subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon ascertaining the cause giving rise to a withholding, but prior to the due date for subcontractor payment;

(2) *Contracting Officer notice.* Furnish to the Contracting Officer, as soon as practicable, a copy of the notice furnished to the subcontractor pursuant to paragraph (e)(1) of this clause;

(3) *Subcontractor progress payment reduction.* Reduce the subcontractor's progress payment by an amount not to exceed the amount specified in the notice of withholding furnished under paragraph (e)(1) of this clause;

(4) *Subsequent subcontractor payment.* Pay the subcontractor as soon as practicable after the correction of the identified subcontract performance deficiency, and—

(i) Make such payment within—

(A) Seven days after correction of the identified subcontract performance deficiency (unless the funds therefor must be recovered from the Government because of a reduction under paragraph (e)(5)(i)) of this clause; or

(B) Seven days after the Contractor recovers such funds from the Government; or

(ii) Incur an obligation to pay a late payment interest penalty computed at the rate of interest established by the Secretary of the Treasury, and published in the **Federal Register**, for interest payments under section 12 of the Contracts Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty;

(5) *Notice to Contracting Officer.* Notify the Contracting Officer upon—

(i) Reduction of the amount of any subsequent certified application for payment; or

(ii) Payment to the subcontractor of any withheld amounts of a progress payment, specifying—

(A) The amounts withheld under paragraph (e)(1) of this clause; and

(B) The dates that such withholding began and ended; and

(6) *Interest to Government.* Be obligated to pay to the Government an amount equal to interest on the withheld payments (computed in the manner provided in 31 U.S.C. 3903(c)(1)), from the 8th day after receipt of the withheld amounts from the Government until—

(i) The day the identified subcontractor performance deficiency is corrected; or

(ii) The date that any subsequent payment is reduced under paragraph (e)(5)(i) of this clause.

(f) *Third-party deficiency reports*—(1) *Withholding from subcontractor.* If a Contractor, after making payment to a first-tier subcontractor, receives from a supplier or subcontractor of the first-tier subcontractor (hereafter referred to as a ''second-tier subcontractor'') a written notice in accordance with section 2 of the Act of August 24, 1935 (40 U.S.C. 270b, Miller Act), asserting a deficiency in such first-tier subcontractor's performance under the contract for which the Contractor may be ultimately liable, and the Contractor determines

that all or a portion of future payments otherwise due such first-tier subcontractor is subject to withholding in accordance with the subcontract agreement, the Contractor may, without incurring an obligation to pay an interest penalty under paragraph (e)(6) of this clause—

(i) Furnish to the first-tier subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon making such determination; and

(ii) Withhold from the first-tier subcontractor's next available progress payment or payments an amount not to exceed the amount specified in the notice of withholding furnished under paragraph (f)(1)(i) of this clause.

(2) *Subsequent payment or interest charge.* As soon as practicable, but not later than 7 days after receipt of satisfactory written notification that the identified subcontract performance deficiency has been corrected, the Contractor shall—

(i) Pay the amount withheld under paragraph (f)(1)(ii) of this clause to such first-tier subcontractor; or

(ii) Incur an obligation to pay a late payment interest penalty to such first-tier subcontractor computed at the rate of interest established by the Secretary of the Treasury, and published in the **Federal Register**, for interest payments under section 12 of the Contracts Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty.

(g) *Written notice of subcontractor withholding.* The Contractor shall issue a written notice of any withholding to a subcontractor (with a copy furnished to the Contracting Officer), specifying—

(1) The amount to be withheld;

(2) The specific causes for the withholding under the terms of the subcontract; and

(3) The remedial actions to be taken by the subcontractor in order to receive payment of the amounts withheld.

(h) *Subcontractor payment entitlement.* The Contractor may not request payment from the Government of any amount withheld or retained in accordance with paragraph (d) of this clause until such time as the Contractor has determined and certified to the Contracting Officer that the subcontractor is entitled to the payment of such amount.

(i) *Prime-subcontractor disputes.* A dispute between the Contractor and subcontractor relating to the amount or entitlement of a subcontractor to a payment or a late payment interest penalty under a clause included in the subcontract pursuant to paragraph (c) of this clause does not constitute a dispute to which the Government is a party. The Government may not be interpleaded in any judicial or administrative proceeding involving such a dispute.

(j) *Preservation of prime-subcontractor rights.* Except as provided in paragraph (i) of this clause, this clause shall not limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or a subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor or deficient subcontract performance or nonperformance by a subcontractor.

(k) *Non-recourse for prime contractor interest penalty.* The Contractor's obligation to pay an interest penalty to a subcontractor pursuant to the clauses included in a subcontract under paragraph (c) of this clause shall not be construed to be an obligation of the Government for such interest penalty. A cost-reimbursement claim may not include any amount for reimbursement of such interest penalty.

(l) *Overpayments*. If the Contractor becomes aware of a duplicate contract financing or invoice payment or that the Government has otherwise overpaid on a contract financing or invoice payment, the Contractor shall immediately notify the Contracting Officer and request instructions for disposition of the overpayment.
(End of clause)

93. *FAR 52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER –CENTRAL CONTRACTOR REGISTRATION (OCT 2003)

(a) *Method of payment*. (1) All payments by the Government under this contract shall be made by electronic funds transfer (EFT), except as provided in paragraph (a)(2) of this clause. As used in this clause, the term ''EFT'' refers to the funds transfer and may also include the payment information transfer.

(2) In the event the Government is unable to release one or more payments by EFT, the Contractor agrees to either—

(i) Accept payment by check or some other mutually agreeable method of payment; or

(ii) Request the Government to extend the payment due date until such time as the Government can make payment by EFT (but see paragraph (d) of this clause).

(b) *Contractor's EFT information*. The Government shall make payment to the Contractor using the EFT information contained in the Central Contractor Registration (CCR) database. In the event that the EFT information changes, the Contractor shall be responsible for providing the updated information to the CCR database.

(c) *Mechanisms for EFT payment*. The Government may make payment by EFT through either the Automated Clearing House (ACH) network, subject to the rules of the National Automated Clearing House Association, or the Fedwire Transfer System. The rules governing Federal payments through the ACH are contained in 31 CFR part 210.

(d) *Suspension of payment*. If the Contractor's EFT information in the CCR database is incorrect, then the Government need not make payment to the Contractor under this contract until correct EFT information is entered into the CCR database; and any invoice or contract financing request shall be deemed not to be a proper invoice for the purpose of prompt payment under this contract. The prompt payment terms of the contract regarding notice of an improper invoice and delays in accrual of interest penalties apply.

(e) *Contractor EFT arrangements*. If the Contractor has identified multiple payment receiving points (i.e., more than one remittance address and/or EFT information set) in the CCR database, and the Contractor has not notified the Government of the payment receiving point applicable to this contract, the Government shall make payment to the first payment receiving point (EFT information set or remittance address as applicable) listed in the CCR database.

(f) *Liability for uncompleted or erroneous transfers*. (1) If an uncompleted or erroneous transfer occurs because the Government used
the Contractor's EFT information incorrectly, the Government remains responsible for—

(i) Making a correct payment;

(ii) Paying any prompt payment penalty due; and

(iii) Recovering any erroneously directed funds.

(2) If an uncompleted or erroneous transfer occurs because the Contractor's EFT information was incorrect, or was revised within 30 days of Government release of the EFT payment transaction instruction to the Federal Reserve System, and—

(i) If the funds are no longer under the control of the payment office, the Government is deemed to have made payment and the Contractor is responsible for recovery of any erroneously directed funds; or

(ii) If the funds remain under the control of the payment office, the Government shall not make payment, and the provisions of paragraph (d) of this clause shall apply.

(g) *EFT and assignment of claims*. If the Contractor assigns the proceeds of this contract as provided for in the assignment of claims terms of this contract, the Contractor shall require as a condition of any such assignment, that the assignee shall register separately in the CCR database and shall be paid by EFT in accordance with the terms of this clause. Notwithstanding any other requirement of this contract, payment to an ultimate recipient other than the Contractor, or a financial institution properly recognized under an assignment of claims pursuant to Subpart 32.8, is not permitted. In all respects, the requirements of this clause shall apply to the assignee as if it were the Contractor. EFT information that shows the ultimate recipient of the transfer to be other than the Contractor, in the absence of a proper assignment of claims acceptable to the Government, is incorrect EFT information within the meaning of paragraph
(d) of this clause.

(h) *Liability for change of EFT information by financial agent.* The Government is not liable for errors resulting from changes to EFT information made by the Contractor's financial agent.

(i) *Payment information*. The payment or disbursing office shall forward to the Contractor available payment information that is suitable for transmission as of the date of release of the EFT instruction to the Federal Reserve System. The Government may request the Contractor to designate a desired format and method(s) for delivery of payment information from a list of formats and methods the payment office is capable of executing. However, the Government does not guarantee that any particular format or method of delivery is available at any particular payment office and retains the latitude to use the format and delivery method most convenient to the Government. If the Government makes payment by check in accordance with paragraph (a) of this clause, the Government shall mail the payment information to the remittance address contained in the CCR database.

(End of Clause)

94. DFARS 252.232-7004 DOD PROGRESS PAYMENT RATES (OCT 2001)

(a) If the contractor is a small business concern, the Progress Payments clause of this contract is modified to change each mention of the progress payment rate and liquidation rate (excepting paragraph (k), *Limitations on Undefinitized Contract Actions*) to 90 percent.

(b) If the contractor is a small disadvantaged business concern, the Progress Payments clause of this contract is modified to change each mention of the progress payment rate and liquidation rate (excepting paragraph (k), *Limitations on Undefinitized Contract Actions*) to 95 percent.

(End of clause)

95. DFARS 252.232-7005 REIMBURSEMENT OF SUBCONTRACTOR ADVANCE PAYMENTS--DOD PILOT MENTOR-PROTEGE PROGRAM (SEP 2001)

(a) The Government will reimburse the Contractor for any advance payments made by the Contractor, as a mentor firm, to a protege firm, pursuant to an approved mentor-protege agreement, provided-

(1) The Contractor's subcontract with the protege firm includes a provision substantially the same as FAR 52.232-12, Advance Payments;

(2) The Contractor has administered the advance payments in accordance with the policies of FAR Subpart 32.4; and

(3) The Contractor agrees that any financial loss resulting from the failure or inability of the protege firm to repay any unliquidated advance payments is the sole financial responsibility of the Contractor.

(b) For a fixed price type contract, advance payments made to a protege firm shall be paid and administered as if they were 100 percent progress payments. The Contractor shall include as a separate attachment with each Standard Form (SF) 1443, Contractor's Request for Progress Payment, a request for reimbursement of advance payments made to a protege firm. The attachment shall provide a separate calculation of lines 14a through 14e of SF 1443 for each protege, reflecting the status of advance payments made to that protege.

(c) For cost reimbursable contracts, reimbursement of advance payments shall be made via public voucher. The Contractor shall show the amounts of advance payments made to each protege on the public voucher, in the form and detail directed by the cognizant contracting officer or contract auditor.

(End of clause)

96. *FAR 52.233-1 DISPUTES (JULY 2002)

(a) This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C. 601-613).

(b) Except as provided in the Act, all disputes arising under or relating to this contract shall be resolved under this clause.

(c) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to this contract. However, a written demand or written assertion by the Contractor seeking the payment of money exceeding $100,000 is not a claim under the Act until certified. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim under the Act. The submission may be converted to a claim under the Act, by complying with the submission and certification requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

(d)(1) A claim by the Contractor shall be made in writing and, unless otherwise stated in this contract, submitted within 6 years after accrual of the claim to the Contracting Officer for a written decision. A claim by the Government against the Contractor shall be subject to a written decision by the Contracting Officer.

(2) (i) Contractors shall provide the certification specified in paragraph (d)(2)(iii) of this clause when submitting any claim exceeding $100,000.

(ii) The certification requirement does not apply to issues in controversy that have not been submitted as all or part of a claim.

(iii) The certification shall state as follows:

'I certify that the claim is made in good faith; that the supporting data are accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the Contractor believes the Government is liable; and that I am duly authorized to certify the claim on behalf of the Contractor.'

(3) The certification may be executed by any person duly authorized to bind the Contractor with respect to the claim.

(e) For Contractor claims of $100,000 or less, the Contracting Officer must, if requested in writing by the Contractor, render a decision within 60 days of the request. For Contractor-certified claims over $100,000, the Contracting Officer must, within 60 days, decide the claim or notify the Contractor of the date by which the decision will be made.

(f) The Contracting Officer's decision shall be final unless the Contractor appeals or files a suit as provided in the Act.

(g) If the claim by the Contractor is submitted to the Contracting Officer or a claim by the Government is presented to the Contractor, the parties, by mutual consent, may agree to use alternative dispute resolution (ADR). If the Contractor refuses an offer for ADR, the Contractor shall inform the Contracting Officer, in writing, of the Contractor's specific reasons for rejecting the offer.

(h) The Government shall pay interest on the amount found due and unpaid from (1) the date the Contracting Officer receives the claim (certified if required), or (2) the date that payment otherwise would be due, if that date is later, until the date of payment. With regard to claims having defective certifications, as defined in (FAR) 48 CFR 33.201, interest shall be paid from the date that the Contracting Officer initially receives the claim. Simple interest on claims shall be paid at the rate, fixed by the Secretary of the Treasury as provided in the Act, which is applicable to the period during which the Contracting Officer receives the claim and then at the rate applicable for each 6-month period as fixed by the Treasury Secretary during the pendency of the claim.

(i) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under the contract, and comply with any decision of the Contracting Officer.

97. RESERVED.

98. *FAR 52.233-3 PROTEST AFTER AWARD (AUG 1996)

(a) Upon receipt of a notice of protest (as defined in FAR 33.101) or a determination that a protest is likely (see FAR 33.102(d)), the Contracting Officer may, by written order to the Contractor, direct the Contractor to stop performance of the work called for by this contract. The order shall be specifically identified as a stop-work order issued under this clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Upon receipt of the final decision in the protest, the Contracting Officer shall either--

(1) Cancel the stop-work order; or

(2) Terminate the work covered by the order as provided in the Default, or the Termination for Convenience of the Government, clause of this contract.

(b) If a stop-work order issued under this clause is canceled either before or after a final decision in the protest, the Contractor shall resume work. The Contracting Officer shall make an equitable adjustment in the delivery schedule or contract price, or both, and the contract shall be modified, in writing, accordingly, if--

(1) The stop-work order results in an increase in the time required for, or in the Contractor's cost properly allocable to, the performance of any part of this contract; and

(2) The Contractor asserts its right to an adjustment within 30 days after the end of the period of work stoppage; provided, that if the Contracting Officer decides the facts justify the action, the Contracting Officer may receive and act upon a proposal at any time before final payment under this contract.

(c) If a stop-work order is not canceled and the work covered by the order is terminated for the convenience of the Government, the Contracting Officer shall allow reasonable costs resulting from the stop-work order in arriving at the termination settlement.

(d) If a stop-work order is not canceled and the work covered by the order is terminated for default, the Contracting Officer shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop-work order.

(e) The Government's rights to terminate this contract at any time are not affected by action taken under this clause.

(f) If, as the result of the Contractor's intentional or negligent misstatement, misrepresentation, or miscertification, a protest related to this contract is sustained, and the Government pays costs, as provided in FAR 33.102(b)(2) or 33.104(h)(1), the Government may require the Contractor to reimburse the Government the amount of such costs. In addition to any other remedy available, and pursuant to the requirements of Subpart 32.6, the Government may collect this debt by offsetting the amount against any payment due the Contractor under any contract between the Contractor and the Government.

99. RESERVED.

100. FAR 52.236-2 DIFFERING SITE CONDITIONS (APR 1984)

(a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of

(1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or

(2) unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.

(b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the contract modified in writing accordingly.

(c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required, provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.

(d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

101. *FAR 52.236-3 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984)

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to

(1) conditions bearing upon transportation, disposal, handling, and storage of materials;

(2) the availability of labor, water, electric power, and roads;

(3) uncertainties of weather, river stages, tides, or similar physical conditions at the site;

(4) the conformation and conditions of the ground; and

(5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions

described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Government.

(b) The Government assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Government. Nor does the Government assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

102. *FAR 52.236-5 MATERIAL AND WORKMANSHIP (APR 1984)

(a) All equipment, material, and articles incorporated into the work covered by this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.

(b) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. When directed to do so, the Contractor shall submit samples for approval at the Contractor's expense, with all shipping charges prepaid. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.

(c) All work under this contract shall be performed in a skillful and workmanlike manner. The Contracting Officer may require, in writing, that the Contractor remove from the work any employee the Contracting Officer deems incompetent, careless, or otherwise objectionable.

103. *FAR 52.236-6 SUPERINTENDENCE BY THE CONTRACTOR (APR 1984)

At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the work site a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.

104. FAR 52.236-7 PERMITS AND RESPONSIBILITIES (NOV 1991)

The Contractor shall, without additional expense to the Government, be responsible for obtaining any necessary licenses and permits, and for complying with any Federal, State, and municipal laws, codes, and regulations applicable to the performance of the work. The Contractor shall also be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.

105. *FAR 52.236-8 OTHER CONTRACTS (APR 1984)

The Government may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with Government employees

and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by Government employees.

106. *FAR 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (APR 1984)

(a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

(b) The Contractor shall protect from damage all existing improvements and utilities

(1) at or near the work site, and

(2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refused to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

107. FAR 52.236-10 OPERATIONS AND STORAGE AREAS (APR 1984)

(a) The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.

(b) Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.

(c) The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

108. *FAR 52.236-11 USE AND POSSESSION PRIOR TO COMPLETION (APR 1984)

(a) The Government shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the Government intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The Government's possession or use shall not be deemed an acceptance of any work under the contract.

(b) While the Government has such possession or use, the Contractor shall be relieved of the responsibility for the loss of or damage to the work resulting from the Government's possession or use, notwithstanding the terms of the clause in this contract entitled "Permits and Responsibilities." If prior possession or use by the Government delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

109. *FAR 52.236-12 CLEANING UP (APR 1984)

The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. Before completing the work, the Contractor shall remove from the work and premises any rubbish, tools, scaffolding, equipment, and materials that are not the property of the Government. Upon completing the work, the Contractor shall leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer.

110. *FAR 52.236-13 ACCIDENT PREVENTION-ALTERNATE I (NOV 1991)

(a) The Contractor shall provide and maintain work environments and procedures which will (1) safeguard the public and Government personnel, property, materials, supplies, and equipment exposed to Contractor operations and activities; (2) avoid interruptions of Government operations and delays in project completion dates; and (3) control costs in the performance of this contract.

(b) For these purposes on contracts for construction or dismantling, demolition, or removal of improvements, the Contractor shall--

(1) Provide appropriate safety barricades, signs, and signal lights;

(2) Comply with the standards issued by the Secretary of Labor at 29 CFR Part 1926 and 29 CFR Part 1910; and

(3) Ensure that any additional measures the Contracting Officer determines to be reasonably necessary for the purposes are taken.

(c) If this contract is for construction or dismantling, demolition or removal of improvements with any Department of Defense agency or component, the Contractor shall comply with all pertinent provisions of the latest version of U.S. Army Corps of engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation.

(d) Whenever the Contracting Officer becomes aware of any noncompliance with these requirements or any condition which poses a serious or imminent danger to the health or safety of the public or Government personnel, the Contracting Officer shall notify the Contractor orally, with written confirmation, and request immediate initiation of corrective action. This notice, when delivered to the Contractor or the Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not be entitled to any equitable adjustment of the contract price or extension of the performance schedule on any stop work order issued under this clause.

(e) The Contractor shall insert this clause, including this paragraph (e), with appropriate changes in the designation of the parties, in subcontractors.

(f) Before commencing the work, the Contractor shall--

(1) Submit a written proposed plan for implementing this clause. The plan shall include an analysis of the significant hazards to life, limb, and property inherent in contract work performance and a plan for controlling these hazards; and

(2) Meet with representatives of the Contracting Officer to discuss and develop a mutual understanding relative to administration of the overall safety program.

111. *FAR 52.236-14 AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984)

(a) The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

(b) The Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

112. FAR 52.236-15 SCHEDULES FOR CONSTRUCTION CONTRACTS (APR 1984)

(a) The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Contracting Officer, prepare and submit to the Contracting Officer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring materials, plant, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments until the Contractor submits the required schedule.

(b) The Contractor shall enter the actual progress on the chart as directed by the Contracting Officer, and upon doing so shall immediately deliver three copies of the annotated schedule to the Contracting Officer. If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

(c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this clause shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of this contract.

113. *FAR 52.236-17 LAYOUT OF WORK (APR 1984)

The Contractor shall lay out its work from Government-established base lines and bench marks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through its negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

114. FAR 52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB

1997)

(a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

(b) Wherever in the specifications or upon the drawings the words "directed," "required," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the "direction," "requirement," "order," "designation," or "prescription," of the Contracting Officer is intended and similarly the words "approved," "acceptable," "satisfactory," or words of like import shall mean "approved by," or "acceptable to," or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.

(c) Where "as shown," "as indicated," "as detailed," or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place," that is "furnished and installed."

(d) Shop drawings means drawings, submitted to the Government by the Contractor, subcontractor, or any lower tier subcontractor pursuant to a construction contract, showing in detail

(1) the proposed fabrication and assembly of structural elements, and

(2) the installation (i.e., fit, and attachment details) of materials or equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the Government's reasons therefor. Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.

(f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Contracting Officer approves any such variation, the Contracting Officer shall issue an appropriate contract modification, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.

(g) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the Contracting Officer and one set will be returned to the Contractor.

115. RESERVED.

116. RESERVED.

117. RESERVED.

118. *FAR 52.236-26 PRECONSTRUCTION CONFERENCE (FEB 1995)

If the Contracting Officer decides to conduct a preconstruction conference, the successful offeror will be notified and will be required to attend. The Contracting Officer's notification will include specific details regarding the date, time, and location of the conference, any need for attendance by subcontractors, and information regarding the items to be discussed.

119. DFARS 252.236-7000 MODIFICATION OF PROPOSALS - PRICE BREAKDOWN (DEC 1991)

(a) The Contractor shall furnish a price breakdown, itemized as required and within the time specified by the Contracting Officer, with any proposal for a contract modification.

(b) The price breakdown--

(1) Must include sufficient detail to permit an analysis of profit, and of all costs for--

(i) Material;

(ii) Labor,

(iii) Equipment;

(iv) Subcontracts; and

(2) Most cover all work involved in the modification, whether the work was deleted, added, or changed.

(c) The Contractor shall provide similar price breakdowns to support any amounts claimed for subcontracts.

(d) The Contractor's proposal shall include a justification for any time extension proposed.

120. *FAR 52.242-13 BANKRUPTCY (JUL 1995)

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish, by certified mail or electronic commerce method authorized by the contract, written notification of the bankruptcy to the Contracting Officer responsible for administering the contract. This notification shall be furnished within five days of the initiation of the proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identity of the court in which the bankruptcy petition was filed, and a listing of Government contract numbers and contracting offices for all Government contracts against which final payment has not been made. This obligation remains in effect until final payment under this contract.

121. *FAR 52.242-14 SUSPENSION OF WORK (APR 1984)

(a) The Contracting Officer may order the Contractor, in writing, to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of the Government.

(b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified in this contract (or within a reasonable time if not specified), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by the unreasonable suspension, delay, or interruption, and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor, or for which an equitable adjustment is provided for or excluded under any other term or condition of this contract.

(c) A claim under this clause shall not be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this

requirement shall not apply as to a claim resulting from a suspension order), and (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption, but not later than the date of final payment under the contract.

122. DFARS 252.242-7005 COST/SCHEDULE STATUS REPORT (MAR 1998)

(a) The Contractor shalluse management procedures in the performance of this contract that provide for--

(1) Planning and control of costs;

(2) Measurement of performance (value for completed tasks); and

(3) Generation of timely and reliable information for the cost/schedule status report (C/SSR).

(b) As a minimum, these procedures must provide for--

(1) Establishing the time-phased budgeted cost of work scheduled (including work authorization, budgeting, and scheduling), the budgeted cost for work performed, the actual cost of work performed, the budget at completion, the estimate at completion, and provisions for subcontractor performance measurement and reporting;

(2) Applying all direct and indirect costs and provisions for use and control of management reserve and undistributed budget;

(3) Incorporating changes to the contract budget base for both Government directed changes and internal replanning;

(4) Establishing constraints to preclude subjective adjustment of data to ensure performance measurement remains realistic. The total allocated budget may exceed the contract budget base only after consultation with the Contracting Officer. For cost-reimbursement contracts, the contract budget base shall exclude changes for cost growth increases, other than for authorized changes to the contract scope; and

(5) Establishing the capability to accurately identify and explain significant cost and schedule variances, both on a cumulative basis and projected at completion basis.

(c) The Offeror/Contractor may use a cost/schedule control system that has been recognized by the congnizant Administrative Contracting Officer (ACO) as complying with the earned value management system criteria provided in DoD 5000.2-R, Manadatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs.

(d) The Government may require integrated baseline reviews. Such reviews shallbe scheduled as early as practicable and should be conducted within 180 calendar days after (1) contract award, (2) the exercise of significant contract options, or (3) the incorporation of major modifications. The objective of the integrated baseline review is for the Government and the Contractor to jointly assess areas, such as the Contractor's planning, to ensure complete coverage of the statement of work, logical scheduling of the work activities, adequate resourcing, and identification of inherent risks.

(e) The Contractor shall provide access to all pertinent records, company procedures, and data requested by the Contracting Officer, or authorized representative, to--

(1) Show proper implementation of the procedures generating the cost schedule information being used to satisfy the C/SSR contractual data requirements to the Government; and

(2) Ensure continuing application of the accepted company procedures in satisfying the C/SSR data item.

(f) The Contractor shall submit any substantive changes to the procedures and their impact to the ACO for review.

(g) The Contractor shall require a subcontractor to furnish C/SSR in each case where the subcontract is other than firm fixed-price, is 12 months or more in duration, and has critical or significant tasks related to the prime contract. Critical or significant tasks shall be defined by mutual agreement between the Government and Contractor. Each subcontractor's reported cost and schedule information shall be incorporated into the Contractor's C/SSR.

(End of clause)

123. RESERVED.

124. FAR 52.243-4 CHANGES (AUG 1987)

(a) The Contracting Officer may, at any time, without notice to the sureties, if any, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract, including changes--

(1) In the specifications (including drawings and designs);
(2) In the method or manner of performance of the work;
(3) In the Government-furnished facilities, equipment, materials, services, or site; or
(4) Directing acceleration in the performance of the work.

(b) Any other written or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating

(1) the date, circumstances, and source of the order and
(2) that the Contractor regards the order as a change order.

(c) Except as provided in this clause, no order, statement, or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.

(d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for an adjustment based on defective specifications, no adjustment for any change under paragraph (b) of this clause shall be made for any costs incurred more than 20 days before the Contractor gives written notice as required. In the case of defective specifications for which the Government is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.

(e) The Contractor must assert its right to an adjustment under this clause within 30 days after

(1) receipt of a written change order under paragraph (a) of this clause or
(2) the furnishing of a written notice under paragraph (b) of this clause, by submitting to the Contracting Officer a written statement describing the general nature and amount of the proposal, unless this period is extended by the Government. The statement of proposal for adjustment may be included in the notice under paragraph (b) above.

(f) No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

125. DFARS 252.243-7001 PRICING OF CONTRACT MODIFICATIONS (DEC 1991)

When costs are a factor in any price adjustment under this contract, the contract cost principles and procedures in FAR Part 31 and DRARS Part 231, in effect on the date of this contract, apply.

126. DFARS 252.243-7002 REQUESTS FOR EQUITABLE ADJUSTMENT (MAR 1998)

(a) The amount of any request for equitable adjustment to contract terms shall accurately reflect the contract adjustment for which the Contractor believes the Government is liable. The request shall include only costs for performing the change, and shall not include any costs that already have been reimbursed or that have been separately claimed. All indirect costs included in the request shall be properly allocable to the change in accordance with applicable acquisition regulations.

(b)In accordance with 10 U.S.C. 2410(a), any request for equitable adjustment to contract terms that exceeds the simplified acquisition threshold shall bear, at the time of submission, the following certificate executed by an individual authorized to certify the request on behalf of the Contractor:
I certify that the request is made in good faith, and that the supporting data are accurate and complete to the best of may knowledge and belief.

(Official's Name)

(Title)

(c) The certification in paragraph (b) of this clause requires full disclosure of all relevant facts, including--

(1) Cost or pricing data if required in accordance with subsection 15.403-4 of the Federal Acquisition Regulation; and

(2) Information other than cost or pricing data, in accordance with subsection 15.403-3 of the FAR, including actual cost data and data to support any estimated costs, even if cost or pricing data are not required.

(d) The certification requirement in paragraph (b) of this clause does not apply to----

(1) Requests for routine contract payments; for example, requests for payment for accepted supplies and services, routine vouchers under a cost-reimbursement type contract, or progress payment invoices; or

(2) Final adjustment under an incentive provision of the contract.

(End of clause)

127. *FAR 52.244-2 SUBCONTRACTS (AUG 1998)

(a) Definitions. As used in this clause--

"Approved purchasing system" means a Contractor's purchasing system that has been reviewed and approved in accordance with Part 44 of the Federal Acquistion Regulation (FAR).

"Consent of subcontract" means the Contracting Officer's written consent for the Contractor to enter into a particular subcontract.

"Subcontract," means any contract, as defined in FAR Subpart 2.1, entered into by a subcontractor to furnish supplies or sevices for performance of the the prime contract or a subcontract. It includes, but is not limited to purchase orders, and changes and modifications to purchase orders.

(b) This clause does not apply to subcontracts for special test equipment when the contract contains the clause at FAR 52.245-18, Special Test Equipment.

(c) When this clause is included in a fixed-price type contract, consent to subcontract is required only on unpriced contract actions (including unpriced modification or unpriced delivery orders), and only if required in accordance with paragraph (d) or (e) of this clause.

(d) If the Contractor does not have an approved purchasing system, consent to subcontract is required for any subcontract that--

(1) Is of the cost-reimbursement, time-and-materials, or labor-hour type; or

(2) Is fixed-price and exceeds--

(i) For a contract awarded by the Department of Defense, the Coast Guard, or the National Aeronautics and Space Administration, the greater of the simplified theshold or 5 percent of the total estimated cost of the contract; or

(ii) For a contract awarded by a civilian agency other that the Coast Guard and the National Aeronautics and Space Administration, either the the simplified theshold or 5 percent of the total estimated cost of the contract.

(e) If the Contractor has an approved purchasing system, the Contractor nevertheless shall obtain the Contracting Officer's written consent before placing the following subcontracts:

_____
_____
_____

(f)(1) The Contractor shall notify the Contracting Officer reasonably in advance of placing any subcontract or modification thereof for which consent is required under paragraph (c), (d), or (e) of this clause, including the following information:

(i) A description of the supplies or services to be subcontracted.
(ii) Identification of the type of subcontract to be used.
(iii) Identification of the proposed subcontractor.
(iv) The proposed subcontract price.
(v) The subcontractor's current, complete, and accurate cost or pricing data and Certificate of Current Cost or Pricing Data, if required by other contract provisions.
(vi) The subcontractor's Disclosure Statement or Certificate relating to Cost Accounting Standards when such data are required by other provisions of this contract.
(vii) A negotiation memorandum reflecting--
(A) The principal elements of the subcontract price negotiations;
(B) The most significant considerations controlling establishment of initial or revised prices;
(C) The reason cost or pricing data were or were not required;
(D) The extent, if any, to which the Contractor did not rely on the subcontractor's cost or pricing data in determining the price objective and in negotiating the final price;
(E) The extent to which it was recognized in the negotiation that the subcontractor's cost or pricing data were not accurate, complete, or current; the action taken by the Contractor and subcontractor; and the effect of any such defective data on the total price negotiated;
(F) The reasons for any significant difference between the Contractor's price objective and the price negotiated; and
(G) A complete explanation of the incentive fee or profit plan when incentives are used. The explanation shall identify each critical performance element, management decisions used to quantify each incentive element, reasons for the incentives, and a summary of all trade-off possibilities considered.

(2) The Contractor is not required to notify the Contracting Officer in advance of entering into any subcontract for which consent is not required under paragraph (c), (d), or (e) of this clause.

(g) Unless the consent or approval specifically provides otherwise, neither consent by the Contracting Officer to any subcontract nor approval of the Contractor's purchasing system shall constitute a determination--
(1) Of the acceptability of any subcontract terms or conditions;
(2) Of the acceptability of any cost under this contract; or
(3) To relieve the Contractor of any responsibility for performing this contract.

(h) No subcontract or modification thereof placed under this contract shall provide for payment on a cost-plus-a-percentage-of-cost basis, and any fee payable under cost-reimbursement subcontracts shall not exceed the fee limitations in FAR 15.404-4(c)(4)(i).

(i) The Contractor shall give the Contracting Officer immediate written notice of any action or suit filed and prompt notice of any claim made against the Contractor by any subcontractor or vendor that, in the opinion of the Contractor, may result in litigation related in any way to this contract, with respect to which the Contractor may be entitled to reimbursement by the Government.

(j) The Government reserves the right to review the Contractor's purchasing system as set forth in FAR Subpart 44.3.

(k) Paragraphs (d) and (f) of this clause do not apply to the following subcontracts, which ere evaluated during negotiations:

_____
_____
_____
(End of clause)

128. RESERVED.

129. FAR 52.244-6 SUBCONTRACTS FOR COMMERCIAL ITEMS (JULY 2004)

(a) *Definitions.* As used in this clause—

"Commercial item" has the meaning contained in Federal Acquisition Regulation 2.101, Definitions.

"Subcontract" includes a transfer of commercial items between divisions, subsidiaries, or affiliates of the Contractor or subcontractor at any tier.

(b) To the maximum extent practicable, the Contractor shall incorporate, and require its subcontractors at all tiers to incorporate, commercial items or nondevelopmental items as components of items to be supplied under this contract.

(c)(1) The Contractor shall insert the following clauses in subcontracts for commercial items:

(i) 52.219-8, Utilization of Small Business Concerns (May 2004) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds $500,000 ($1,000,000 for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer subcontracting opportunities.

(ii) 52.222-26, Equal Opportunity (Apr 2002) (E.O. 11246).

(iii) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (Dec 2001) (38 U.S.C. 4212(a));

(iv) 52.222-36, Affirmative Action for Workers with Disabilities (June 1998) (29 U.S.C. 793).

(v) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (APR 2003) (46 U.S.C. Appx 1241 and 10 U.S.C. 2631) (flow down required in accordance with paragraph (d) of FAR clause 52.247-64).

(2) While not required, the Contractor may flow down to subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

(d) The Contractor shall include the terms of this clause, including this paragraph (d), in subcontracts awarded under this contract. (End of clause)

130. *FAR 52.245-2 GOVERNMENT PROPERTY (FIXED-PRICE CONTRACTS) (MAY 2004) [For Government Property over $100,000]

(a) Government-furnished property.

(1) The Government shall deliver to the Contractor, for use in connection with and under the terms of this contract, the Government-furnished property described in the Schedule or specifications together with any related data and information that the Contractor may request and is reasonably required for the intended use of the property (hereinafter referred to as "Government-furnished property").

(2) The delivery or performance dates for this contract are based upon the expectation that Government-furnished property suitable for use (except for property furnished "as is") will be delivered to the Contractor at the times stated in the Schedule or, if not so stated, in sufficient time to enable the Contractor to meet the contract's delivery or performance dates.

(3) If Government-furnished property is received by the Contractor in a condition not suitable for the intended use, the Contractor shall, upon receipt of it, notify the Contracting Officer, detailing the facts, and, as directed by the Contracting Officer and at Government expense, either repair, modify, return, or otherwise dispose of the property. After completing the directed action and upon written request of the Contractor, the Contracting Officer shall make an equitable adjustment as provided in paragraph (h) of this clause.

(4) If Government-furnished property is not delivered to the Contractor by the required time, the Contracting Officer shall, upon the Contractor's timely written request, make a determination of the delay, if any, caused the Contractor and shall make an equitable adjustment in accordance with paragraph (h) of this clause.

(b) Changes in Government-furnished property.

(1) The Contracting Officer may, by written notice,

(i) decrease the Government-furnished property provided or to be provided under this contract, or

(ii) substitute other Government-furnished property for the property to be provided by the Government, or to be acquired by the Contractor for the Government, under this contract. The Contractor shall promptly take such action as the Contracting Officer may direct regarding the removal, shipment, or disposal of the property covered by such notice.

(2) Upon the Contractor's written request, the Contracting Officer shall make an equitable adjustment to the contract in accordance with paragraph (h) of this clause, if the Government has agreed in the Schedule to make the property available for performing this contract and there is any--

(i) Decrease or substitution in this property pursuant to subparagraph (b)(1) above; or

(ii) Withdrawal of authority to use this property, if provided under any other contract or lease.

(c) Title in Government property. (1) The Government shall retain title to all Government-furnished property.

(2) All Government-furnished property and all property acquired by the Contractor, title to which vests in the Government under this paragraph (collectively referred to as "Government property"), are subject to the provisions of this clause. However, special tooling accountable to this contract is subject to the provisions of the Special Tooling clause and is not subject to the provisions of this clause. Title to Government property shall not be affected by its incorporation into or attachment to any property not owned by the Government, nor shall government property become a fixture or lose its identity as personal property by being attached to any real property.

(3) Title to each item of facilities and special test equipment acquired by the Contractor for the Government under this contract shall pass to and vest in the Government when its use in performing this contract commences or when the Government has paid for it, whichever is earlier, whether or not title previously vested in the Government.

(4) If this contract contains a provision directing the Contractor to purchase material for which the Government will reimburse the Contractor as a direct item of cost under this contract--

(i) Title to material purchased from a vendor shall pass to and vest in the Government upon the vendor's delivery of such material; and

(ii) Title to all other material shall pass to and vest in the Government upon--

(A) Issuance of the material for use in contract performance;

(B) Commencement of processing of the material or its use in contract performance; or

(C) Reimbursement of the cost of the material by the Government, whichever occurs first.

(d) Use of Government property. The Government property shall be used only for performing this contract, unless otherwise provided in this contract or approved by the Contracting Officer.

(e) Property Administration.

(1) The Contractor shall be responsible and accountable for all Government property provided under this contract and shall comply with Federal Acquisition Regulation (FAR) Subpart 45.5, as in effect on the date of this contract.

(2) The Contractor shall establish and maintain a program for the use, maintenance, repair, protection, and preservation of Government property in accordance with sound industrial practice and the applicable provisions of Subpart 45.5 of the FAR.

(3) If damage occurs to Government property, the risk of which has been assumed by the Government under this contract, the Government shall replace the items or the Contractor shall make such repairs as the Government directs. However, if the Contractor cannot effect such repairs within the time required, the Contractor shall dispose of the property as directed by the Contracting Officer. When any property for which the Government is responsible is replaced or repaired, the Contracting Officer shall make an equitable adjustment in accordance with paragraph (h) of this clause.

(4) The Contractor represents that the contract price does not include any amount for repairs or replacement for which the Government is responsible. Repair or replacement of property for which the Contractor is responsible shall be accomplished by the Contractor at its own expense.

(f) Access. The Government and all its designees shall have access at all reasonable times to the premises in which any Government property is located for the purpose of inspecting the Government property.

(g) Risk of loss. Unless otherwise provided in this contract, the Contractor assumes the risk of, and shall be responsible for, any loss or destruction of, or damage to, Government property upon its delivery to the Contractor or upon passage of title to the Government under paragraph (c) of this clause. However, the Contractor is not responsible for reasonable wear and tear to Government property or for Government property properly consumed in performing this contract.

(h) Equitable adjustment. When this clause specifies an equitable adjustment, it shall be made to any affected contract provision in accordance with the procedures of the Changes clause. When appropriate, the Contracting Officer may initiate an equitable adjustment in favor of the Government. The right to an equitable adjustment shall be the Contractor's exclusive remedy. The Government shall not be liable to suit for breach of contract for--

(1) Any delay in delivery of Government-furnished property;

(2) Delivery of Government-furnished property in a condition not suitable for its intended use;

(3) A decrease in or substitution of Government-furnished property; or

(4) Failure to repair or replace Government property for which the Government is responsible.

(i) *Government property disposal*. Except as provided in paragraphs (i)(1)(i), (i)(2), and (i)(8)(i) of this clause, the Contractor shall not dispose of Government property until authorized to do so by the Plant Clearance Officer.

(1) *Scrap (to which the Government has obtained title under paragraph (c) of this clause)*.—

(i) *Contractor with an approved scrap procedure*.—(A) The Contractor may dispose of scrap resulting from production or testing under this contract without Government approval. However, if the scrap requires demilitarization or is sensitive property, the Contractor shall submit the scrap on an inventory disposal schedule.

(B) For scrap from other than production or testing the Contractor may prepare scrap lists in lieu of inventory disposal schedules (provided such lists are consistent with the approved scrap procedures), except that inventory disposal schedules shall be submitted for scrap aircraft or aircraft parts and scrap that—

(1) Requires demilitarization;

(2) Is a classified item;

(3) Is generated from classified items;

(4) Contains hazardous materials or hazardous wastes;

(5) Contains precious metals; or

(6) Is dangerous to the public health, safety, or welfare.

(ii) *Contractor without an approved scrap procedure*. The Contractor shall submit an inventory disposal schedule for all scrap.

(2) *Pre-disposal requirements*. When the Contractor determines that a property item acquired or produced by the Contractor, to which the Government has obtained title under paragraph (c) of this clause, is no longer needed for performance of this contract, the Contractor, in the following order

of priority:

(i) May purchase the property at the acquisition cost.

(ii) Shall make reasonable efforts to return unused property to the appropriate supplier at fair market value (less, if applicable, a reasonable restocking fee that is consistent with the supplier's customary practices).

(iii) Shall list, on Standard Form 1428, Inventory Disposal Schedule, property that was not purchased under paragraph (i)(2)(i) of this clause, could not be returned to a supplier, or could not be used in the performance of other Government contracts.

(3) *Inventory disposal schedules*.—(i) The Contractor shall use Standard Form 1428, Inventory Disposal Schedule, to identify—

(A) Government-furnished property that is no longer required for performance of this contract, provided the terms of another Government contract do not require the Government to furnish that property for performance of that contract; and

(B) Property acquired or produced by the Contractor, to which the Government has obtained title under paragraph (c) of this clause, that is no longer required for performance of that contract.

(ii) The Contractor may annotate inventory disposal schedules to identify property the Contractor wishes to purchase from the Government.

(iii) Unless the Plant Clearance Officer has agreed otherwise, or the contract requires electronic submission of inventory disposal schedules, the Contractor shall prepare separate inventory disposal schedules for—

(A) Special test equipment with commercial components;

(B) Special test equipment without commercial components;

(C) Printing equipment;

(D) Computers, components thereof, peripheral equipment, and related equipment;

(E) Precious Metals;

(F) Nonnuclear hazardous materials or hazardous wastes; or

(G) Nuclear materials or nuclear wastes.

(iv) Property with the same description, condition code, and reporting location may be grouped in a single line item. The Contractor shall describe special test equipment in sufficient detail to permit an understanding of the special test equipment's intended use.

(4) *Submission requirements*. The Contractor shall submit inventory disposal schedules to the Plant Clearance Officer no later than—

(i) Thirty days following the Contractor's determination that a Government property item is no longer required for performance of the contract;

(ii) Sixty days, or such longer period as may be approved by the Plant Clearance Officer, following completion of contract deliveries or performance; or

(iii) One hundred twenty days, or such longer period as may be approved by the Plant Clearance Officer, following contract termination in whole or in part.

(5) *Corrections*. The Plant Clearance Officer may require the Contractor to correct an inventory disposal schedule or may reject a schedule if the property identified on the schedule is not accountable under this contract or is not in the quantity or condition indicated.

(6) *Postsubmission adjustments*. The Contractor shall provide the Plant Clearance Officer at least 10 working days advance written notice of its intent to remove a property item from an approved inventory disposal schedule. Unless the Plant Clearance Officer objects to the intended schedule adjustment within the notice period, the Contractor may make the adjustment upon expiration of the notice period.

(7) *Storage*.—(i) The Contractor shall store the property identified on an inventory disposal schedule pending receipt of disposal instructions. The Government's failure to provide disposal instructions within

120 days following acceptance of an inventory disposal schedule might entitle the Contractor to an equitable adjustment for costs incurred to store such property on or after the 121st day.

(ii) The Contractor shall obtain the Plant Clearance Officer's approval to remove Government property from the premises at which the property is currently located prior to receipt of final disposition instructions. If approval is granted, any costs incurred by the Contractor to transport or store the property shall not increase the price or fee of any Government contract. The storage facility shall be appropriate for assuring the property's physical safety and suitability for use. Approval does not relieve the Contractor of any liability under this contract for such property.

(8) *Disposition instructions*.—(i) If the Government does not provide disposition instructions to the Contractor within 45 days following acceptance of a scrap list, the Contractor may dispose of the listed scrap in accordance with the Contractor's approved scrap procedures.

(ii) The Contractor shall prepare for shipment, deliver f.o.b. origin, or dispose of Government property as directed by the Plant Clearance Officer. The Contractor shall remove and destroy any markings identifying the property as Government property prior to disposing of the property.

(iii) The Contracting Officer may require the Contractor to demilitarize the property prior to shipment or disposal. Any equitable adjustment incident to the Contracting Officer's direction to demilitarize Government property shall be made in accordance with paragraph (h) of this clause.

(9) *Disposal proceeds*. The Contractor shall credit the net proceeds from the disposal of Government property to the price or cost of work covered by this contract or to the Government as the Contracting Officer directs.

(10) *Subcontractor inventory disposal schedules*. The Contractor shall require a subcontractor that is using property accountable under this contract at a subcontractor-managed site to submit inventory disposal schedules to the Contractor in sufficient time for the Contractor to comply with the requirements of paragraph (i)(4) of this clause.

(j) *Abandonment of Government property*.—(1) The Government will not abandon sensitive Government property without the Contractor's written consent.

(2) The Government, upon notice to the Contractor, may abandon any nonsensitive Government property in place at which time all obligations of the Government regarding such abandoned property shall cease.

(3) The Government has no obligation to restore or rehabilitate the Contractor's premises under any circumstances; however, if Government-furnished property is withdrawn or is unsuitable for the intended use, or if other Government property is substituted, then the equitable adjustment under paragraph (h) of this clause may properly include restoration or rehabilitation costs.

(k) Communications. All communications under this clause shall be in writing.

(l) Overseas contracts. If this contract is to be performed outside of the United States of America and its outlying areas, the words "Government" and "Government-furnished" (wherever they appear in this clause) shall be construed as "United States Government" and "United States Government-furnished," respectively.

131. *FAR 52.245-4 GOVERNMENT-FURNISHED PROPERTY (SHORT FORM) (JUNE 2003) [<u>For Government Property $100,000 or Less</u>]

(a) The Government shall delivery to the Contractor, at the time and locations stated in this contract, the Government-furnished property described in the Schedule or specifications. If that property, suitable for its intended use, is not delivered to the Contractor, the Contracting Officer shall equitably adjust affected provisions of this contract in accordance with the Changed clause when--

(1) The Contractor submits a timely written request for an equitable adjustment; and

(2) The facts warrant an equitable adjustment.

(b) Title to Government-furnished property shall remain in the Government. The Contractor shall use the Government-furnished property only in connection with this contract. The Contractor shall maintain adequate property control records in accordance with sound industrial practice and will make such records available for Government inspection at all reasonable times, unless the clause at Federal Acquisition Regulation 52.245-1, Property Records, is included in this contract.

(c) Upon delivery of Government-furnished property to the Contractor, the Contractor assumes the risk and responsibility for its loss or damage, except--

(1) For reasonable wear and tear;

(2) To the extent property is consumed in performing this contract; or

(3) As otherwise provided for by the provisions of this contract.

(d) Upon completing this contract, the Contractor shall follow the instructions of the Contracting Officer regarding the disposition of all Government-furnished property not consumed in performing this contract or previously delivered to the Government. The Contractor shall prepare for shipment, deliver f.o.b. origin, or dispose of the Government property, as may be directed or authorized by the Contracting Officer. The net proceeds of any such disposal shall be credited to the contract price or shall be paid to the Government as directed by the Contracting Officer.

(e) If this contract is to be performed outside the United States of America and its outlying areas, the words "Government" and "Government-furnished" (wherever they appear in this clause) shall be construed as "United States Government" and "United States Government-furnished," respectively.

132. *FAR 52.246-12 INSPECTION OF CONSTRUCTION (AUG 1996)

(a) Definition. "Work" includes, but is not limited to, materials, workmanship, and manufacture and fabrication of components.

(b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. The Contractor shall maintain complete inspection records and make them available to the Government. All work shall be conducted under the general direction of the Contracting Officer and is subject to Government inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.

(c) Government inspections and tests are for the sole benefit of the Government and do not--

(1) Relieve the Contractor of responsibility for providing adequate quality control measures;

(2) Relieve the Contractor of responsibility for damage to or loss of the material before acceptance;

(3) Constitute or imply acceptance; or

(4) Affect the continuing rights of the Government after acceptance of the completed work under paragraph (i) below.

(d) The presence or absence of a Government inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specification without the Contracting Officer's written authorization.

(e) The Contractor shall promptly furnish, at no increase in contract price, all facilities,labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Contracting Officer. The Government may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. The Government shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.

(f) The Contractor shall, without charge, replace or correct work found by the Government not to conform to contract requirements, unless in the public interest the Government consents to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

(g) If the Contractor does not promptly replace or correct rejected work, the Government may

(1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor or

(2) Terminate for default the Contractor's right to proceed.

(h) If, before acceptance of the entire work, the Government decides to examine already completed work by removing it or tearing it out, the Contractor, on request, shall promptly furnish all necessary facilities, labor, and material. If the work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray the expenses of the examination and of satisfactory reconstruction. However, if the work is found to meet contract requirements, the Contracting Officer shall make an equitable adjustment for the additional services involved in the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.

(i) Unless otherwise specified in the contract, the Government shall accept, as promptly as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer determines can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the Government's rights under any warranty or guarantee.

133. *FAR 52.246-21 WARRANTY OF CONSTRUCTION (MAR 1994)

(a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

(b) This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

(c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of--

(1) The Contractor's failure to conform to contract requirements; or

(2) Any defect of equipment, material, workmanship, or design furnished.

(d) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

(e) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.

(f) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(g) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall--

(1) Obtain all warranties that would be given in normal commercial practice;

(2) Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and

(3) Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

(h) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(i) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

(j) This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

134. DFARS 252.247-7023 TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)

(a) Definitions.

As used in this clause--

(1) "Components" means articles, materials, and supplies incorporated directly into end products at any level of manufacture, fabrication, or assembly by the Contractor or any subcontractor.

(2) 'Department of Defense" (DOD) means the Army, Navy, Air Force, Marine Corps, and defense agencies.

(3) "Foreign flag vessel" means any vessel that is not a U.S.-flag vessel.

(4) "Ocean transportation" means any transportation aboard a ship, vessel, boat, barge, or ferry through international waters.

(5) "Subcontractor" means a supplier, materialman, distributor, or vendor at any level below the prime Contractor whose contractual obligation to perform results from, or is conditioned upon, award of the prime contract and who is performing any part of the work or other requirement of the prime contract.

(6) "Supplies" means all property, except land and interests in lard, that is clearly identifiable for eventual use by or owned by the DoD at the time of transportation by sea.

(i) An item is clearly identifiable for eventual use by the DoD if, for example, the contract documentation contains a reference to a DoD contract number or a military destination.

(ii) "Supplies" includes (but is not limited to) public works; buildings and facilities; ships; floating equipment and vessels of every character, type, and description, with parts, subassemblies, accessories, and equipment; machine tools; material; equipment; stores of all kinds; end items; construction materials; and components of the foregoing.

(7) "U.S.-flag vessel" means a vessel of the United States or belonging to the United States, including any vessel registered or having national status under the laws of the United States.

(b) (1) The Contractor shall use U.S. -flag vessels when transporting any supplies by sea under this contract.

(2) A subcontractor transporting supplies by sea under this contract shall use U.S.-flag vessel if--

(i) This Contract is a construction contract; or

(ii) The supplies being transported are-

(A) Noncommercial items; or

(B) Commercial items that-

(1) The Contractor is reselling or distributing to the Government without adding value (generally, the Contractor does not add value to items that it subcontracts for f.o.b. destination shipment);

(2) Are shipped in direct support of U.S. military contingency operations, exercises, or forces deployed in humanitarian or peacekeeping operations; or

(3) Are commissary or exchange cargoes transported outside of the Defense Transportation System in accordance with 10 U.S.C. 2643.

(c) The Contractor and its subcontractors may request that the Contracting Officer authorize shipment in foreign-flag vessels, or designate available U.S.-flag vessels, if the Contractor or a subcontractor believes that--

(1) U.S.-flag vessels are not available for timely shipment;
(2) The freight charges are inordinately excessive or unreasonable; or
(3) Freight charges are higher that charges to private persons for transportation of like goods.

(d) The Contractor must submit any request for use of other than U.S.-flag vessels in writing to the Contracting Officer at least 45 days prior to the sailing date necessary to meet its delivery schedules. The Contracting Officer will process requests submitted after such date(s) as expeditiously as possible, but the Contracting Officer's failure to grant approvals to meet the shipper's sailing date will not of itself constitute a compensable delay under this or any other clause of this contract. Requests shall contain at a minimum--

(1) Type, weight, and cube of cargo;
(2) Required shipping date:
(3) Special handling and discharge requirements;
(4) Loading and discharge points;
(5) Name of shipper and consignee;
(6) Prime contract number, and
(7) A documented description of efforts made to secure U.S.-flag vessels, including points of contact (with names and telephone numbers) with at least two U.S.-flag carriers contacted. Copies of telephone notes, telegraphic and facsimile message or letters will be sufficient for this purpose.

(e) The Contractor shall, within 30 days after each shipment covered by this clause, provide the Contracting Officer and the Division of National Cargo, Office of Market Development, Maritime Administration, U.S. Department of Transportation, Washington, DC 20590, one copy of the rated on board vessel operating carrier's ocean bill of lading, which shall contain the following information--

(1) Prime contract number;
(2) Name of vessel;
(3) Vessel flag of registry;
(4) Date of loading;
(5) Port of loading;
(6) Port of final discharge;
(7) Description of commodity;
(8) Gross weight in pounds and cubic feet if available;
(9) Total ocean freight in U.S. dollars; and
(10) Name of the steamship company.

(f) The Contractor agrees to provide with its final invoice under this contract a representation that to the best of its knowledge and belief--

(1) No ocean transportation was used in the performance of this contract;
(2) Ocean transportation was used and only U.S.-flag vessels were used for all ocean shipments under the contract;
(3) Ocean transportation was used, and the Contractor had the written consent of the Contracting Officer for all non-U.S.-flag ocean transportation; or
(4) Ocean transportation was used and some or all of the shipments were made on non-U.S.-flag vessels without the written consent of the Contracting Officer. The Contractor shall describe these shipments in the following format;

ITEM DESCRIPTION	CONTRACT LINE ITEMS	QUANTITY
TOTAL		

(g) If the final invoice does not include the required representation, the Government will reject and return it to the Contractor as an improper invoice for the purposes of the Prompt Payment clause of this contract. In the event there has been unauthorized use of non-U.S.-flag vessels in the performance of this contract, the Contracting Officer is entitled to equitably adjust the contract, based on the unauthorized use.

(h) The Contractor shall include this clause, including this paragraph (h) in all subcontracts under this contract that-

(1) Exceed the simplified acquistion threshold in Part 2 of the Federal Acquisition Regulation; and

(2) Are for a type of supplies described in paragraph (b) (2) of this clause.

135. DFARS 252.247-7024 NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)

(a) The Contractor has indicated by the response to the solicitation provision, Representation of Extent of Transportation by Sea, that it did not anticipate transporting by sea any supplies. If, however, after the award of this contract, the Contractor learns that supplies, as defined in the Transportation of Supplies by Sea clause of this contract, will be transported by sea, the Contractor--

(1) Shall notify the Contracting Officer of that fact; and

(2) Hereby agrees to comply with all the terms and conditions of the Transportation of Supplies by Sea clause of this contract.

(b) (1) The Contractor shall use U.S. -flag vessels when transporting any supplies by sea under this contract.

(2) A subcontractor transporting supplies by sea under this contract shall use U.S.-flag vessel if--

(i) This Contract is a construction contract; or

(ii) The supplies being transported are-

(A) Noncommercial items; or

(B) Commercial items that-

(1) The Contractor is reselling or distributing to the Government without adding value (generally, the Contractor does not add value to items that it subcontracts for f.o.b. destination shipment);

(2) Are shipped in direct support of U.S. military contingency operations, exercises, or forces deployed in humanitarian or peacekeeping operations; or

(3) Are commissary or exchange cargoes transported outside of the Defense Transportation System in accordance with 10 U.S.C. 2643.

136. FAR 52.248-3 VALUE ENGINEERING--CONSTRUCTION (FEB 2000) (ALERNATE I (APR 1984)

(a) General. The Contractor is encouraged to develop, prepare, and submit value engineering change proposals (VECP's) voluntarily. The Contractor shall share in any instant contract savings realized from accepted VECP's, in accordance with paragraph (f) of this clause.

(b) Definitions. "Collateral costs," as used in this clause, means agency costs of operation, maintenance, logistic support, or Government-furnished property.

"Collateral savings," as used in this clause, means those measurable net reductions resulting from a VECP in the agency's overall projected collateral costs, exclusive of acquisition savings, whether or not the acquisition cost changes.

"Contractor's development and implementation costs," as used in this clause, means those costs the Contractor incurs on a VECP specifically in developing, testing, preparing, and submitting the VECP, as well as those costs the Contractor incurs to make the contractual changes required by Government acceptance of a VECP.

"Government costs," as used in this clause, means those agency costs that result directly from developing and implementing the VECP, such as any net increases in the cost of testing, operations, maintenance, and logistic support. The term does not include the normal administrative costs of processing the VECP.

"Instant contract savings," as used in this clause, means the estimated reduction in Contractor cost of performance resulting from acceptance of the VECP, minus allowable Contractor's development and implementation costs, including subcontractors' development and implementation costs (see paragraph (h) of this clause).

"Value engineering change proposal (VECP)" means a proposal that--

(1) Requires a change to this, the instant contract, to implement; and

(2) Results in reducing the contract price or estimated cost without impairing essential functions or characteristics; provided, that it does not involve a change--

(i) In deliverable end item quantities only; or

(ii) To the contract type only.

(c) VECP preparation. As a minimum, the Contractor shall include in each VECP the information described in paragraphs (c) (1) through (7) of this clause. If the proposed change is affected by contractually required configuration management or similar procedures, the instructions in those procedures relating to format, identification, and priority assignment shall govern VECP preparation. The VECP shall include the following:

(1) A description of the difference between the existing contract requirement and that proposed, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, and the effect of the change on the end item's performance.

(2) A list and analysis of the contract requirements that must be changed if the VECP is accepted, including any suggested specification revisions.

(3) A separate, detailed cost estimate for

(i) the affected portions of the existing contract requirement and

(ii) the VECP. The cost reduction associated with the VECP shall take into account the Contractor's allowable development and implementation costs, including any amount attributable to subcontracts under paragraph (h) of this clause.

(4) A description and estimate of costs the Government may incur in implementing the VECP, such as test and evaluation and operating and support costs.

(5) A prediction of any effects the proposed change would have on collateral costs to the agency.

(6) A statement of the time by which a contract modification accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.

(7) Identification of any previous submissions of the VECP, including the dates submitted, the agencies and contract numbers involved, and previous Government actions, if known.

(d) Submission. The Contractor shall submit VECP's to the Resident Engineer at the worksite, with a copy to the Contracting Officer.

(e) Government action.

(1) The Contracting Officer will notify the Contractor of the status of the VECP within 45 calendar days after the contracting office receives it. If additional time is required, the Contracting Officer will notify the Contractor within the 45-day period and provide the reason for the delay and the expected date of the decision. The Government will process VECP's expeditiously; however, it will not be liable for any delay in acting upon a VECP.

(2) If the VECP is not accepted, the Contracting Officer will notify the Contractor in writing, explaining the reasons for rejection. The Contractor may withdraw any VECP, in whole or in part, at any time before it is accepted by the Government. The Contracting Officer may require that the Contractor provide written notification before undertaking significant expenditures for VECP effort.

(3) Any VECP may be accepted, in whole or in part, by the Contracting Officer's award of a modification to this contract citing this clause. The Contracting Officer may accept the VECP, even though an agreement on price reduction has not been reached, by issuing the Contractor a notice to proceed with the change. Until a notice to proceed is issued or a contract modification applied a VECP to this contract, the Contractor shall perform in accordance with the existing contract. The decision to accept or reject all or part of any VECP is a unilateral decision made solely at the discretion of the Contracting Officer.

(f) Sharing.

(1) Rates. The Government's share of savings is determined by subtracting Government costs from instant contract savings and multiplying the result by

(i) 45 percent for fixed-price contracts or

(ii) 75 percent for cost-reimbursement contracts.

(2) Payment. Payment of any share due the Contractor for use of a VECP on this contract shall be authorized by a modification to this contract to--

(i) Accept the VECP;

(ii) Reduce the contract price or estimated cost by the amount of instant contract savings; and

(iii) Provide the Contractor's share of savings by adding the amount calculated to the contract price or fee.

(g) Deleted.

(h) Subcontracts. The Contractor shall include an appropriate value engineering clause in any subcontract of $50,000 or more and may include one in subcontracts of lesser value. In computing any adjustment in this contract's price under paragraph (f) of this clause, the Contractor's allowable development and implementation costs clearly resulting from a VECP accepted by the Government under this contract, but shall exclude any value engineering incentive payments to a subcontractor. The Contractor may choose any arrangement for subcontractor value engineering incentive payments; provided, that these payments shall not reduce the Government's share of the savings resulting from the VECP.

(i) Data. The Contractor may restrict the Government's right to use any part of a VECP or the supporting data by marking the following legend on the affected parts:

"These data, furnished under the Value Engineering--Construction clause of contract - _____, shall not be disclosed outside the Government or duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate a value engineering change proposal submitted under the clause. This restriction does not limit the Government's right to use information contained in these data if it has been obtained or is otherwise available from the Contractor or from another source without limitations."

If a VECP is accepted, the Contractor hereby grants the Government unlimited rights in the VECP and supporting data, except that, with respect to data qualifying and submitted as limited rights technical data, the Government shall have the rights specified in the contract modification implementing the VECP and shall appropriately mark the data. (The terms "unlimited rights" and "limited rights" are defined in Part 27 of the Federal Acquisition Regulation.)

(End of Clause)

137. *FAR 52.249-2 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (MAY 2004) ALTERNATE I (SEP 1996) [For Contracts Over $100,000]

(a) The Government may terminate performance of work under this contract in whole or, from time to time, in part if the Contracting Officer determines that a termination is in the Government's interest. The Contracting Officer shall terminate by delivering to the Contractor a Notice of Termination specifying the extent of termination and the effective date.

(b) After receipt of a Notice of Termination, and except as directed by the Contracting Officer, the Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due under this clause:

(1) Stop work as specified in the notice.

(2) Place no further subcontracts or orders (referred to as subcontracts in this clause) for materials, services, or facilities, except as necessary to complete the continued portion of the contract.

(3) Terminate all subcontracts to the extent they relate to the work terminated.

(4) Assign to the Government, as directed by the Contracting Officer, all right, title, and interest of the Contractor under the subcontracts terminated, in which case the Government shall have the right to settle or to pay any termination settlement proposal arising out of those terminations.

(5) With approval or ratification to the extent required by the Contracting Officer, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts; the approval or ratification will be final for purposes of this clause.

(6) As directed by the Contracting Officer, transfer title and deliver to the Government

(i) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced or acquired for the work terminated, and

(ii) the completed or partially completed plans, drawings, information, and other property that, if the contract had been completed, would be required to be furnished to the Government.

(7) Complete performance of the work not terminated.

(8) Take any action that may be necessary, or that the Contracting Officer may direct, for the protection and preservation of the property related to this contract that is in the possession of the Contractor and in which the Government has or may acquire an interest.

(9) Use its best efforts to sell, as directed or authorized by the Contracting Officer, any property of the types referred to in subparagraph (b) (6) of this clause; provided, however, that the Contractor

(i) is not required to extend credit to any purchaser and

(ii) may acquire the property under the conditions prescribed by, and at prices approved by, the Contracting Officer. The proceeds of any transfer or disposition will be applied to reduce any payments to be made by the Government under this contract, credited to the price or cost of the work, or paid in any other manner directed by the Contracting Officer.

(c) The Contractor shall submit complete termination inventory schedules no later than 120 days from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 120-day period.

(d) After expiration of the plant clearance period as defined in Subpart 49.001 of the Federal Acquisition Regulation, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of termination inventory not previously disposed of, excluding items authorized for disposition by the Contracting Officer. The Contractor may request the Government to remove those items or enter into an agreement for their storage. Within 15 days, the Government will accept title to those items and remove them or enter into a storage agreement. The Contracting Officer may verify the list upon removal of the items, or if stored, within 45 days from submission of the list, and shall correct the list, as necessary, before final settlement.

(e) After termination, the Contractor shall submit a final termination settlement proposal to the Contracting Officer in the form and with the certification prescribed by the Contracting Officer. The Contractor shall submit the proposal promptly, but no later than 1 year from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 1 year period. However, if the Contracting Officer determines that the facts justify it, a termination settlement proposal may be received and acted on after 1 year or any extension. If the Contractor fails to submit the proposal within the time allowed, the Contracting Officer may determine, on the basis of information available, the amount, if any, due the Contractor because of the termination and shall pay the amount determined.

(f) Subject to paragraph (e) of this clause, the Contractor and the Contracting Officer may agree upon the whole or any part of the amount to be paid because of the termination. The amount may include a reasonable allowance for profit on work done. However, the agreed amount, whether under this paragraph (f) or paragraph (g) of this clause, exclusive of costs shown in subparagraph (g)(3) of this clause, may not exceed the total contract price as reduced by (1) the amount of payments previously made and (2) the contract price of work not terminated. The contract shall be amended, and the Contractor paid the agreed amount. Paragraph (f) of this clause shall not limit, restrict, or affect the amount that may be agreed upon to be paid under this paragraph.

(g) If the Contractor and the Contracting Officer fail to agree on the whole amount to be paid the Contractor because of the termination of work, the Contracting Officer shall pay the Contractor the amounts determined as follows, but without duplication of any amounts agreed upon under paragraph (f) of this clause:

(1) For contract work performed before the effective date of the termination, the total (without duplication of any items) of--

(i) The cost of this work;

(ii) The cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the contract if not included in subdivision (g)(1)(i) of this clause; and

(iii) A sum, as profit on subdivision (g)(1)(i) of this clause, determined by the Contracting Officer under 49.202 of the Federal Acquisition Regulation, in effect on the date of this contract, to be fair and reasonable; however, if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, the Contracting Officer shall allow no profit under this subdivision (iii) and shall reduce the settlement to reflect the indicated rate of loss.

(2) The reasonable costs of settlement of the work terminated, including--

(i) Accounting, legal, clerical, and other expenses reasonably necessary for the preparation of termination settlement proposals and supporting data;

(ii) The termination and settlement of subcontracts (excluding the amounts of such settlements); and

(iii) Storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

(h) Except for normal spoilage, and except to the extent that the Government expressly assumed the risk of loss, the Contracting Officer shall exclude from the amounts payable to the Contractor under paragraph (g) of this clause, the fair value, as determined by the Contracting Officer, of property that is destroyed, lost, stolen, or damaged so as to become undeliverable to the Government or to a buyer.

(i) The cost principles and procedures of Part 31 of the Federal Acquisition Regulation, in effect on the date of this contract, shall govern all costs claimed, agreed to, or determined under this clause.

(j) The Contractor shall have the right of appeal, under the Disputes clause, from any determination made by the Contracting Officer under paragraph (e), (g), or (l) of this clause, except that if the Contractor failed to submit the termination settlement proposal within the time provided in paragraph (e) or (l), respectively, and failed to request a time extension, there is no right of appeal.

(k) In arriving at the amount due the Contractor under this clause, there shall be deducted--

(1) All unliquidated advance or other payments to the Contractor under the terminated portion of this contract;

(2) Any claim which the Government has against the Contractor under this contract; and

(3) The agreed price for, or the proceeds of sale of, materials, supplies, or other things acquired by the Contractor or sold under the provisions of this clause and not recovered by or credited to the Government.

(l) If the termination is partial, the Contractor may file a proposal with the Contracting Officer for an equitable adjustment of the price(s) of the continued portion of the contract. The Contracting Officer shall make any equitable adjustment agreed upon. Any proposal by the Contractor for an equitable adjustment under this clause shall be requested within 90 days from the effective date of termination unless extended in writing by the Contracting Officer.

(m) (1) The Government may, under the terms and conditions it prescribes, make partial payments and payments against costs incurred by the Contractor for the terminated portion of the contract, if the Contracting Officer believes the total of these payments will not exceed the amount to which the Contractor will be entitled.

(2) If the total payments exceed the amount finally determined to be due, the Contractor shall repay the excess to the Government upon demand, together with interest computed at the rate established by the Secretary of the Treasury under 50 U.S.C. App. 1215(b)(2). Interest shall be computed for the period from the date the excess payment is received by the Contractor to the date the excess is repaid. Interest shall not be charged on any excess payment due to a reduction in the Contractor's termination settlement proposal because of retention or other disposition of termination inventory until 10 days after the date of the retention or disposition, or a later date determined by the Contracting Officer because of the circumstances.

(n) Unless otherwise provided in this contract or by statute, the Contractor shall maintain all records and documents relating to the terminated portion of this contract for 3 years after final settlement. This includes all books and other evidence bearing on the Contractor's costs and expenses under this contract. The Contractor shall make these records and documents available to the Government, at the Contractor's office, at all reasonable times, without any direct charge. If approved by the Contracting Officer, photographs, microphotographs, or other authentic reproductions may be maintained instead of original records and documents.

138. *FAR 52.249-10 DEFAULT (FIXED-PRICE CONSTRUCTION) (APR 1984)

(a) If the Contractor refuses or fails to prosecute the work or any separable part, with the diligence that will insure its completion within the time specified in this contract including any extension, or fails to complete the work within this time, the Government may, by written notice to the Contractor, terminate the right to proceed with the work (or the separable part of the work) that has been delayed. In this event, the Government may take over the work and complete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any

damage to the Government resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the Government in completing the work.

(b) The Contractor's right to proceed shall not be terminated nor the Contractor charged with damages under this clause, if-

(1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include

(i) acts of God or of the public enemy,

(ii) acts of the Government in either its sovereign or contractual capacity,

(iii) acts of another Contractor in the performance of a contract with the Government,

(iv) fires,

(v) floods,

(vi) epidemics,

(vii) quarantine restrictions,

(viii) strikes,

(ix) freight embargoes,

(x) unusually severe weather, or

(xi) delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and

(2) The Contractor, within 10 days from the beginning of any delay (unless extended by the Contracting Officer), notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, the time for completing the work shall be extended. The findings of the Contracting Officer shall be final and conclusive on the parties, but subject to appeal under the Disputes clause.

(c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligation s of the parties will be the same as if the termination had been issued for the convenience of the Government.

(d) The rights and remedies of the Government in this clause are in addition to any other rights and remedies provided by law or under this contract.

139. ENVIRONMENTAL LITIGATION (1974 NOV OCE)

(a) If the performance of all or any part of the work is suspended, delayed, or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation, as defined below, the Contracting Officer, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the Contractor or a Subcontractor at any tier not required by the terms of this contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a Subcontractor at any tier other than as required by the terms of this contract, such suspension, delay, or interruption shall be considered as if ordered by the Contracting Officer in the administration of this contract under the terms of the "Suspension of Work" clause of this contract. The period of such suspension, delay, or interruption shall be considered unreasonable, and an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) as provided in that clause, subject to all the provisions thereof.

(b) The term "environmental litigation," as used herein, means a lawsuit alleging that the work will have an adverse effect on the environment or that the Government has not duly considered, either substantively or procedurally, the effect of the work on the environment.

140. EFARS 52.249-5000 BASIS FOR SETTLEMENT OF PROPOSALS

Actual costs will be used to determine equipment cost for a settlement proposal submitted on the total cost basis under FAR 49.206-2(b). In evaluating a termination settlement proposal using the total cost basis, the following principles will be applied to determine allowable equipment costs:

(1) Actual costs for each piece of equipment, or groups of similar serial or series equipment, need not be available in the contractor's accounting records to determine total actual equipment costs.

(2) If equipment costs have been allocated to a contract using predetermined rates, those charges will be adjusted to actual costs.

(3) Recorded job costs adjusted for unallowable and unallocable expenses will be used to determine equipment operating expenses.

(4) Ownership costs (depreciation) will be determined using the contractor's depreciation schedule (subject to the provisions of FAR 31.205-11).

(5) License, taxes, storage and insurance costs are normally recovered as an indirect expense and unless the contractor charges these costs directly to contracts, they will be recovered through the indirect expense rate.

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SECTION 00800

SPECIAL CONTRACT REQUIREMENTS
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PART 1 GENERAL

Attachments:

Appendix A-Contract Document Distribution List
Appendix B - Buckley Confined Spaces Guide/AFOSH 91-25
General Wage Decision Nos. CO030002 and CO030012
AF Form 103 Base Civil Engineering Work Clearance Request
Contractor Employee Verification List

1.1 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall be required to (a) commence work under this contract within ten (10) calendar days after the date of receipt by him of Notice to Proceed, (b) prosecute said work diligently, and (c) complete the entire work ready for use not later than the number of calendar days proposed by the Contractor and entered into Item 11 of SF 1442 (Page 00010-1)after Notice to Proceed (NTP). This duration may not exceed 510 calendar days. The time stated for completion of the project shall include final cleanup of the premises. (FAR 52.211-10)

1.1.1 Start Work

Evidence that the Contractor has started procurement of materials, preparation and submission of shop drawings, preparation of subcontracts, and other preparatory work will satisfy the requirement that work commence within ten (10) calendar days after receipt of Notice to Proceed. Therefore, work need not be commenced at the construction site within ten (10) calendar days.

1.2 LIQUIDATED DAMAGES-CONSTRUCTION (SEPT 2000)

(a) If the Contractor fails to complete the work within the time inserted in Item 11 on page 00010-1 of Standard Form 1442, the Contractor shall pay liquidated damages to the Government in the amount of $1,600 for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause. (FAR 52.211-12)

1.3 EXCEPTION TO COMPLETION TIME AND LIQUIDATED DAMAGES

In case the Contracting Officer determines that seeding, sodding, and/or planting and/or the specified maintenance thereof is not feasible during the construction period, such work will be excepted from the completion time and liquidated damages. This work shall be accomplished during the first seeding, sodding, and/or planting period and the specified

maintenance period following the completion date.

1.4 PHASING/COORDINATION/WORK RESTRICTIONS

The following phasing/coordination/work restrictions are necessary for the accomplishment of the work on this project. Note that other specification sections may have additional restrictions.

1.4.1 Construction of Optional Parking Lot

If the Optional Parking Lot is awarded, the contractor shall complete all work on this parking lot within 160 days of NTP or award of that option, whichever results in the longest time frame. The Chapel project, located immediately adjacent to this parking lot work, will be under construction concurrently with this parking lot. The contractor will limit the area of his work to the minimum site necessary to accomplish the construction of this lot, and to avoid disruption of the Chapel contractor's work activities. Coordination with the Chapel contractor will be necessary to have that contractor install electrical conduits for the parking lot lights (parking lot lights and electrical conduits below the parking lot are a part of the Chapel contract).

1.4.2 Utility Outages

Installation of project utilities may necessitate outages to existing base utility systems and/or service to specific buildings. The contractor shall insure that both the number and the duration of all outages are minimized, and that all steps are taken in scheduling these outages to minimize the impact to the Base. The contractor shall provide at least 15 days written notice to the Base, through the COR prior to any outage. Notification of building tenants of an upcoming outage will be done by the Base after receipt of written notification. The government reserves the right to disapprove the scheduled date for the outage within 24 hours of the actual outage, in order to maintain operations of critical systems or facilities. No outages to the natual gas supply line of any facility shall be interrupted for more than four hours between 1 November and 15 March.

1.4.3 Road Closures for New Work.

Both Eldora Street and A-Basin Avenue shall remain open during construction. Specific items of work, such as parking lot and access road installation may necessitate the temporary partial closure of these streets. These temporary partial closures shall allow passage of traffic on these streets and the temporary partial closure shall be limited to 14 calendar days.

The Contractor shall be responsible for providing all temporary construction signage and barricades in accordance with the Manual on Uniform Traffic Control Devices.

1.4.4 Confined Space Entry

All manholes on base are considered to be permit-required confined spaces. Contractor shall adhere to the Buckley AFB Confined Spaces Guide and AFOSH 91-25, which are included as Appendix C to this Section of Specifications. Upon issuance of NTP, and prior to entering any manhole, the contractor shall prepare and submit for approval a Master Entry Plan (MEP) as discussed in the Buckley Confined Spaces Guide and the AFOSH. Approval of the MEP will take approximately 28 calendar days. In addition, a Confined

Space Entry Permit must be applied for and obtained prior to entry into any manhole or confined space. Provisions of the MEP shall be followed during all entries into manholes. The contractor shall be responsible for furnishing his employees all monitoring and safety equipment mandated by the referenced documents. In addition, the contractors entering confined spaces must be Self-Rescue Qualified. Prior to allowing workers entry, a briefing shall be conducted with Base Personnel to identify emergency and safety procedures, potential hazards present, and other pertinent information. If welding, cutting, brazing, soldering, or painting are to be performed in any manhole, an AF Form 592 - Welding Permit, must also be obtained. The contractor is encouraged to contact 460 ABW/SE, through the COR, prior to the compilation of the MEP and the permit applications discussed herein.

1.5 MISSION DELAY DAYS

The Contractor shall anticipate a work delay of up to twelve (12) days during the contract period due to Using Service operations. The Contractor will be notified one week in advance of these interruptions. This time is included in the overall completion time stated. The Contractor shall anticipate at least one of these mission delay days will occur without advance notification.

1.6 CONTRACT DRAWINGS AND SPECIFICATIONS

1.6.1 SETS FURNISHED

The contractor shall be responsible for making copies of specifications including amendments. The bid drawings as amended shall be utilized in the performance of the work until a CD containing the contract drawings (i.e., bid drawings that have been posted with all amendment changes) are mailed to the Contractor. See paragraph below for contract drawing reproduction and distribution requirements. The work shall conform to the contract drawings, set out in the drawing index, all of which form a part of these specifications. The work shall also conform to the standard details bound or referenced herein.

1.6.2 DRAWING REPRODUCTION AND DISTRIBUTION

a. Contract Drawings

The Contractor shall reproduce multiple legible hard copy sets of half-size English-size sets of contract drawings, for himself, his subcontractors, and the Government entities listed in Appendix A, from Government provided CD-ROM containing read-only CAL file drawings. Within 14 calendar days of Notice to Proceed, the successful contractor will be furnished with a CD containing read-only CALS files. Within 14 calendar days after receiving this CD-ROM, the Contractor shall provide legible hard copy half-size drawing sets to the addressees contained in the Contract Document Distribution List found in Appendix A to this specification. The Government will process no progress payments prior to receipt of the legible contract drawings. After receipt and distribution of the legible hard copy drawing sets, the Government will review sets for acceptability and, if acceptable, will provide the Contractor with a CD-ROM containing editable CAD file drawings (format defined in Section 01040 AS-BUILT DRAWINGS). The Contractor shall prepare as-built drawings as defined in Section 01040 AS-BUILT DRAWINGS using this CD.

b. Drawings Issued by Contract Modication

Drawings requiring reissue or added by contract modification will be furnished to the Contractor on a Government provided CD-ROM containing an electronic version of read-only CAL file drawings. The Contractor shall provide legible hard copy half-size sets of drawings issued by contract modification to the addressees contained in the Contract Document Distribution List in Appendix A to this specification section. After receipt and distribution of the legible hard copy sets drawings issued by contract modification, the Government will review sets for acceptability and, if acceptable, will provide the Contractor with a CD-ROM containing editable CAD file drawings. The Government intends to expedite delivery of the CD containing the modification drawings and the review of the hard copy modification drawing sets furnished by the Contractor. The Contractor shall expedite delivery of legible hard copy sets of drawings issued by modification. Progress payments for modification work may be withheld by the Government from the Contractor for failing to deliver acceptable hard sets of drawings issued by modification. As-built drawing development shall reflect the drawings added or revised by contract modification.

1.6.3 NOTIFICATION OF DISCREPANCIES

The Contractor shall check all CD-ROM drawing files furnished him immediately upon their receipt and shall promptly notify the Contracting Officer of any discrepancies. Dimensions marked on drawings shall be followed in lieu of scale measurements. Enlarged plans and details shall govern where the same work is shown at smaller scales. All scales shown are based on a standard drawing size of 28" x 40" . If any other size drawings are furnished or plotted the contractor shall adjust the scales accordingly. The Contractor shall also advise his sub-contractors of the above. The Contractor shall compare all drawings and verify the figures before laying out the work and will be responsible for any errors which might have been avoided thereby.

1.6.4 OMISSIONS

Omissions from the drawings or specifications or the misdescription of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work but they shall be performed as if fully and correctly set forth and described in the drawings and specifications.

1.7 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Equipment Room Drawings; G-AO.

1.8 PHYSICAL DATA (APR 1984)

Data and information furnished or referred to below is for the Contractors' information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the

Contractor.

a. The indications of physical conditions on the drawings and in the specifications are the result of site investigations by surveys and core borings. The data shown graphically and by symbol for each respective boring represents the actual geologic features observed and logged at the location given on the drawings. While the borings are representative of subsurface conditions at their respective locations and for their respective vertical reaches, local minor variations characteristic of the subsurface materials of this region could occur.

b. Weather conditions shall have been investigated by the Contractor to satisfy himself as to the hazards likely to arise therefrom. Complete weather records and reports may be obtained from the local U.S. Weather Bureau.

c. Transportation facilities shall have been investigated by the Contractor to satisfy himself as to the existence of access highways and railroad facilities. (FAR 52.236-4)

1.9 CONCURRENT CONSTRUCTION

Other construction work on Base, under concurrent contracts will be in progress simultaneously with work under this contract. This may include the re-construction of A-Basin Avenue and Aspen Drive - if A-Basin or Aspen is under construction at the time this project commences work, the contractor shall accommodate the concurrent road work by utilization of different access routes to the site and delaying his work on the parking lot access road connections to A-Basin. In addition, the Chapel and the TLF/VQ projects will be under construction concurrently, located just south of the project site, across A-Basin Avenue. The Contractor shall cooperate with others as necessary in the interest of timely completion of all work. In the event of interference, the Contracting Officer shall be notified immediately for resolution and his decision shall be final.

1.10 PAYMENT

1.10.1 PROMPT PAYMENT ACT

Pay requests authorized in CONTRACT CLAUSES clause: "Payments Under Fixed-Price Construction Contracts", will be paid pursuant to the clause, "Prompt Payment for Construction Contracts". Pay requests will be submitted on ENG Form 93 and 93a, "Payment Estimate-Contract Performance" and "Continuation". All information and substantiation required by the identified contract clauses will be submitted with the ENG Form 93, and the required certification will be included on the last page of the ENG Form 93a, signed by an authorized contractor official and dated when signed. The designated billing office is the Office of the Area Engineer.

1.10.2 PAYMENTS FOR MODIFICATIONS

Payments may be made for cost bearing change orders within the scope of the contract only to the extent funds are authorized in the order on a two-part modification. Contractor pricing proposed must be submitted at the earliest possible time after the change order is issued, or at a specific time as directed by the Contracting Officer. At the discretion of the Contracting Officer, any and all payments may be withheld on the modification until the Contractor has submitted a qualifying price

proposal, in as much detail as required by the Contracting Officer, and the final price has been agreed.

1.10.3 PAYMENT FOR MATERIALS DELIVERED OFFSITE (MAR 1995)

a. Pursuant to FAR clause 52.232-5, Payments Under Fixed Priced Construction Contracts, materials delivered to the contractor at locations other than the site of the work may be taken into consideration in making payments if included in payment estimates and if all the conditions of the General Provisions are fulfilled. Payment for items delivered to locations other than the work site will be limited to: (1) materials required by the technical provisions; or (2) materials that have been fabricated to the point where they are identifiable to an item of work required under this contract.

b. Such payment will be made only after receipt of paid or receipted invoices or invoices with canceled check showing title to the items in the prime contractor and including the value of material and labor incorporated into the item. Payment for materials delivered off-site includes petroleum products. (EFAR 52.232-5000)

1.11 AVAILABILITY OF UTILITY SERVICES

The Contractor shall, at his own expense, make all temporary connections and install distribution lines and meters for power, water, gas and other utilities for project trailers and construction operations. The Contractor shall furnish to the Contracting Officer a complete system layout drawing showing type of materials to be used and method of installation for all temporary utility lines. Meters shall be installed by the Contractor to determine the amount of water, gas, and electricity used by him, and such utilities will be paid for by or charged to the Contractor. All temporary lines shall be maintained by the Contractor in a workmanlike manner satisfactory to the Contracting Officer and shall be removed by the Contractor in like manner prior to final acceptance of the construction. Normal quantities of electricity and water used to make final tests of completely installed systems will be furnished by the Government. The Contractor shall make arrangements with the local phone company for phone service and pay all costs for the service to the local company.

1.12 UTILITY SERVICE INTERRUPTIONS

The Contractor shall submit written notification not less than 15 calendar days in advance of each interruption of each utility and communication service to or within existing buildings and facilities being used by others. No single outage will exceed 4 hours unless approved in writing. The time and duration of all outages will be coordinated and approved with the Using Agency by the Contracting Officer.

1.13 DIGGING PERMITS AND ROAD CLOSINGS

The Contractor shall be responsible for securing digging permits. The Contractor will be provided a blank AF Form 103 and shall be responsible for signatures and coordination with communications, fire department, plumbing shop, electrical shop, grounds shop, environmental, safety, security police, base operations and any affected public utility. Prior to requesting the digging permit, the Contractor shall locate and flag all existing utilities in the vicinity of the areas encompassed by the digging permit application. Work on or near roadways shall be flagged in accordance with the safety requirements in Safety and Health Requirements

Manual EM 385-1-1, which forms a part of these specifications. Roads shall not be closed at any time for utility or parking lot access road work. All utilities crossing beneath any paved road, driveway, or parking lot shall be installed via boring and jacking. This provision includes jacking and boring casing pipes, as necessary.

1.14 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

a. This clause specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the contract clause entitled "Default: (Fixed-Price Construction)." In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

(1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the contractor.

b. The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
(06)	(06)	(05)	(05)	(05)	(04)	(04)	(04)	(03)	(04)	(05)	(06)

c. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the contractor's scheduled work day. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph b. above, the contracting officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the contract clause entitled "Default (Fixed Price Construction)". (ER 415-1-15)

1.15 INSURANCE REQUIRED

In accordance with CONTRACT CLAUSES clause: "Insurance Work on a Government Installation," the Contractor shall procure the following minimum insurance:

Type Amount

Workmen's Compensation and Employer's Liability Insurance	$100,000
General Liability Insurance	$500,000 per occurrence
Automobile Liability Insurance	
Bodily injury	$200,000 per person and $500,000 per occurrence
Property damage	$ 20,000 per occurrence

(Coverages per FAR 28.307-2)

1.16 SECURITY REQUIREMENTS

1.16.1 Contractor's Employee Identification

The Contractor shall be responsible for furnishing to each employee and for requiring each employee engaged on the work to display such identification as may be approved and directed by the Contracting Officer. All prescribed identification shall immediately be delivered to the Contracting Officer, for cancellation upon release of any employees. When the contract involves work in restricted security areas, only employees who are U.S. citizens will be permitted to enter. Proof of U.S. citizenship is required prior to entry. When required by the Contracting Officer, the Contractor shall obtain and submit fingerprints of all persons employed or to be employed on the project. (Based on FAR 52.204-2)

1.16.2 Base Access and Security

a. Each Contractor and Contractor employee to work on the job at Buckley must obtain a vehicle pass to enter the base. The pass will be obtained the first day of work at Buckley, or not later than the next working day. To obtain the vehicle pass, the vehicle operator must have in his possession a current, valid driver's license, current vehicle registration, and current proof of insurance. Procedures for obtaining a base pass will be identified at the Pre-Construction Meeting. Expired/unregistered vehicles will not be allowed on the base. Employees who are terminated from employment will surrender any and all identification media and vehicle passes to their immediate supervisor, who will in turn surrender same to the Pass and ID Office, and the supervisor will immediately escort the terminated employee off base, and notify Base Police of the termination. Access to Buckley AFB shall be through the Mississippi Avenue Gate. The Contractor shall provided the Buckley AFB Base Security Police a copy of a completed "Contractor Employee Verification List" Attachment, with is to include the names of all subcontractors and suppliers, and the names and social security numbers of all employees requiring access to the Base. The list shall be revised in its entirety and a new copy provided to the Buckley AFB Security Police as persons/companies are added and/or deleted.

b. All drivers on Buckley will have in their possession a valid driver's license, valid vehicle registration, and proof of vehicle insurance while operating any vehicle. If vehicle is registered to someone other than the operator, the operator must provide a notarized letter from the registered owner authorizing the operator permission to operate the vehicle.

c. Contract Superintendent must notify Base Police through the Contracting Office prior to any work to be performed on non-scheduled hours/days (evenings, weekends, holidays). Any personnel working on non-scheduled hours/days must check in with Base Police, prior to and at the completion

of the work.

d. All equipment and materials are the responsibility of the Contractor. Make sure that all equipment and materials are properly secured at the end of the work day. Any work area found by Base Police to be unsecured will be checked for intruders and the responsible Contract Superintendent will be called in to secure the areas/equipment.

e. If any roadway is to be blocked for any reason, the Contractor must notify, through the Contracting Office, the Base Police of the blockage, prior to the blockage, and must insure that proper signs are installed to divert traffic around the affected area. As much lead time notification as possible is appreciated for proper coordination, and notification of other activities on base.

f. Contractors, Subcontractors and all personnel who report for work, and do not know the location of the job site, will be held at the main gate to await escort service from the Construction Superintendent.

g. Base speed limits are strictly enforced with the use of radar equipment. The base speed limit is 30 MPH, unless otherwise posted. The speed limit through the gates is 20 MPH. Motorcycle operator/riders must wear protective headgear (helmets) while riding on base. Mandatory seatbelt laws are in effect on base. Seatbelts must be fastened prior to entering the base. All motor vehicle traffic must enter the base via the Mississippi Avenue gate.

h. No privately owned weapons or contraband (drugs, etc.) are permitted on any military installation, at any time. Violators will be prosecuted through the Federal Magistrates Court in Denver. Cameras are also considered to be contraband on this installation.

i. Buckley AFB is considered to be a closed facility. No unauthorized tours or visitors will be allowed on the installation.

j. Base Security Police emergency number is 340-9777. This number provides emergency police, fire, and ambulance service. For normal business, 24 hours a day, 7 days/week, call 340-9930/9931.

1.16.3 Contractor Employees Requiring Access to Automated Information Systems (AIS)

All Contractor (and subcontractor) employees (U.S. citizens and Non- U.S. citizens) working under this contract (to include grants, cooperative agreements and task orders) who require access to Automated Information Systems (AIS), (stand alone computers, network computers/systems, e-mail) shall, at a minimum, be designated into an ADP-III position (non-sensitive) in accordance with DoD 5220-22-R, Industrial Security Regulation (http://www.deskbook.osd.mil/htmlfiles/DBY_dod-7-Careers.asp).

The investigative requirements for an ADP-III position are a favorable National Agency Check (NAC), SF-85P, Public Trust Position.
SF-85P is available at: http://www.gsa.gov/Portal/home.jsp

Under "Key Information", click on "Federal Forms",
Click on "U.S. Government Forms (GSA, Standard and Optional)"
Click on "Standard (SF) Forms"
Click on "SF 85P Questionnaire for Public Trust Positions"
SF 85P is available in either Screen-Fillable FormNet Version or Adobe

Acrobat version.

Proof of a favorable NAC shall be submitted to USACE, Omaha District Security Officer, ATTN: CENWO-SL, 106 S. 15th St, Omaha, NE 68102-1618, within three (3) working days after award of any contract or task order, and shall be submitted prior to the individual being permitted access to an AIS.

a. Contractors who have a commercial or government entity (CAGE) Code and Facility Security Clearance should submit forms through their Facility Security Office, who shall forward results of the NAC to the Omaha District Security Officer (address above).

b. For those contractors who do not have a CAGE Code or Facility Security Clearance, the SF 85-P and 2 copies of the FD-258 (Fingerprint Cards) shall be completed and submitted to the Omaha District Security Officer (address above.) These must be mailed or hand-delivered, as original signatures are required. Fingerprint cards are available upon request and may be taken to any local law enforcement center for completion. For those in the Omaha, Nebraska area, fingerprint cards may be completed by contacting the Omaha District Human Resources Office, (402) 221-4072.

In accordance with Engineering Regulation, ER 380-1-18 (http://www.usace.army.mil/inet/usace-docs/eng-regs/er.htm), Section 4, foreign nationals who work on Corps of Engineers' contracts or task orders shall be approved by the HQUSACE Foreign Disclosure Officer or higher before beginning work on the contract/task order. This regulation includes subcontractor employees. (NOTE: exceptions to the above requirement include foreign nationals who perform janitorial and/or ground maintenance services.) The Contractor shall submit to the Omaha District Contracting Office, ATTN: (CENWO-CT) the names of all foreign nationals proposed for performance under this contract/task order, along with documentation to verify that he/she was legally admitted into the United States and has authority to work and/or go to school in the US. Such documentation may include a US passport, Certificate of US citizenship (INS Form N-560 or N-561), Certificate of Naturalization (INS Form N-550 or N-570), foreign passport with I-551 stamp or attached INS Form I-94 indicating employment authorization, Alien Registration Receipt Card with photograph (INS Form I-151 or I-551), Temporary Resident Card (INS Form I-688), Employment Authorization Card (INS Form I-688A), Reentry Permit (INS Form I-327), Refugee Travel Document (INS Form I-571), Employment Authorization Document issued by the INS which contains a photograph (INS Form I-688B). INS forms are available at http://www.immigration.gov/graphics/formsfee/index.htm.

Compliance with this provision is mandatory (only if AIS access is required). Offeror should check the appropriate box below and return with offer or quote to Contracting Office.

[ ] HAVE FAVORABLE SF-85P(s)*
[ ] SF85-P(s) TO BE INITIATED UPON AWARD
[ ] SF85-P(s) PAPERWORK IN PROGRESS
[ ] DO NOT INTEND TO COMPLY

*Must be accomplished for each employee who will be accessing Government AIS under this action.

(End of Provision)(PIL 2003-06, 19 Feb 03)

1.17 CONTRACTOR QUALITY CONTROL (CQC)

See Section 01451A Contractor Quality Control.

1.18 NONDOMESTIC CONSTRUCTION MATERIALS

The List of nondomestic construction materials or their components included in the list set forth in paragraph 25.104 of the Federal Acquisition Regulation does not apply to the requirements of the contract clause entitled "Buy American Act Construction Materials".

1.19 NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (SEP 1990)

Any contract awarded as a result of this solicitation will be a DO rated order certified for national defense use under the Defense Priorities and Allocations System (DPAS) (15 CFR 700), and the Contractor will be required to follow all of the requirements of this regulation. (FAR 52.211-14)

1.20 DAILY WORK SCHEDULES AND WEEKLY COORDINATION MEETINGS

In order to closely coordinate work under this contract, the Contractor shall attend a weekly coordinattion meeting with the Contracting Officer and the Using Service. The Contractor shall prepare a written agenda prior to the meeting and meeting minutes within five days after this meeting. At these meetings, the Contractor shall submit for coordination and approval, his proposed daily work schedule for the next two week period. The Contractor shall provide a copy of modifications (MODs), Serial Letters, Requests for Information (RFIs)and any other information that is needed in the minutes of the meeting. Work plan concerns or revisions, required temporary utility services, time and duration of utility interruptions, and protection of adjoining areas shall be included with the Contractor's proposed 2-week work schedule. At this meeting, the Contractor shall also submit his schedule of proposed dates and times of all preparatory inspections to be performed during the next 2 weeks. The items of work listed on the proposed 2-week schedule are to be keyed to the NAS by activity number and description for each activity anticipated to be performed during the next 2-week period. Coordination action by the Contracting Officer relative to these schedules will be accomplished during these weekly meetings. Daily reports shall be completed and given to the Contracting Officer or Representative within 24 hours of work

1.21 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (MAR 1995)

a. This statement shall become operative only for negotiated contracts where cost or pricing data is requested, and for modifications to sealed bid or negotiated contracts where cost or pricing data is requested. This clause does not apply to terminations. See 52.249-5000, Basis for settlement of proposals and FAR Part 49.

b. Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a Contractor or subcontractor at any tier shall be based on actual cost data for each piece of equipment or groups of similar serial and series for which the Government can determine both ownership and operating costs from the Contractor's accounting records. When both ownership and operating costs cannot be determined for any piece of equipment or groups of similar serial or series of equipment from the Contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP 1110-1-8, "Construction Equipment Ownership and Operating Expense

Schedule," Region V. Copies of each regional schedule may be obtained through the following internet site: http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep.htm. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the Contracting Officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be developed using the formula provided in the schedule. For forward pricing, the Schedule in effect at the time of negotiations shall apply. For retrospective pricing, the Schedule in effect at the time the work was performed shall apply.

c. Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d)(ii) and FAR 31.205-36. Rates for equipment rented from an organization under common control, lease-purchase arrangements, and sale-leaseback arrangements will be determined using the schedule, except that actual rates will be used for equipment leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees.

d. When actual equipment costs are proposed and the total amount of the pricing action exceeds the small purchase threshold, the contracting officer shall request the contractor to submit either certified cost or pricing data, or partial/limited data as appropriate. The data shall be submitted on Standard Form 1411, Contract Pricing Proposal Cover Sheet. (EFARS 52.231-5000)

1.22 AS-BUILT DRAWINGS

See SECTION 01040 - AS-BUILT DRAWINGS

1.23 SIGN

On commencement of work on this project, the Contractor shall furnish and erect a temporary sign in a location selected by the Contracting Officer near the contractor's trailer at the staging area. The Contractor shall maintain the sign in good condition through the project construction period. Upon completion of the project, the Contractor shall remove the sign from the premises. The project sign shall conform to to the requirements shown on the drawings. A decal of the "Engineer Castle" and the U. S. Air Force emblem will be furnished the Contractor upon request.

1.24 EQUIPMENT ROOM DRAWINGS

Prior to construction, the Contractor shall prepare and submit room plans for all mechanical, electrical, and communication rooms or similar areas. The plans shall be consolidated for all trades, shall be to scale, and shall show all pertinent structural features. In addition, other items such as doors, windows, and cabinets required for installation and which will affect the available space, will be shown. All mechanical and electrical equipment and accessories shall be shown to scale in plan and elevation and/or section in their installed positions. All duct work and piping shall be shown.

1.25 CONTRACTOR FURNISHED EQUIPMENT DATA

See Section 01200 Warranty of Construction for Contractor Furnished Equipment Data to be submitted as part of the Warranty Equipment Booklet.

1.26 GOVERNMENT QA REPRESENTATIVE'S FIELD OFFICE

A. The Contractor shall, within fifteen (15) days after receipt of Notice to Proceed, provide where directed, a temporary field office, furniture, and two inch deep gravel surfaced parking area for use of two Government on-site representative. Office and furniture shall be new or in "like new" condition.

B. The field office shall provide not less than 400 gross square feet of floor area in one unit. Installation of the office shall meet all local codes. Trailer shall be securely anchored to prevent movement during high wind.

C. Provide office with two, three-foot wide exterior doors, including hardware and OSHA approved platform and stairs leading to grade.

D. Enclose the entire perimeter of the office from the floor to the ground and finish to match exterior. Provide R7 insulation and seal tight to ground with a painted 19 mm (3/4 inch) exterior grade plywood skirt.

E. Exterior finishes shall be manufacturer's standards.

F. Provide floor, wall, and roof with not less than R5 insulation.

G. Interior finishes shall consist of resilient flooring, plywood paneling or painted wallboard on walls, and acoustical tile ceilings. Interior doors may be either painted or stained.

H. Interior shall be subdivided with full height partitions to provide one office, one toilet room (complete with connections to water and sewer), a 2 foot by 2 foot storage closet (approximately), and one conference room with sufficient space to accommodate 15 persons). Provide each space with three foot wide door with master keyed locks. Door keys shall be provided to the Government only.

I. Provide 2-1/2 feet wide by 3 feet high operable windows; two in each room except provide only one 2 foot high window in toilet room.

J. Provide sufficient fluorescent lighting in each room to deliver 70 foot-candles of light at desk top height without the aid of daylight. Provide at least one light switch in each room.

K. Provide one duplex receptacle in each wall of each room. If a wall is 10 feet long or more, provide two receptacles for each 10 feet, or portion thereof, of wall.

L. The Contractor shall provide the following:

1. Electricity, hot and cold water, and necessary utility services to include commercial telephone service in the office at no cost to the Government. The Government will pay costs for long distance calls.

2. All necessary piping, power circuits, electrical fixtures, lighting, and other items necessary to provide a habitable structure for the purpose intended.

3. Thermostatically controlled, centralized heating and air conditioning system designed to maintain the temperature between

70 and 80 degrees F.

4. One water closet, lavatory, mirror, toilet paper dispenser, paper towel dispenser, soap dispenser, and a towel bar, for the toilet room.

M. Contractor shall, for the duration of the contract, provide the following:

1. Clean and safe conditions in and around the field office and parking area.

2. Maintenance of gravel surfaced parking area in front of the trailer, to include daily snow and ice removal from the area in front of the trailer and access to the trailer (when necessary). The area in front of the trailer shall be reserved for Government use only. The parking area shall be large enough for four cars.

3. Maintenance of utility services. Utilities shall be connected and disconnected in accordance with the Buckley AFB policies, and EM385-1-1.

4. Daily janitorial services and supplies (toilet paper, soap, etc.).

5. Potable water, fuel (if needed for heating) and electric power for normal office uses, including lights, heating and air conditioning.

N. The Contractor shall provide the following new or "like" new reconditioned items to accommodate two government representatives:

QUANTITY REQUIRED	
2	Office desks, double pedestal.
1	Plan table (4' x 7') with stool.
1	Work table (folding 30" x 72")
2	Swivel chairs with arms
6	Conference chairs (armless & folding)
2	5-drawer file cabinets, legal size
2	Bookcases
2	Telephones
1	Answering Machine
1	Additional Telephone Outlet for a Fax Machine
1	Electric water cooler
2	Work tables (folding 30" x 48")

O. At the completion of all work, including the punch list, O&M Manuals, As-Built Drawings, the Government representative's field office and facilities, shall become the property of the Contractor and the Contractor shall remove same, including utility connections, from the site. The site shall be restored to original condition and finished in accordance with contract requirements.

P. The Contractor shall furnish floor plans for approval by the Government prior to furnishing the field office.

1.27 NOT USED

1.28 PERFORMANCE OF WORK BY CONTRACTOR (APR 1984)

The Contractor shall perform on the site, and with its own organization, work equivalent to at least twenty (20) percent of the total amount of work to be performed under the contract. This percentage may be reduced by a supplemental agreement to this contract if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the Government. (FAR 52.236-1)

1.29 PARTNERING

a. The Government intends to encourage the formation of a cohesive partnership with the Contractor. This partnership will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objective is effective contract performance in achieving completion within budget, on schedule and in accordance with plans and specifications. This partnership between the Contractor and the Government will be voluntary and its implementation will not be part of the contract requirements nor will it result in a change to contract price or terms.

b. It is anticipated that immediately after the preconstruction conference, the appropriate Contractor's key personnel and Government key personnel will attend a 2-3 hours informal team building workshop at the Resident Engineer's Office. Costs of the facilitator and facilities for the workshops will be shared equally by the participants.

1.30 PROFIT

a. Weighted guidelines method of determining profit shall be used on any equitable adjustment change order or modification issued under this contract. The profit factors shall be as follows:

Factor	Rate	Weight	Value
Degree of Risk	20	See Item	
Relative difficulty of work	15	b. below	
Size of Job	15		
Period of performance	15		
Contractor's investment	5		
Assistance by Government	5		
Subcontracting	25		
	100		

b. Based on the circumstances of each procurement action, each of the above factors shall be weighted from .03 to .12 as indicated below. The value shall be obtained by multiplying the rate by the weight. The value column when totalled indicates the fair and reasonable profit percentage under the circumstances of the particular procurement.

(1) Degree of Risk. Where the work involves no risk or the degree of risk is very small, the weighting should be .03; as the degree of risk increases, the weighting should be increased up to a maximum of .12. Lump sum items will have, generally, a higher weighted value than the unit price items for which quantities are provided. Other things to consider: the

portion of the work to be done by subcontractors, nature of work, where work is to be performed, reasonableness of negotiated costs, amount of labor included in costs, and whether the negotiation is before or after performance of work.

(2) Relative Difficulty of Work. If the work is most difficult and complex, the weighting should be .12 and should be proportionately reduced to .03 on the simplest of jobs. This factor is tied in to some extent with the degree of risk. Some things to consider: the nature of the work, by whom it is to be done, where, and what is the time schedule.

(3) Size of Job. All work not in excess of $100,000 shall be weighted at .12. Work estimated between $100,000 and $5,000,000 shall be proportionately weighted from .12 to .05.

(4) Periods of Performance. Jobs in excess of 24 months are to be weighted at .12. Jobs of lesser duration are to be proportionately weighted to a minimum of .03 for jobs not to exceed 30 days. No weight where additional time not required.

(5) Contractor's Investment. To be weighted from .03 to .12 on the basis of below average, average, and above average. Things to consider: amount of subcontracting, mobilization payment item, Government furnished property, equipment and facilities, and expediting assistance.

(6) Assistance by Government. To be weighted from .12 to .03 on the basis of average to above average. Things to consider: use of Government-owned property, equipment and facilities, and expediting assistance.

(7) Subcontracting. To be weighted inversely proportional to the amount of subcontracting. Where 80 percent or more of the work is to be subcontracted, the weighting is to be .03 and such weighting proportionately increased to .12 where all the work is performed by the Contractor's own forces.

1.31 LABOR CONDITIONS APPLICABLE TO TEMPORARY FACILITIES

It is the position of the Department of Defense that the Davis-Bacon Act, 40 U.S.C. 276a is applicable to temporary facilities such as batch plants, sandpits, rock quarries, and similar operations, located off the immediate site of the construction but set up exclusively to furnish required materials for a construction project on the site of the work. Clause "Payrolls and Basic Records" of the CONTRACT CLAUSES is applicable to such operations.

1.32 DRAWING SCALES

All scales shown are based on a standard drawing size of 28" x 40". If any other size drawings are furnished or plotted, the contractor shall adjust the scales accordingly. The Contractor shall also advise his sub-contractors of the above.

1.33 WAGE RATE APPLICATION

1.33.1 Building Schedule

Applicable to all work required within 5 feet outside the building lines.

1.33.2 Heavy Schedule

Applicable to all work beyond 5 feet outside the building.

1.34 (FAR 52.222-23) NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for Minority Participation for Each Trade	Goals for Female Participation for Each Trade
13.8	6.9

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs Office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the -

(1) Name, address, and telephone number of the subcontractor;

(2) Employer identification number of the subcontractor;

(3) Estimated dollar amount of the subcontract;

(4) Estimated starting and completion dates of the subcontract; and

(5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is Denver-Boulder SMSA-2080, which Arapahoe county is a part of.

1.35 FEDERAL HOLIDAYS

The following Federal legal holidays are observed by this installation:

New Year's Day	1 January
Martin Luther King's Birthday	Third Monday in January
President's Day	Third Monday in February
Memorial Day	Last Monday in May
Independence Day	4 July
Labor Day	First Monday in September
Columbus Day	Second Monday in October
Veterans Day	11 November
Thanksgiving Day	Fourth Thursday in November
Christmas Day	25 December

If a wage determination applies the number of holidays specified on it, it has priority over this clause.

1.36 BASE HOURS

Base operation hours are 6:00 a.m. to 5:00 p.m. daily (Monday through Friday), excluding federal holidays. Access to the base during other times must be requested in writing from the Contracting Officer and will be granted only for extenuating circumstances.

1.37 GOVERNMENT-FURNISHED PROPERTY

Pursuant to CONTRACT CLAUSES clause: "Government Property (Fixed Price Contracts)" the Government will furnish to the Contractor the following property to be installed by the contractor. Government Furnished property will be furnished on-site by the Government. The Contractor shall accept delivery when made and unload property at his own expense. All such property will be installed at the expense of the Contractor. The Contractor shall verify the quantity and condition of such Government-furnished property when delivered to him, acknowledge receipt thereof in writing to the Contracting Officer, and in case of damage to or shortage of such property, shall within 24 hours report in writing such damage or shortage to the Contracting Officer. The contractor shall provide a written schedule of all signs and material required at least 90 days prior to the date the contractor intends to install them.

Quantity	Item Description
LS	All Traffic Signs, posts, sleeves, and hardware

3.2.2 GPS Survey of As-Built Utility Lines

All new underground utility lines (including electrical power and communications, gas, water, sanitary sewer, storm drains, roof drains and culverts) shall be located during installation using Global Positioning Satellite (GPS) surveying equipment. See Section 01040 for additional information.

PART 2 NOT USED

PART 3 EXECUTION

3.1 APPENDIX A - DISTRIBUTION OF CONTRACT DRAWINGS

APPENDIX A
DISTRIBUTION OF CONTRACT DRAWINGS
CHILD DEVELOPMENT CENTER, BUCKLEY AFB, CO

	Number of Sets
U.S. Army Corps of Engineers-Omaha District ATTN: CENWO-PM-M (L. Sand) 106 S. 15th St Omaha, NE 68102 Phone: (402) 221-4595	10
U.S. Army Corps of Engineers-Omaha District ATTN: CENWO-CD-QC (R. Kaminski) 106 S. 15th St Omaha, NE 68102 Phone: (402) 221-4196	2
U.S. Army Corps of Engineers - Denver Resident Office ATTN: Jennifer McQueen 18870 E. Crested Butte Ave, Bldg T2 Buckley AFB, CO 80011 Phone: (303) 367-0335	3
U.S. Army Corps of Engineers Rocky Mountain Area Office ATTN: Matt Ellis 1050 S. Academy Blvd, Suite 100 Colorado Springs, CO 80910 Phone: (719) 570-7797	2
460 CES/CECC ATTN: Scott Hunter 660 S. Aspen Drive, Bldg 1005, Room 239 Buckley AFB Base, CO 80011 Phone: (303) 677-9082	6
460 MSG/SVD ATTN: Major Tim Telega 400 N Beavercreek St Buckley AFB Base, CO 80011 Phone: (303) 677-6919	2
HQAFSPC/SVFC ATTN: Sandi Coleman 150 Vandenberg St, Suite 1105 Peterson AFB, CO 80914-4210 Phone: (719) 554-5671	1
HQ AFSVA/SVP ATTN: Ms. Celi Searless 10100 Reunion Place, Suite 402 San Antonio, TX 78216-4138 Phone: (210) 565-4045	1
Merrick & Company ATTN: Tammy Johnson	6

Child Development Center, Buckley AFB, Co BU37

2450 S. Peoria Street
Aurora, CO 80014
Phone: (303) 751-0741

HQ AFCESA/CESM 1
ATTN: Ray Hansen
139 Barnes Drive, Suite 1
Tyndall AFB, FL 32403-5319
Phone: (850) 283-6317

3.2 APPENDIX B- BUCKLEY AFB CONFINED SPACES GUIDE/AFOSH 91-25

APPENDIX B
BUCKLEY AFB CONFINED SPACES GUIDE/AFOSH 91-25

See attached Buckley AFB Confined Spaces Guide.

A copy of AFOSH 91-25 has been included on the solicitation CD-ROM or may be viewed at:

http://www.e-publishing.af.mil/orgs.asp?type=pubs

Click on Electronic Publications
Click on United States Air Force

Click on 91 Safety

Click on AFOSHSTD91-25

-- End of Section --

General Decision Number: CO030002 08/20/2004 CO2

Superseded General Decision Number: CO020002

State: Colorado

Construction Type: Building

County: Arapahoe County in Colorado.

BUILDING CONSTRUCTION PROJECTS (does not include residential construction consisting of single family homes and apartments up to and including 4 stories)

Modification Number	Publication Date
0	06/13/2003
1	08/15/2003
2	09/19/2003
3	10/03/2003
4	12/05/2003
5	01/16/2004
6	02/20/2004
7	05/14/2004
8	06/18/2004
9	07/23/2004
10	08/20/2004

ASBE0028-001 01/01/2004

	Rates	Fringes
Asbestos Workers/Insulator (Includes application of all insulating materials, protective coverings, coatings and finishings to all types of mechanical systems)	$ 19.47	6.25

BRCO0007-001 01/01/2004

	Rates	Fringes
Bricklayer	$ 20.02	8.20

CARP9901-004 05/01/2004

	Rates	Fringes
Carpenters: Acoustical, Drywall Hanging/Framing and Metal Stud	$ 22.45	7.44

ELEC0068-003 06/01/2004

	Rates	Fringes
Electrician (Including Low Voltage Wiring and Installation of Fire Alarms, Communications Systems and Temperature Controls)	$ 28.91	9.51

ELEV0025-002 01/01/2004

	Rates	Fringes
Elevator Constructor	$ 28.525	10.765+a

FOOTNOTE:
a. Employer contributes 8% of basic hourly rate for over 5 years' service and 6% basic hourly rate for 6 months' to 5 years' service as Vacation Pay Credit.

SEVEN PAID HOLIDAYS: New Year's Day; Memorial Day; Independence Day; Labor Day; Veterans Day; Thanksgiving Day; Friday after Thanksgiving Day; and Christmas Day.

IRON0024-002 08/01/2002

	Rates	Fringes

```
  Ironworker, reinforcing and
  structural.....................$ 22.00            5.85
-----------------------------------------------------------------
LABO0720-001 05/01/2003

                                  Rates          Fringes

  Laborers:
     Common and  Concrete/Mason
     Tenders.....................$ 14.20            4.55
-----------------------------------------------------------------
PAIN0079-002 08/01/2003

                                  Rates          Fringes

  Drywall Finisher/Taper
     Hand........................$ 17.79            5.34
     Tool........................$ 18.14            5.34
  Painters:
     Brush and Roller............$ 17.09            5.34
     Spray.......................$ 18.09            5.34
  Paperhanger....................$ 17.79            5.34
-----------------------------------------------------------------
PAIN0930-001 07/01/2004

                                  Rates          Fringes

  Glazier........................$ 25.85            6.70
-----------------------------------------------------------------
PLAS0577-001 05/01/2004

                                  Rates          Fringes

  Cement Mason/Concrete Finisher.$ 22.31            6.90
-----------------------------------------------------------------
PLUM0003-008 07/01/2004

                                  Rates          Fringes

  Plumber
     (Including HVAC work).......$ 28.02            8.23
-----------------------------------------------------------------
* PLUM0208-007 07/01/2004

                                  Rates          Fringes

  Pipefitter
     (Excluding HVAC work).......$ 27.97            8.33
-----------------------------------------------------------------
SHEE0009-001 07/01/2003

                                  Rates          Fringes

  Sheet metal worker
     (Includes HVAC duct and
     installation of HVAC
     systems)....................$ 26.59            9.70
```

SUCO2001-013 12/20/2001

	Rates	Fringes
Carpenter		
Formbuilding/Formsetting....	$ 15.79	.82
All Other Work.....	$ 17.87	3.55
Laborer		
Brick Finisher/Tender.....	$ 12.98	1.71

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

==========

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations

Wage and Hour Division

U.S. Department of Labor

200 Constitution Avenue, N.W.

Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator

U.S. Department of Labor

200 Constitution Avenue, N.W.

Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board

U.S. Department of Labor

200 Constitution Avenue, N.W.

Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

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General Decision Number: CO030012 08/20/2004 CO12

Superseded General Decision Number: CO020012

State: Colorado

Construction Types: Heavy

Counties: Adams, Arapahoe, Boulder, Denver, Douglas, El Paso, Jefferson, Larimer, Mesa, Pueblo and Weld Counties in Colorado.

HEAVY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	06/13/2003
1	08/15/2003
2	09/19/2003
3	10/03/2003
4	12/05/2003
5	01/16/2004
6	02/20/2004
7	03/05/2004
8	04/16/2004
9	05/14/2004
10	06/18/2004
11	07/23/2004
12	08/13/2004
13	08/20/2004

BRCO0007-006 01/01/2004

ADAMS, ARAPAHOE, BOULDER, DENVER, DOUGLAS, EL PASO, JEFFERSON, AND PUEBLO COUNTIES

	Rates	Fringes
Bricklayer	$ 20.02	8.20

ELEC0012-004 09/01/2003

PUEBLO COUNTY

	Rates	Fringes
Electrician		
Electrical work where the cost is over $200,000	$ 24.74	8.44
Electrical work where the total cost is $200,000 or less	$ 18.98	8.44

ELEC0068-001 06/01/2004

ADAMS, ARAPAHOE, BOULDER, DENVER, DOUGLAS, JEFFERSON, LARIMER, AND WELD COUNTIES

	Rates	Fringes
Electrician	$ 28.91	9.51

ELEC0111-001 07/01/2004

	Rates	Fringes
Line Construction:		
Groundman	$ 14.05	20.75%+4.25
Lineman	$ 27.38	20.75%+4.25

ELEC0113-002 06/01/2004

EL PASO COUNTY

	Rates	Fringes
Electrician	$ 24.54	3%+11.20

ELEC0969-002 12/01/2003

MESA COUNTY

	Rates	Fringes
Electrician	$ 18.40	7.20

ENGI0009-001 05/01/2004

	Rates	Fringes
Power equipment operators:		
Blade: Finish	$ 20.57	6.72
Blade: Rough	$ 20.27	6.72
Bulldozer	$ 20.27	6.72
Cranes: 50 tons and under	$ 20.42	6.72
Cranes: 51 to 90 tons	$ 20.57	6.72
Cranes: 91 to 140 tons	$ 20.72	6.72
Cranes: 141 tons and over	$ 21.48	6.72
Forklift	$ 19.92	6.72
Mechanic	$ 20.42	6.72
Oiler	$ 19.57	6.72
Roller: Self-propelled, all types over 5 tons	$ 20.27	6.72
Roller: Self-propelled, rubber tires under 5 tons	$ 19.92	6.72
Scraper: Single bowl under 40 cubic yards	$ 20.42	6.72
Scraper: Single bowl, including pups 40 cubic yards and over and tandem bowls	$ 20.57	6.72
Trackhoe	$ 20.42	6.72

IRON0024-003 08/01/2002

	Rates	Fringes
Ironworkers: Structural	$ 22.00	7.61

LABO0086-001 05/01/2003

	Rates	Fringes
Laborers:		
Pipelayer	$ 16.29	4.25

---

* PLUM0003-005 07/01/2004

ADAMS, ARAPAHOE, BOULDER, DENVER, DOUGLAS, JEFFERSON, LARIMER AND WELD COUNTIES

	Rates	Fringes
Plumber	$ 28.02	8.23

---

* PLUM0058-002 07/01/2004

EL PASO COUNTY

	Rates	Fringes
Plumbers and Pipefitters	$ 24.85	8.85

---

* PLUM0058-008 07/01/2004

PUEBLO COUNTY

	Rates	Fringes
Plumbers and Pipefitters		
Free Zone - 0 to 40 miles...	$ 20.10	8.85

Zone 1 - 40 miles and over: $19.85 per hour + $32.00 per day per diem will be paid on projects over 40 miles (Zone 1) measured in practical driving miles by the shortest route, beginning at 5th and Main Streets in Pueblo, Colorado, when the employee stays overnight or drives their own vehicle.

Hazardous pay: Add $2.20 per hour to base rate. Hazardous pay applies to projects at chemical plants, steel mills, cement plants, power generator plants, process piping at manufacturing plants, food processing plants, and all projects which may present a health hazard or serious personal injury.

PLUM0145-002 05/01/2004

MESA COUNTY

	Rates	Fringes
Plumbers and Pipefitters.....	$ 22.28	6.95

---

* PLUM0208-004 07/01/2004

ADAMS, ARAPAHOE, BOULDER, DENVER, DOUGLAS, LARIMER AND WELD COUNTIES

	Rates	Fringes
Pipefitter.....	$ 27.97	8.33

SHEE0009-002 07/01/2003

	Rates	Fringes
Sheet metal worker.....	$ 26.59	9.70

SUCO2001-006 12/20/2001

	Rates	Fringes
Boilermaker.....	$ 17.60	
Carpenters:		
Form Building and Setting...	$ 16.97	2.74
All Other Work.....	$ 15.14	3.37
Cement Mason/Concrete Finisher.	$ 17.31	2.85
Ironworker, Reinforcing.....	$ 18.83	3.90
Laborers:		
Common.....	$ 11.22	2.92
Flagger.....	$ 8.91	3.80

Landscape	$ 12.56	3.21
Painters:		
Brush, Roller & Spray	$ 15.81	3.26
Power equipment operators:		
Backhoe	$ 16.36	2.48
Front End Loader	$ 17.24	3.23
Skid Loader	$ 15.37	4.41

TEAM0435-001 05/01/2000

	Rates	Fringes
Truck drivers:		
Pickup	$ 14.21	5.27
Tandem/Semi and Water	$ 14.93	5.27

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

==========

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the

Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations

Wage and Hour Division

U.S. Department of Labor

200 Constitution Avenue, N.W.

Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator

U.S. Department of Labor

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Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board

U.S. Department of Labor

200 Constitution Avenue, N.W.

Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

==========

END OF GENERAL DECISION

BASE CIVIL ENGINEERING WORK CLEARANCE REQUEST

(See Instructions on Reverse)

DATE PREPARED

1. Clearance is requested to proceed with work at _____

on Work Order No. _____ , Contract No._____ , involving excavation or utility disturbance per

attached sketch. This area ☐ has ☐ has not been staked or clearly marked.

2. TYPE OF FACILITY/WORK INVOLVED

	A. PAVEMENTS		D. FIRE DETECTION & PROTECTION SYSTEMS					G. AIRCRAFT OR VEHICULAR TRAFFIC FLOW
	B. DRAINAGE SYSTEMS		E. UTILITY		OVERHEAD		UNDERGROUND	H. SECURITY
	C. RAILROAD TRACKS		F. COMM		OVERHEAD		UNDERGROUND	I. OTHER

3. DATE CLEARANCE REQUIRED	4. DATE OF CLEARANCE	
5. SIGNATURE OF REQUESTING OFFICIAL	6. TELEPHONE NO.	7. ORGANIZATION

	ORGANIZATION	REMARKS *(Use Reverse for additional comments)*	REVIEWER'S NAME AND INITIALS
8. BASE CIVIL ENGINEERING	A. ELECTRICAL DISTRIBUTION		
	B. STEAM DISTRIBUTION		
	C. WATER DISTRIBUTION		
	D. POL DISTRIBUTION		
	E. SEWER DISTRIBUTION		
	F. ENVIRONMENTAL		
	G. PAVEMENTS/ GROUNDS		
	H. FIRE PROTECTION		
	I. ZONE _____		
	J. OTHER *(Specify)*		
9. SECURITY POLICE			
10. SAFETY			
11. COMMUNICATIONS			
12. BASE OPERATIONS			
13. CABLE TV			
14. COMMERCIAL UTILITY COMPANY ☐ TELEPHONE ☐ GAS ☐ ELECTRIC			

15. OTHER *(Specify)* _____

16. REQUESTED CLEARANCE ☐ APPROVED ☐ DISAPPROVED

17. TYPED NAME AND SIGNATURE OF APPROVING OFFICER *(Chief of Operations Flight or Chief of Engineering Flight)*	17a. DATE SIGNED

INSTRUCTIONS

The BCE work clearance request is used for any work (contract or in-house) that may disrupt aircraft or vehicular traffic flow, base utility services, protection provided by fire and intrusion alarm system, or routine activities of the installation. This form is used to coordinate the required work with key base activities and keep customer inconvenience to a minimum. It is also used to identify potentially hazardous work conditions in an attempt to prevent accidents. The work clearance request is processed just prior to the start of work. If delays are encountered and the conditions at the job site change (or may have changed) this work clearance request must be reprocessed.

18. REMARKS. *(This section must describe specific precautionary measure to be taken before and during work accomplishment. Specific comments concerning the approved method of excavation, hand or powered equipment, should be included.)*

CONTRACTOR'S EMPLOYEE'S VERIFICATION LIST
THIS FORM IS SUBJECT TO THE PRIVACY ACT OF 1974

CONTRACTOR'S NAME _____
ADDRESS & PHONE _____

_____

DATE _____

POINT OF CONTACT _____

SITE LOCATION_____

PLEASE LIST NAMES AND COMPANIES IN APHABETICAL ORDER

NAME LAST FIRST MI	COMPANY NAME	CONTRACT EXPIRATION	SSAN	DATE OF BIRTH

CONTRACTOR'S EMPLOYEE'S VERIFICATION LIST
140 SPS/SP FORM 19, NOV 93

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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01040

AS-BUILT DRAWINGS

05/04

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-- End of Section Table of Contents --

SECTION 01040

AS-BUILT DRAWINGS
05/04

PART 1 GENERAL

1.1 DEFINITIONS

The definitions listed below form a part of this specification.

1.1.1 Red-Line Drawings

Contract drawings marked-up to show actual work performed to include necessary sketches, modification drawings, shop drawings and notes. Green ink is used to indicate work deleted from the contract. Red ink is used for additions and deviations from the contract.

1.1.2 As-Built Drawings

Professional finished drawings and electronic CADD files developed from the original contract drawings that include all of the information from the redline drawings and the GPS coordinates of utility lines, and suitable for half-size reproduction.

1.1.3 Not Used

1.1.4 Black-Line Drawings

Paper drawings reproduced from electronic CADD files or high quality reproducible drawings.

1.1.5 Full-Size Drawings

28 inches x 40 inches nominal size drawings with all details visually readable.

1.1.6 Modification Circle

A circle with a horizontal line through the center. The top half will contain the letter "P" with the bottom half containing the Modification number. The lettering standard will be 1/8-inch (AutoCAD) Romans.shx.

1.1.7 Not Used

1.1.8 Electronic CADD Files

Electronic CADD files are files saved on CD-ROM in accordance with appropriate CADD standard. The CADD standard will include level on/off status, special characters, line wieghts, font, and size requirements.

1.2 GENERAL REQUIREMENTS

The work includes creation of bond paper drawings and electronic CADD files on AutoCADD 2002 for as-built drawings to accurately depict existing conditions of the project. As-Built Drawings will become the permanent

record drawings of the construction. The Contractor is responsible for development of electronic CADD files in accordance with Omaha District CADD standards. Omaha District AutoCADD Standards will be made available to the successful offeror. AutoCADD Standard utilize the National CAD standards with Omaha District refinements concerning file names, layers, colors, line widths, details and symbols. See requirements in this section for a summary of Omaha District file format and font requirements. The Contractor shall be responsible for furnishing the required CAD software. The Omaha District will furnish a CD of CAD (read-write) contract drawing files in the software language specified in paragraph Procedure below. This is the software language required by the Using Service. These drawing files shall be used to prepare required As-Built drawings. The As-Built drawings shall include all major features of the work and all details to the same level as the original contract set of drawings. All changes from the contract drawings, including but not limited to all deviations, additional information, and modifications to the contract shall be shown on the as-builts. GPS coordinates of all utility lines will be shown on the As-Built drawings. Where contract drawings or specifications allow for options, only the option selected and actually constructed shall be shown on the As-Built Drawings. Systems designed or enhanced by the Contractor such as HVAC control system, fire alarm system fire sprinkler system, irrigation sprinkler system, and letters of clarification, shall be accurately and neatly recorded on the As-Built Drawings using the same symbols, terminology, and general quality as the original set of contract drawings. All sheets affected by a change shall be revised. The transmittal requirements for the As-built Drawings shall be shown as events on the Contractor prepared project schedule.

1.3 PAYMENT

In accordance with the clause "Payment Under Fixed - Price Construction Contracts", which provides for progress payments on estimates of work accomplished (which meets the standards of quality established under the contract), $106,500 will be withheld from payment for the creation of As-Built drawings until the final as-built drawings are delivered to the Contracting Officer (including any necessary revisions and subject to the approval of the Contracting Officer).

The Government will assign the Contractor a performance rating (CCASS for Corps of Engineers projects) upon completion of the project. The timeliness of satisfactory As-Built drawing submittals will be an important factor in determining the assigned rating. An unsatisfactory performance of As-Built drawings creation will be given to the Contractor if the Contractor demonstrates an unwillingness to work with the Government on As-Built drawing creation or the Contractor fails to submit satisfactory Final As-Built drawings within 60 calendar days of turning the completed project over to the Using Service. If satisfactory As-Built drawings are not received within 120 days of turning the project over to the Using Service, the government will utilze the funds withheld to complete the As-Builts.

1.4 TRANSMITTAL OF AS-BUILT DRAWINGS

1.4.1 Preliminary As-Built Drawings

The Contractor shall produce Preliminary As-Built Drawings indicating as-built conditions on AutoCADD (Version 2002) with "clouding".The Contractor shall contact Jim Janicek at (402)221-4519 before beginning As-Built preparation. As-Built preparation process is provided in paragraph

As-Built Preparation below. Preliminary drawings shall consist of 15 percent of total project drawings. These drawings shall be sheets used for the construction of this project (exludes Cover Sheet, Vicinity Map, Location Plan and Indexes). The As-Built CADD files which include all changes up to the time Preliminary Drawings shall be sent as stated below. The Contractor shall draw attention to all drawing changes by "clouding" the affected area. This "clouding" shall be accomplished on layer 63 of the drawing file. The Preliminary Drawings shall consist of one (1) set of CADD files on a CD-ROM and one (1) full-size set of the Black-Line Drawings. One (1) set of CADD files on a CD-ROM shall be submitted to the Omaha District Office (ATTN: CENWO-ED-DI, Jim Janicek). In conjunction with this submission, one (1) full-size set of the Black-Line Drawings shall be submitted to the COR. Both documents shall be submitted three (3)weeks prior to the final acceptance inspection unless otherwise directed by the COR. The COR will notify the Contractor in writing of approval / disapproval. The Contractor shall not submit the Final Drawings until he receives the COR's letter approving the Preliminary Drawings.

1.4.2 Final As-Built Drawings

The Contractor shall produce Final As-Built Drawings on AutoCADD (Version 2002) without "clouding". The As-Built preparation process is provided in paragraph As-Built Preparation below. The Final Drawings shall include all changes. The Final Drawings in the form of a CD-ROM shall be submitted to the COR and Omaha District Office (CENWO-ED-DI) no earlier than the day of acceptance of the project and no later than thirty (30) days after the date on the acceptance letter for the Preliminary Drawing unless otherwise directed by the COR. (Note: Final drawings shall not be forwarded to the customer. Corps of Engineers, Omaha District COR will forward to the customer after Quality Review.) Contractor shall submit one (1) set of CADD files on a CD-ROM to the Omaha District Office (ATTN: CENWO-ED-DI, Jim Janicek). Contractor shall send the following documents to the COR:

a) One (1) set of CADD files on CD-ROM (folder name containing as-built files shall be designated "AS-BUILTS" on each CD-ROM). Both CD case and CD-ROM shall contain the name of the project, location, specification number, and contract number, and words "As-Built Record Set"). The folder shall contain drawings, indexes and X-REF files related to all as-builts.

b) One (1) full-size set of bond paper As-Built Drawings, along with all red-lined hard copy drawings prepared by the Contractor during construction.

COR will forward one (1) full-size set of drawings along with CD-ROM to the customer after the Quality Review is completed.

1.4.3 As-Built Preparation

Both preliminary and final electronic as-built drawings shall be produced in accordance with the following process for AutoCADD drawings:

1.4.3.1 Not Used

1.4.3.2 For AutoCADD (*DWG) Files

a. When opened, the drawing shall be seen exactly as it should be plotted.
b. The view shall be zoomed to fit the border.
c. All information in the title block shall filled in, including plot

scale.
d. The information in the title block shall be correct, including the design file name and the plot scale.
e. All files shall reference an AutoCAD border supplied by the Omaha District.
f. All unnecessary information outside the border shall be deleted.
g. All files shall be purged.
h. All xrefs shall be included.
i. All fonts used shall be included with the set, even if it is the standard AutoCAD fonts.
j. An ASCII text file shall be provided with the following information: the name and phone number of the person we need to contact if we have problems, and the version of AutoCAD used to create and/or work on the drawings.
k. Both the .ctb file and the .pc3 file shall be supplied.
l. Each sheet/design shall have its own file and file name.
m. All proxy graphics shall be exploded to allow editing with AutoCAD without the use of Autodesk desktop software.
n. Half toning shall be accomplished by using the colors 8, 9, or 250-255 and setting the pen table to plot referenced colors to half tone.

1.5 PROCEDURE

Upon award of this contract, and after the Contractor reproduces hard-copy sets of contract drawings, one (1) CD-ROM containing the contract drawings (read-write CADD files) and CADD standards in AutoCADD (Version 2002) format, for use in the preparation of As-Built Drawings by the Contractor, will be forwarded to the Resident Engineer. This CD-ROM will then be furnished to the Contractor after signed receipt to the Resident Engineer. The Contractor shall utilize this CD-ROM to create a set of electronic Cadd files and full-size Red-Line Drawings to fully indicate As-Built conditions. The Red-Line Drawings shall be maintained at the site, in a current condition until the completion of the work and shall be available for review by the COR at all times. All as-built conditions shall be on the Red-Line Drawings within two (2) days after the work activity is completed or shall be entered on the deficiency tracking system (see Section 01451A, CONTRACTOR QUALITY CONTROL). The Contractor shall not convert electronic drawing files from one software language to another (i.e. Microstation to AutoCADD or AutoCADD to Microstation).

1.6 TITLE BLOCKS

The contract number and the specification number (if available) shall be shown on all sheets. "RECORD DRAWING" shall be added below the title block on all sheets. All modifications to the contract shall be posted in ascending order. The top line of the revision box shall state "REVISED TO SHOW AS-BUILT CONDITIONS" and dated. All modifications to all plans, sections, or details, shall have a modification number placed in the revision box under column entitled "Symbol". The statement "GENERAL REVISIONS" may be used when applicable. The date to be added in the revision box for modifications is found in Block 3 of Form SF-30. Cover Sheet will have Contract Award Set changed to As-Built Record Set with month & year completed. Month and year completed will also go in the date box in the title block. There will be no separate dates.

1.7 PROCEDURES FOR POSTING MODIFICATION CHANGES TO DRAWINGS

Follow directions in the modification for posting descriptive changes.
A Modification Circle shall be place at the location of each deletion.
The highest modification number on the sheet should be shown in the modification circle in the "DATE" and "DRAWING CODE" boxes of the title block.
For all new details or sections that are added to a drawing, place a Modification Circle by the detail or section title.

For changes to a drawing, place a Modification Circle by the title of the affected plan, section or detail titles (each location).
For changes to schedules on drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.
The Modification Circle size shall be 1/2-inch diameter unless the area where circle is to be placed is crowded. Use smaller size circle for crowded areas.

1.8 WORD ABBREVIATIONS

Abbreviations shown on the abbreviation sheet shall be used to describe all work items. Additional word abbreviations, not found on the abbreviation sheet but necessary to describe the work, shall be properly identified and incorporated with the other standard word abbreviations.

1.9 LEGEND SHEETS

Symbols, which conflict with those on the original contract legend sheet, shall not be used. Additional symbols, necessary to depict any additional work items, shall be properly identified and added to the legend sheet or supplemental legend. Those projects that do not have legend sheets may use supplemental legends on each sheet where symbol is shown.

1.10 CONTRACTOR SHOP DRAWINGS

Contractor shop drawings,which supersede data on the contract plans and/or additional drawings, prepared by the Contractor, shall be incorporated into the As-Built Drawings. Design plans prepared by Contractor shall include the designer's name on the As-Built Drawings.

1.11 INDEXING OF DRAWINGS

If drawings are added to the portfolio of drawings to depict as-built conditions, the index of drawings shall be revised accordingly.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL

As-Built drawings shall include as-built information to the same level of detail as shown on the original details, unless otherwise specified. The Contractor shall provide any additional full-size drawings as required to display all the details.

3.2 SITE WORK

3.2.1 Utilities

All utilities shall be shown whether active, inactive, shown on the original contract drawings, or found on-site. The type of utility, location, general direction, size, material make-up and depth shall be shown. The location and description of any utility line or other installations of any kind known to exist within the construction area shall be shown. The location shall include dimensions to permanent features.

3.2.1.1 GPS Survey of As-Built Utility Lines

All new underground utility lines (including electrical power and communications, gas, water, sanitary sewer, storm drains, roof drains and culverts) shall be located during installation using Global Positioning Satellite (GPS) surveying equipment. The Contractor shall survey pipe invert of gas, water, sanitary sewer, storm drains, roof drains and culverts and top of duct bank of electrical power and communications lines. Storm drains and sanitary sewer lines shall be surveyed where pipes enter manholes and inlets and at 100-foot maximum intervals along the line. The inverts of all cleanouts and tees shall be surveyed. Inverts at each end of culverts shall be surveyed. Electrical power, communications, gas and water lines shall be surveyed at all manholes, tees, valves, corners, changes in direction and at intervals along the line which will accurately depict the location of the line in both horizonal and vertical directions (50-foot maximum interval). Survey accuracy shall meet or exceed National Map Standards for 1"-50' mapping. Survey horizontal datum shall be Colorado State Plane, Central Zone, NAD 83 and vertical datum shall be NAVD 1988. New underground utility lines shall be shown as 3-dimensional elements in a AutoCAD file. AutoCAD layer structure shall conform to Tri-Service standards.

3.2.2 Structures

Structures above and below ground shall be shown. The size, material make-up, location, height, and/or depth shall be shown. Manholes shall show rim elevation and invert elevations as applicable. Power poles shall show electrical equipment and voltage rating.

3.2.3 Grades

Grade or alignment of roads, structures, or utilities shall be corrected if any changes were made from the contract drawings. Elevations shall be corrected if changes were made in site grading.

3.3 STRUCTURAL

3.3.1 Steel/Concrete

Shop drawings that deviate from the contract drawings shall be incorporated in the As-Built Drawings.

3.4 MECHANICAL

3.4.1 Ductwork

Ductwork shall be shown to reflect actual installation and duct size.

Ductwork routing changes shall be shown.

3.4.2 Plumbing

Piping and fixtures shall be shown to reflect the type of material, size and the route or location.

3.5 ELECTRICAL

3.5.1 PANELS

All contract drawing panel schedules shall be revised to show as-built conditions. Home-run circuit designation on electrical drawings shall accurately correspond to the as-built panel schedules.

3.5.2 Controls

All control diagrams in contract drawings shall be revised to reflect as-built conditions, and setpoints.

-- End of Section --

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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01200

WARRANTY OF CONSTRUCTION

5/00; Rev 02/02

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SECTION 01200

WARRANTY OF CONSTRUCTION
5/00; Rev 02/02

PART 1 GENERAL

1.1 WARRANTY OF CONSTRUCTION

(a) Foremost and in addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

(b) This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

(c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of--

(1) The Contractor's failure to conform to contract requirements; or

(2) Any defect of equipment, material, workmanship, or design furnished by the Contractor.

(d) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause.

(e) The Contractor's warranty with respect to work restored, repaired or replaced will run for 1 year from the date of restoration, repair or replacement. This provision applies equally to all items restored, repaired, or replaced under paragraph (c) and (d) above.

(f) The Government will notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage. Repair work necessary to correct a warranty condition which arises to threaten the health or safety of personnel, the physical safety of property or equipment, or which impairs operations, habitability of living spaces, etc., will be performed by the Contractor on an immediate basis as directed verbally by the Government. Written verification will follow verbal instruction.

(g) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of verbal or written notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(h) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall--

(1) Obtain all warranties that would be given in normal commercial practice;

(2) Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and

(3) Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

(i) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(j) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

(k) This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

(l) The Prime Contractor shall designate a representative to attend and chair warranty meetings that will be held each month at the project site for the duration of the warranty period, with government and subcontractor personnel as necessary. The meeting shall review past warranty corrections and response times, open warranty items, up-coming scheduled corrections, site investigations, and other issues.

1.2 ADDITIONAL WARRANTY REQUIREMENTS

1.2.1 Performance Bond

(a) It is understood that the Contractor's Performance Bond will remain effective for one (1) year from the date of acceptance.

(b) If either the Contractor or his representative doesn't diligently pursue warranty work to completion, the contractor and surety will be liable for all costs. The Government, at its option, will either have the work performed by others or require the surety to have it done. Both direct and administrative costs will be reimbursable to the Government.

1.2.2 Pre-Warranty Conference

(a) Prior to contract completion and at a time designated by the Contracting Officer or his authorized representative, the Contractor shall meet with the Contracting Officer or his authorized representative to develop a mutual understanding with respect to the requirements of the Paragraph: WARRANTY OF CONSTRUCTION. Communication procedures for Contractor notification of warranty defects, priorities with respect to the type of defect and other

details deemed necessary by the Contracting Officer or his authorized representative for the execution of the construction warranty shall be established/reviewed at this meeting.

(b) In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor will furnish the name, telephone number and address of the service representative which is authorized to initiate and pursue warranty work action on behalf of the Contractor and surety. This single point of contact will be located within the local service area of the warranted construction, will be continuously available, and will be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any Contractual responsibilities in connection with the paragraph: WARRANTY OF CONSTRUCTION.

(c) Local service area is defined as the area in which the contractor or his representative can meet the response times as described in paragraph 1.2.4 and in any event shall not exceed 200 miles radius of the construction site.

1.2.3 Equipment Warranty Identification

The Contractor shall provide warranty identification tags on all mechanical and electrical equipment installed under this contract. Tags and installation shall be in accordance with the requirements of Paragraph: EQUIPMENT WARRANTY IDENTIFICATION TAGS.

1.2.4 Warranty Service Calls

The Contractor or his local service representative will respond to the site, to a call within the time periods as follows: Four (4) hours for Heating, Air Conditioning, Refrigeration, Air Supply and Distribution, Critical Electrical service Systems and Food Service Equipment and Twenty-Four (24) hours For All Other Systems.

1.2.5 Equipment Warranty Booklet

At or before 30 days prior to final inspection and acceptance of the work, the Contractor shall submit the data mentioned as follows:

The Contractor shall provided a Booklet, which consists of a listing of all equipment items (see paragraphs a. and b. below) which are specified to be guaranteed along with the warranty papers for each piece of equipment. Three (3) legible bound copies of the booklet shall be submitted for approval and shall be indexed alphabetically by equipment type. For each specific guaranteed item, the name, address, and telephone number shall be shown on the list for the subcontractor who installed equipment, equipment supplier or distributor, and equipment manufacturer. Completion date of the guarantee period shall correspond to the applicable specification requirements for each guaranteed item. The names of service representatives that will make warranty calls along with the day, night, weekend and holiday contacts for response to a call within the time period specified shall also be identified.

a. For Equipment in Place: The equipment list shall show unit retail value and nameplate data including model number, size, manufacturer, etc. This would include capital equipment and other nonexpendable supplies of a movable nature that are not affixed as an integral part of the facility and

may be removed without destroying or reducing the usefulness of the facility. Some examples are spare parts, special tools, manufacturing equipment, maintenance equipment, instruments, installed under this contract.

b. For Installed Building Equipment: The equipment list shall show unit retail value and nameplate data including model number, size, manufacturer, etc. This would include items of equipment and furnishings (including material for installation thereof), which are required to make the facility usable and are affixed as a permanent part of the structure. Some examples are plumbing fixtures, laboratory counters and cabinets, kitchen equipment, mechanical equipment, electrical equipment, and fire protection systems installed under this contract.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-11 Closeout Submittals

Equipment Warranty Booklet

1.4 EQUIPMENT WARRANTY IDENTIFICATIONS TAGS

1.4.1 GENERAL REQUIREMENTS

The Contractor shall provide warranty identification tags on all Contractor and government furnished equipment which is Contractor installed.

1.4.1.1 Tags and Information

The tags and information shall be similar in format and size to the exhibits provided by this specification, and shall be suitable for interior and exterior locations, resistant to solvents, abrasion, and to fading caused by sunlight, precipitation, etc. These tags shall have a permanent pressure- sensitive adhesive back, and shall be installed in a position that is easily (or most easily) noticeable. If the equipment surface is not suitable for adhesive back, Contractor shall submit his alternative to the Contracting Officer's Authorized Representative for review and approval. Contractor furnished equipment that has differing warranties on its components will have each component tagged.

1.4.1.2 Tags for Warranted Equipment

The tag for his equipment shall be similar to the following:

```
+-------------------------------------------+
|            EQUIPMENT WARRANTY             |
|                                           |
|      CONTRACTOR FURNISHED EQUIPMENT       |
|                                           |
|                                           |
| MFG----------------MODEL NO.-----------  |
|                                           |
| SERIAL NO.------------------------------ |
```

```
|                                          |
| CONTRACT NO.---------------------------- |
|                                          |
| CONTRACTOR NAME------------------------- |
|                                          |
| CONTRACTOR ADDRESS---------------------- |
|                                          |
| CONTRACTOR TELEPHONE-------------------- |
|                                          |
| CONTRACTOR WARRANTY EXPIRES------------- |
|                                          |
| IN CASE OF WARRANTY ACTION FIRST CONTACT |
|                                          |
|     [DEH] [BCE] AT [TELEPHONE NUMBER]    |
|                                          |
+------------------------------------------+
```

```
+--------------------------------------------------+
|                                                  |
|                EQUIPMENT WARRANTY                |
|                                                  |
|          GOVERNMENT FURNISHED EQUIPMENT          |
|                                                  |
|  MFG ________________  MODEL NO._______________  |
|                                                  |
|  SERIAL NO. ___________________________________  |
|                                                  |
|  CONTRACT NO. _________________________________  |
|                                                  |
|  DATE EQUIP PLACED IN SERVICE ________________   |
|                                                  |
+--------------------------------------------------+
```

1.4.1.3 Exclusion to Providing Tags

If the manufacturer's name (MFG), model number and serial number are on the manufacturer's equipment data plate and this data plate is easily found and fully legible, this information need not be duplicated on the equipment warranty tag. The Contractor's warranty expiration date and the final manufacturer's warranty expiration date will be determined as specified by the Paragraph "WARRANTY OF CONSTRUCTION".

1.4.2 EXECUTION

The Contractor will complete the required information on each tag and install these tags on the equipment by the time of and as a condition of final acceptance of the equipment. The Contractor shall be responsible for scheduling acceptance inspection with the Contracting Officer (verbal and written notification required). If this inspection is delayed by the Contractor, the Contractor shall, at his own expense, update the in-service and warranty expiration dates on these tags.

1.4.3 Equipment Warranty Tag Replacement

Under the terms of this contract, the Contractor's warranty with respect to work repaired or replaced shall run for one year from the date of repair or replacement. Such activity shall include a data warranty identification tag on the repaired or replaced equipment. The tag shall be furnished and

installed by the Contractor, and shall be similar to the original tag, except that it should include the scope of repair and that the contractor's warranty expiration date will be one year from the date of acceptance of the repair or replacement. In the case of repair, the repair only will be covered by the extended warranty. In the case of replacement of a component, the component only will be covered by the extended warranty. In these cases, the original tags will not be removed, but an additional tag will be installed for the repair or component replacement.

PART 2 NOT USED

PART 3 NOT USED

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SECTION 01320A

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05/02; Omaha Rev. 01/04

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SECTION 01320A

PROJECT SCHEDULE
05/02; Omaha Rev. 01/04

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of the specification to the extent referenced. The publications are referenced in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1-1-11	(1995) Progress, Schedules, and Network Analysis Systems

1.2 QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS, a Project Schedule as described below shall be prepared. The scheduling of construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments. The scheduler shall be a direct employee of the prime contractor and have a minimum of 2 years experience in scheduling.

3.2 BASIS FOR PAYMENT

The schedule shall be the basis for measuring Contractor progress. Lack of an approved schedule or scheduling personnel will result in an inability of the Contracting Officer to evaluate Contractor's progress for the purposes of payment. Failure of the Contractor to provide all information, as specified below, shall result in the disapproval of the entire Project Schedule submission and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the Contracting Officer and those revisions have not been included in the Project Schedule, the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification. Failure of the Contractor to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the Contracting Officer.

3.3.1 Use of the Critical Path Method

The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in the Precedence Diagram Method (PDM).

3.3.2 Level of Detail Required

The Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the Contracting Officer at the appropriate level of detail, as specified by the Contracting Officer, shall result in the disapproval of the schedule. The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule:

3.3.2.1 Activity Durations

Contractor submissions shall follow the direction of the Contracting Officer regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods (usually less than 2 percent of all non-procurement activities' Original Durations are greater than 20 days).

3.3.2.2 Procurement Activities

Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, and delivery.

3.3.2.3 Critical Activities

The following activities shall be listed as separate line activities on the Contractor's project schedule:

a. Submission and approval of mechanical/electrical layout drawings.

b. Submission and approval of O & M manuals.

c. Submission and approval of as-built drawings.

d. Submission and approval of 1354 data and installed equipment lists.

e. Submission and approval of testing and air balance (TAB).

f. Submission of TAB specialist design review report.

g. Submission and approval of fire protection specialist.

h. Submission and approval of testing and balancing of HVAC plus commissioning plans and data.

i. Air and water balance dates.

j. HVAC commissioning dates.

k. Controls testing plan.

l. Controls testing.

m. Performance Verification testing.

n. Other systems testing, if required.

o. Prefinal inspection.

p. Correction of punchlist from prefinal inspection.

q. Final inspection.

3.3.2.4 Government Activities

Government and other agency activities that could impact progress shall be shown. These activities include, but are not limited to: approvals, inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements.

3.3.2.5 Responsibility

All activities shall be identified in the project schedule by the party responsible to perform the work. Responsibility includes, but is not limited to, the subcontracting firm, contractor work force, or government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.

3.3.2.6 Work Areas

All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code.

3.3.2.7 Modification or Claim Number

Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a mod or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Mod or Claim Number. Whenever possible, changes shall be added to the schedule by adding new activities. Existing activities shall not normally be changed to reflect modifications.

3.3.2.8 Bid Item

All activities shall be identified in the project schedule by the Bid Item to which the activity belongs. An activity shall not contain work in more than one bid item. The bid item for each appropriate activity shall be identified by the Bid Item Code.

3.3.2.9 Phase of Work

All activities shall be identified in the project schedule by the phases of work in which the activity occurs. Activities shall not contain work in more than one phase of work. The project phase of each activity shall be by the unique Phase of Work Code.

3.3.2.10 Category of Work

All Activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited, to the procurement chain of activities including such items as submittals approvals, procurement, fabrication, delivery, installation, start-up, and testing. The category of work for each activity shall be identified by the Category of Work Code.

3.3.2.11 Feature of Work

All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to, a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code.

3.3.3 Scheduled Project Completion

The schedule interval shall extend from NTP to the contract completion date.

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date on which the NTP was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called "Start Project". The "Start Project" activity shall have an "ES" constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.3.2 Constraint of Last Activity

Completion of the last activity in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity called "End Project". The "End Project" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.3.3 Early Project Completion

In the event the project schedule shows completion of the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are

scheduled in parallel to support the Contractor's "early" completion. Contractor shall specifically address each of the activities noted in the narrative report at every project schedule update period to assist the Contracting Officer in evaluating the Contractor's ability to actually complete prior to the contract period.

3.3.4 Interim Completion Dates

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.4.1 Start Phase

The Contractor shall include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have an "ES" constraint date equal to the date on which the NTP was acknowledged, and a zero day duration.

3.3.4.2 End Phase

The Contractor shall include as the last activity in a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.4.3 Phase X

The Contractor shall include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" activity shall be logically tied to the earliest and latest activities in the phase.

3.3.5 Default Progress Data Disallowed

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control report for every in-progress or completed activity, and failure to ensure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Program features which calculate one of these parameters from the other shall be disabled.

3.3.6 Out-of-Sequence Progress

Activities that have posted progress without all preceding logic being satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case approval of the Contracting Officer. The Contractor shall propose logic corrections to eliminate all out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule.

3.3.7 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.

3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1 Preliminary Project Schedule Submission

The Preliminary Project Schedule, defining the Contractor's planned operations for the first 60 calendar days shall be submitted for approval within 20 calendar days after the NTP is acknowledged. The approved preliminary schedule shall be used for payment purposes not to exceed 60 calendar days after NTP.

3.4.2 Initial Project Schedule Submission

The Initial Project Schedule shall be submitted for approval within 40 calendar days after NTP. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail.

3.4.3 Monthly Schedule Updates

Based on the result of progress meetings, specified in "Monthly Progress Meetings," the Contractor shall submit monthly schedule updates. These submissions shall enable the Contracting Officer to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgement of the Contracting Officer or authorized representative is necessary for verifying the Contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.4.4 Standard Activity Coding Dictionary

The Contractor shall use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11, Appendix A. This exact structure is mandatory, even if some fields are not used.

3.5 SUBMISSION REQUIREMENTS

The following items shall be submitted by the Contractor for the preliminary submission, initial submission, and every monthly project schedule update throughout the life of the project:

3.5.1 Data Disks

Two data disks containing the project schedule shall be provided. Data on the disks shall adhere to the SDEF format specified in ER 1-1-11, Appendix A.

3.5.1.1 File Medium

Required data shall be submitted on 3.5-inch disks, formatted to hold 1.44 MB of data or CD-ROM, compatible with Microsoft Windows 2000 operating

systems, unless otherwise approved by the Contracting Officer.

3.5.1.2 Disk Label

A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Preliminary, Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number or person responsible for the schedule.

3.5.1.3 File Name

Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will ensure that the names of the files submitted are unique. The Contractor shall submit the file naming convention to the Contracting Officer for approval.

3.5.2 Narrative Report

A Narrative Report shall be provided with the preliminary, initial, and each update of the project schedule. This report shall be provided as the basis of the Contractor's progress payment request. The Narrative Report shall include: a description of activities along the 2 most critical paths, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken. The narrative report is expected to relay to the Government, the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis.

3.5.3 Approved Changes Verification

Only project schedule changes that have been previously approved by the Contracting Officer shall be included in the schedule submission. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float. Actual Start and Actual Finish Dates shall be printed for those activities in progress or completed.

3.5.4.1 Activity Report

A list of all activities sorted according to activity number.

3.5.4.2 Logic Report

A list of Preceding and Succeeding activities for every activity in ascending order by activity number. Preceeding and succeeding activities shall include all information listed above in paragraph Schedule Reports. A blank line shall be left between each activity grouping.

3.5.4.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates. Completed activities shall not be shown on this report.

3.5.4.4 Earnings Report

A compilation of the Contractor's Total Earnings on the project from the NTP until the most recent Monthly Progress Meeting. This report shall reflect the Earnings of specific activities based on the agreements made in the field and approved between the Contractor and Contracting Officer at the most recent Monthly Progress Meeting. Provided that the Contractor has provided a complete schedule update, this report shall serve as the basis of determining Contractor Payment. Activities shall be grouped by bid item and sorted by activity numbers. This report shall: sum all activities in a bid item and provide a bid item percent; and complete and sum all bid items to provide a total project percent complete. The printed report shall contain, for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), and Earnings to Date.

3.5.5 Network Diagram

The network diagram shall be required on the initial schedule submission and on monthly schedule update submissions. The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left. The activity number, description, duration, and estimated earned value shall be shown on the diagram.

3.5.5.2 Project Milestone Dates

Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

The critical path shall be clearly shown.

3.5.5.4 Banding

Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a monthly onsite meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor shall describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer will approve activity progress, proposed revisions, and adjustments as appropriate.

3.6.1 Meeting Attendance

The Contractor's Project Manager and Scheduler shall attend the regular progress meeting.

3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after the monthly progress meeting.

3.6.3 Progress Meeting Contents

Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost-to-Date shall be subject to the approval of the Contracting Officer. As a minimum, the Contractor shall address the following items on an activity by activity basis during each progress meeting.

3.6.3.1 Start and Finish Dates

The Actual Start and Actual Finish dates for each activity currently in-progress or completed.

3.6.3.2 Time Completion

The estimated Remaining Duration for each activity in-progress. Time-based progress calculations shall be based on Remaining Duration for each activity.

3.6.3.3 Cost Completion

The earnings for each activity started. Payment will be based on earnings for each in-progress or completed activity. Payment for individual activities will not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

3.6.3.4 Logic Changes

All logic changes pertaining to NTP on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, lag durations, and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

3.6.3.5 Other Changes

Other changes required due to delays in completion of any activity or group

of activities include: 1) delays beyond the Contractor's control, such as strikes and unusual weather. 2) delays encountered due to submittals, Government Activities, deliveries or work stoppages which make re-planning the work necessary. 3) Changes required to correct a schedule which does not represent the actual or planned prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor requests an extension of the contract completion date, or any interim milestone date, the Contractor shall furnish the following for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract: justification, project schedule data, and supporting evidence as the Contracting Officer may deem necessary. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals.

3.7.1 Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, will not be a cause for a time extension to the contract completion date.

3.7.2 Submission Requirements

The Contractor shall submit a justification for each request for a change in the contract completion date of under 2 weeks based upon the most recent schedule update at the time of the NTP or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

a. A list of affected activities, with their associated project schedule activity number.

b. A brief explanation of the causes of the change.

c. An analysis of the overall impact of the changes proposed.

d. A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

3.7.3 Additional Submission Requirements

For any requested time extension of over 2 weeks, the Contracting Officer may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If the NTP is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the Contracting

Officer within 2 weeks of the NTP being issued. The proposed revisions to the schedule will be approved by the Contracting Officer prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, the Contractor shall advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

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SECTION 01330

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SECTION 01330

SUBMITTAL PROCEDURES
09/01; Omaha Update 02/04

PART 1 GENERAL

Attachments: Submittal Register
ENG Form 4025, Transmittal Form

1.1 CONTRACTOR RESPONSIBILITIES

The Contractor is responsible for total management of his work including scheduling, control, and certification of all submittals. The submittal management system provided in these specifications is intended to be a complete system for the Contractor to use to control the quality of materials, equipment and workmanship provided by manufacturers, fabricators, suppliers and subcontractors. The Contractor shall review each submittal for contract compliance. Submittals that comply will be forwarded to the Government. Submittals that do not conform will be returned to the originator to be corrected. The Submittal Register (ENG Form 4288) will be utilized to log and monitor all submittal activities. No construction or installation activities shall be performed prior to required approvals of applicable submittals. The Contractor shall perform a check to assure that all materials and/or equipment have been tested, submitted and approved during the preparatory phase of quality control inspections.

1.2 SUBMITTAL IDENTIFICATION (SD)

Submittals required are identified by SD numbers and titles as follows:

SD-01 Preconstruction Submittals

Tabular lists showing location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.

In addition, the following items are included:

Work plan
Quality control plan
Permits

SD-02 Shop Drawings

Submittals which graphically show relationship of various components of the work, schematic diagrams of systems, details of fabrication, layouts of particular elements, connections, and other relational aspects of the work.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts,

instructions and brochures illustrating size, physical appearance and other characteristics of materials or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

Samples, including both fabricated and unfabricated physical examples of materials, products, and units of work as complete units or as portions of units of work.

Physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged. Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

Calculations, mix designs, analyses or other data pertaining to a part of work.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accordance with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports

Daily checklists

Final acceptance test and operational test procedure

SD-07 Certificates

A document, required of the Contractor, or through the Contractor, from a supplier, installer, manufacturer, or other lower tier Contractor, the purpose of which is to confirm the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verifications of quality.

Statement signed by an official authorized to certify on behalf of the manufacturer of a product, system or material, attesting that the product,

system or material meets specified requirements. The statement must be dated after the award of the contract, must state the Contractor's name and address, must name the project and location, and must list the specific requirements which are being certified.

Confined space entry permits.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and material safety data sheets, if any, concerning impedances, hazards, and safety precautions.

SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

Factory test reports.

SD-10 Operation and Maintenance Data

Data intended to be incorporated in operations and maintenance manuals.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

In addition, the following items are included:

As-built drawings

Special warranties

Posted operating instructions

Training plan

1.3 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.3.1 Government Approved

Governmental approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings." All submittals noted in the technical specifications and Submittal Register as "G-DO" or "G-AO" are subject to Government Approval.

1.3.2 Information Only (FIO)

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above. The Contracting Officer has the

option to review any submittal.

1.3.3 Administrative Submittals

The submittal items listed below are not be included on the Submittal Register (as discussed below). Unless directed otherwise by the Contracting Officer, the following administrative submittals shall be submitted to the Area or Resident (as directed) Office, for acceptance, via a Serial Letter: Quality Control Plans (Section 01451A CONTRACTOR QUALITY CONTROL), Accident Prevention Plans (Section 01525 SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS, Environmental Protection Plans (Section 01355 ENVIRONMENTAL PROTECTION) and other submittals as directed by the Contracting Officer. Format for the Serial Letter shall be as directed by the Area or Resident Office.

1.4 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.5 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the Contracting Officer.

1.6 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

1.7 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) System Manager and each item shall be stamped, signed, and dated by the CQC System Manager indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves;

test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

1.8 SUBMITTAL REGISTER AND ENG FORM 4288 (RMS) SUBMITTAL REGISTER

At the end of this section is a submittal register (submittal form) showing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required. The attached submittal register identifies only the submittal section, type of submittal, description of item submitted, paragraph number related to submittal item (section submittal paragraph if none listed), submittal classification (G), and submittal reviewer identifier (DO or AO). Any submittal without a submittal classification and submittal reviewer identifier is considered to be For Information Only (FIO).

The Government will utilize the Submittal Register information - columns (c) thru (f) of the Submittal Forms furnished with this solicitation - to feed the Government Resident Management System (RMS) Software used for tracking construction submittals. The Submittal Register generated by RMS is referred to as ENG Form 4288 (RMS). The Contractor shall maintain an ENG Form 4288 (RMS) for the project in accordance with the attached ENG Form 4288 (RMS) Instructions. The Contractor will be furnished one (1) set of ENG Forms 4288 (RMS) at the preconstruction conference. Much of the same information contained on the atttached submittal register will be included on the ENG Forms 4288 (RMS) furnished to the Contractor. The Contractor shall complete the appropriate columns as indicated on the attached ENG Form 4288 (RMS) Instructions and return to the Contracting Officer for approval within 20 calendar days after the preconstruction conference. The ENG Form 4288 (RMS)will become a part of the contract after approval. A revised ENG Form 4288(RMS) with ACTIVITY NO. filled in shall be submitted with the completed network analysis system when a network analysis system is a contract requirement. The TRANSMITTAL NUMBER shall be left blank for use later to record the respective transmittal number corresponding to those listed on the transmittal form entitled: "TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE" (ENG Form 4025). The approved ENG Form 4288 (RMS) will become the scheduling document and will be used to control submittals throughout the life of the contract. The ENG Form 4288 (RMS) and the progress schedules shall be coordinated.

1.9 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 20 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals.

1.10 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall

be used for submitting both Goverment approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

1.11 SUBMITTAL PROCEDURES

Submittals shall be made as follows:

1.11.1 Procedures

1.11.1.1 "G-DO" Submittals

All items listed as "G-DO" submittals in the various sections or on the Submittal Register shall be mailed directly to the addressee shown below as directed. For each submittal, a completed information copy of the attached transmittal form shall also be mailed to the Area Engineer and Resident Engineer.

Technical Reviewer

Engineering Division (DO)
Attn: CENWO-ED-DI
U.S. Army Engineer District, Omaha
106 South 15th Street
Omaha, NE 68102-1618

Each required submittal which is in the form of a drawing shall be submitted as seven (7) prints of the drawing. Drawing prints shall be either blue or black line permanent-type prints on a white background or blueprint and shall be sufficiently clear and suitable for making legible copies.

All catalog and descriptive data shall be submitted in seven (7) copies. Catalog cuts and other descriptive data which have more than one model, size, or type or which shows optional equipment shall be clearly marked to show the model, size, or type and all optional equipment which is proposed for approval. Submittals on component items forming a system or that are interrelated shall be submitted at one time as a single submittal in order to demonstrate that the items have been properly coordinated and will function as a unit.

1.11.1.2 "G-AO" and FIO Submittals

Except as noted below, data for all items listed as "G-AO" Submittals in the various sections shall be submitted in five (5) copies to the Area Engineer using the transmittal form. Items not to be submitted in multiples, such as samples and test cylinders, shall be submitted to the Area or Resident Engineer (as directed) accompanied by five (5) copies of the transmittal form.

Except as noted below, data for all items listed as FIO Submittals in the

various sections shall be submitted in five (5) copies to the Area Engineer using the transmittal form. Items not to be submitted in multiples, such as samples and test cylinders, shall be submitted to the Area or Resident Engineer (as directed) accompanied by five (5) copies of the transmittal form. The Government has the option to review any FIO submittal.

1.11.1.3 Certificates of Compliance

Each certificate shall be signed by an official authorized to certify in behalf of the manufacturing company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfactory material, if, after tests are performed on selected samples, the material is found not to meet the specific requirements.

1.11.1.4 Purchase Orders

Copies of purchase orders shall be furnished to the Contracting Officer when the Contractor requests assistance for expediting deliveries of equipment or materials, or when requested by the Contracting Officer for the purpose of quality assurance review. Each purchase order issued by the Contractor or his subcontractors for materials and equipment to be incorporated into the project shall (1) be clearly identified with the applicable DA contract number, (2) carry an identifying number, (3) be in sufficient detail to identify the material being purchased, (4) indicate a definite delivery date, and (5) display the DMS priority rating, if applicable.

1.11.1.5 Operation and Maintenance Instructions and/or Manuals

Where required by various technical sections, operations and maintenance instructions and/or manuals with parts lists included shall be provided by the Contractor in quintuplicate, unless otherwise specified, and shall be assembled in three-ring binders with index and tabbed section divider and having a cover indicating the contents by equipment or system name and project title and shall be submitted for approval to the Contracting Officer 90 days prior to final tests of mechanical and electrical systems, unless otherwise specified. Each operation and maintenance manual shall contain a copy of all warranties and a list of local service representatives required by Section 01200 Warranty of Construction. If field testing requires these copies to be revised, they shall be updated and resubmitted for approval within 10 calendar days after completion of tests. The Operations and Maintenance Instructions and/or Manuals shall be shown as a separate activity on the Contractor prepared construction schedule bar chart or network analysis system. In additon, one reproducible unfolded copy of all wiring and control diagrams and approved system layout drawings shall be submitted with the O&M Manuals.

1.11.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted

deviations.

1.12 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.13 FINAL COPY OF GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated.

1.13.1 "G-DO" Submittals

The drawing print and five (5) sets of all catalog data and descriptive literature and drawing prints will be retained by the Contracting Officer and two (2) sets of catalog data and descriptive literature and drawing prints will be returned to the Contractor.

1.13.2 "G-AO" Submittals

Two (2) copies of "G-AO" submittals for approval will be returned to the Contractor except for samples, test cylinders, and O&M manuals for which two (2) copies of the transmittal form only will be returned to the Contractor.

1.14 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Review by the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

1.15 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following. The stamp shall be affixed and filled out on the back of each ENG Form 4025.

CONTRACTOR

(Firm Name)

_____ Approved

_____ Approved with corrections as noted on submittal data and/or attached sheets(s).

SIGNATURE: _____

TITLE: _____

DATE: _____

INSTRUCTIONS
ENG FORM 4288 (RMS)

1. The Contractor shall utilize the ENG Form 4288 (RMS) generated by the Government Resident Management System (RMS) software for tracking construction submittals. The Government will furnish the Contractor a hard copy of the ENG Form 4288 (RMS) at the preconstruction conference. Listed below are the items included on the ENG Form 4288 (RMS) and parties responsible for completing the information required on the ENG Form 4288 (RMS) submittal register. The subparagraph headings below do not correspond to the Submittal Register column headings included in this solicitation.

a. Activity Number: will be provided by the Contractor from his Network Analysis, if required, and when a network analysis is accepted.

b. Transmittal Number and Item Number: will be provided by the Contractor from ENG Form 4025 for each item.

c. Specification Paragraph Number: will be provided by the Government from the Submittal Register from column entitled "Specification Paragraph Number".

d. Description of Submittal: will be provided by the Government from the Submittal Register from column entitled "Description of Item Submitted".

e. Type of Submittal: will be provided by the Government from the Submittal Register from column entitled "Type of Submittal" or "Description of Item Submitted".

f. Classification: will be provided by the Government from the Submittal Register from column entitled "Classification". Classification will be GA (Government Approval) or FIO (For Information Only).

g. Reviewer-Office Name: will be provided by the Government from the Submittal Register from column entitled "Classification" or "Reviewer".

h. Contractor Schedule Dates: the Contractor will provide schedule dates for

"Submit Needed By" (Date the Contractor expects to submit an item. It is the Contractors responsibility to calculate the lead time needed for the government approval. Note if resubmittal is required it is the Contractors responsibility to make all adjustments necessary to meet the contract completion date.)

"Approval Needed By" (date the Contractor can receive approval and still obtain the material by need date.), and

"Material Needed By" (date that the material is needed at the site. If there is a network analysis it should reflect that date on the analysis.)

i. Contractor Action: Includes the following items: "Code" and "Submit to the Corps". These items will be completed by the Contractor. The action codes will be one of the following:

A - Approved as submitted.
B - Approved, except as noted.

G - Other (specify)

j. Government Action: This item includes a Government Action "Code" and "Date" and is reserved for Government use. The Government reserves the right to review any submittal for contract compliance. Receipt of an Action Code "F - Receipt Acknowledged" or failure of the Contractor to receive an Action Code by the Government, does not mean that the submittal is in compliance with the contract requirements. When used by the Government, the action code will be one of the following:

A - Approved as submitted.
B - Approved except as noted on drawings.
C - Approved, except as noted on drawings. Refer to attached ____ sheet resubmission required.
D - Will be returned by separate correspondence.
E - Disapproved (See Attached).
F - Receipt Acknowledged.
Fx - Receipt acknowledged, does not comply as noted with contract requirements.
G - Other (specify).

2. Reviewer Abbreviation code will be as follows;

G-DO or G-AO - Government Approved
For Information Only - Any submittal without a Government Approved abbreviation code.

INSTRUCTIONS
ENG FORM 4025

1. DATE at the top of form will be the date submitted to the Government which is to be completed by the Contractor.

2. TRANSMITTAL NO. Each new transmittal (i.e. G-DO, G-AO or FIO) shall be numbered consecutively for each specification section in the space provided in "Transmittal No.". This number will be the identifying symbol for each submittal. Example: "15400A-001", "15895A-001" "15895A-002", "16415A-001", etc. For each new submittal or for a resubmittal, the appropriate box must be marked. Resubmittals or supplemental submittals must be designated by their original sequential number followed by an ".1", ".2", etc. for each sequential resubmittal. Example: "15895A-001.1" (previous submittal No. 15895A-001). This will clearly annotate the resubmittal or supplemental submittals as related to the previous submittal.

3. TO: Box will contain the name and address of the office which will review the submittal (as designated by the Contracting Officer).

4. FROM: Box will be the name and address of the Contractor. Contractor is to complete this box.

5. CONTRACT NO. box will contain the Contractors construction contract number (e.g., W9128F-XX-C-XXXX).

6. CHECK ONE box

a. CHECK ONE box (for transmittal/ retransmittal) will be completed by the Contractor with one box marked. If a resubmittal is provided last transmittal number will be added.

b. CHECK ONE box will be completed by the Contractor with one box marked for the submittal type.

7. SPECIFICATION SECTION NO. box will be completed by the Contractor. The number will be the five digit number found in the specifications. No more than one section will be covered with each transmittal. **No more than one section will be covered with each transmittal.**

8. PROJECT TITLE AND LOCATION box will be completed by the Contractor.

9. Column a, will be completed by the Contractor and will contain a different number for each item submitted in that transmittal. **The item numbers will match the item numbers provided by the Government on the ENG Form 4288 (RMS) Submittal Register. Additional items shall only be submitted if requested by or coordinated with the Contracting Officer's Representative as necessary.**

10. Column b, will be completed by the Contractor. The description of each item on this form will match the descriptions provided on the ENG Form 4288 (RMS) Submittal Register. The Contractor shall submit each submittal register item all at once on one transmittal if possible. If a submittal register item can not be submitted all at once Contractor should note that in the remarks box.

11. Column c, will be completed by the Contractor. The information will be

the appropriate submittal description number as described this Section or shown on the submittal register (e.g. SD-01, SD-02, etc.).

12. Column d, will be completed by the Contractor. The number of copies will be determined by the Contractor after review of submittal register for the classification of the item and after review of paragraph: SUBMITTAL PROCEDURES of this Section.

13. Column e, will be completed by the Contractor. The Contractor shall state all applicable paragraph numbers.

14. Column f, will be completed by the Contractor. The Contractor shall state all applicable drawing sheet numbers.

15. Column g, will be completed by the Contractor. The action codes will be one of the following:

A - Approved as submitted.
B - Approved, except as noted.
G - Other (specify)

16. Column h, will be completely by the Contractor. **Any transmittal without a Contractor action code may be returned by the Government without Government action. The Contractor QC must demonstrate that a review has been conducted by the Contractor.** A check shall be placed in this column when a submittal is not in accordance with the plans and specifications also, a written statement to that effect shall be included in the space provided for "Remarks".

17. Column i, is reserved for Government use and may or may not be provided. When used by the Government, the action code will be one of the following:

A - Approved as submitted.
B - Approved except as noted on drawings.
C - Approved, except as noted on drawings. Refer to attached ____ sheet resubmission required.
D - Will be returned by separate correspondence.
E - Disapproved (See Attached).
F - Receipt Acknowledged.
Fx - Receipt acknowledged, does not comply as noted with contract requirements.
G - Other (specify).

18. REMARKS box: **Provide any information related to Variations. Also, provide any and all remarks that explain any deviations in descriptions, item numbers, additional or supplemental submittal items, etc. It is imperative to clearly communicate what is included on the transmittal and these pertinent 'remarks' can facilitate the review of the transmittal.**.

19. Contractor Quality Control Manager must provide name and sign all Eng Form 4025 certifying conformance. **In the space for the name and signature, also include a phone number where the CQC Manager may be reached.**

20. Section II will be completed by the Government. Contractor is not to write in this space.

See reverse side of ENG Form 4025 for additional instructions.

-- End of Section --

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SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Child Development Center, Buckley AFB, Co

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# PARAGRAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		00800	SD-02 Shop Drawings															
			Equipment Room Drawings		G	AO												
		01200	SD-11 Closeout Submittals															
			Equipment Warranty Booklet	1.2.5														
		02300	SD-03 Product Data															
			Utilization of Excavated Materials		G	AO												
			SD-06 Test Reports															
			Testing	3.15														
			SD-07 Certificates															
			Testing	3.15														
		02510	SD-03 Product Data															
			Installation	3.1														
			Waste Water Disposal Method		G	AO												
			SD-06 Test Reports															
			Bacteriological Disinfection		G	AO												
		02531	SD-03 Product Data															
			Pipeline materials	2.1														
		02555	SD-02 Shop Drawings															
			Distribution System	3.4.9	G	AE												
			SD-03 Product Data															
			Distribution System	3.4.9	G	AE												
			SD-07 Certificates															
			Distribution System	3.4.9	G	AO												
			Welding	1.6	G	AO												
			SD-10 Operation and Maintenance															
			Data															

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							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02555	Distribution System	3.4.9	G	AO												
		02556	SD-03 Product Data															
			Materials and Equipment	1.3.2														
			Connections to Existing Lines	3.11														
			Jointing Polyethylene and		G	AO												
			Fiberglass Piping															
			Connection and Abandonment	3.11.1	G	AO												
			Plan															
			SD-06 Test Reports															
			Pressure and Leak Tests	3.12.2	G	AO												
		02560	SD-03 Product Data															
			Plant, Equipment, and Tools	1.9														
			Job Mix Formula	2.1.1	G	AO												
			Mixture Proportions	2.3.1	G	AO												
			SD-06 Test Reports															
			Initial Tests		G	AO												
			Contractor Quality Control	3.2.1	G	AO												
			Contractor Quality Control	3.4.4	G	AO												
			Acceptability of Work	3.2.2	G	AO												
			Acceptability of Work	3.4.5	G	AO												
			SD-07 Certificates															
			Asphalt Cement Binder	2.1.3	G	AO												
			Bituminous Tack and Prime Coat		G	AO												
			SD-08 Manufacturer’s Instructions															
			Manufacturer's Recommendations	3.4.3	G	AO												
		02630	SD-03 Product Data															

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02630	Placing Pipe	3.3														
			SD-07 Certificates															
			Resin Certification	2.1.2														
			Resin Certification	2.1.3														
			Pipeline Testing	3.8														
			Hydrostatic Test on Watertight	2.7														
			Joints															
			Determination of Density															
			Frame and Cover for Gratings	2.3.4														
		02763	SD-03 Product Data															
			Equipment	1.4	G	AO												
			Composition Requirements															
		02791	SD-02 Shop Drawings															
			Shop Drawings	3.1.2.2	G	AE												
			Finished Grade and Underground	3.1.1	G	AE												
			Utilities															
			SD-03 Product Data															
			Synthetic Surfacing	2.2	G	AE												
			Geotextile Fabric	2.3	G	AE												
			Manufacturer's Qualification	1.7	G	AO												
			Site Preparation	3.1	G	AO												
			Temperature Limitation	3.2.1	G	AO												
			Adhesive	2.2.9	G	AO												
			Color	2.2.5	G	AE												
			SD-04 Samples															
			Synthetic Surfacing	2.2	G	AE												

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02791	SD-06 Test Reports															
			Percolation Test	3.1.4	G	AO												
			Recycled Plastic	2.4	G	AO												
			Synthetic Surfacing	2.2	G	AO												
			SD-07 Certificates															
			Materials	2.1	G	AO												
			Manufacturer's Qualification	1.7	G	AO												
			Manufacturer's Representative	1.11	G	AO												
			Installer's Qualification	1.8	G	AO												
			Substitution	3.1.5	G	AO												
			Child Safety and Accessibility	3.4.1	G	AO												
			Evaluation															
			SD-10 Operation and Maintenance															
			Data															
			Maintenance Instruction	3.4.3	G	AO												
		02812	SD-01 Preconstruction Submittals															
			Design Analysis and Calculations	1.6.6	G	AO												
			Framed Instructions	3.3	G	AO												
			Field Training	3.4	G	AO												
			SD-02 Shop Drawings															
			Irrigation (Sprinkler) System	2.1	G	AO												
			SD-03 Product Data															
			Irrigation (Sprinkler) System	2.1	G	AO												
			SD-10 Operation and Maintenance															
			Data															
			Irrigation (Sprinkler) System	2.1	G	AO												

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02812	Zone Operation Schedule	1.7.1	G	AO												
			SD-11 Closeout Submittals															
			Spare Parts	3.5	G	AO												
		02821	SD-07 Certificates															
			Chain Link Fence	2.1.1														
		02840	SD-02 Shop Drawings															
			Installation	3.1	G	AO												
			Equipment	3.1	G	AO												
			Electrical Work	2.2	G	AO												
			SD-03 Product Data															
			Vehicle Barriers	1.3														
			Spare Parts	1.6														
			SD-06 Test Reports															
			Field Testing	3.5														
			SD-10 Operation and Maintenance															
			Data															
			Vehicle Barriers	1.3	G	AO												
			Operating and Maintenance	3.6	G	AO												
			Instructions															
		02882	SD-02 Shop Drawings															
			Configuration	2.2.1	G	AE												
			Shop Drawings	3.1.2.2	G	AE												
			Fall Height	3.2.9	G	AE												
			Finished Grade and Underground	3.1.1	G	AE												
			Utilities															
			SD-03 Product Data															

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02882	Equipment	2.2	G	AE												
			Equipment Identification	1.6	G	AO												
			Delivery, Storage and Handling	1.5	G	AO												
			Manufacturer Qualification	1.10	G	AO												
			Spare Parts	3.4.2	G	AO												
			Materials	2.1	G	AO												
			SD-04 Samples															
			Color	2.1.6	G	AO												
			SD-06 Test Reports															
			Recycled Plastic	2.1.4	G	AO												
			SD-07 Certificates															
			Materials	2.1	G	AO												
			Manufacturer Qualification	1.10	G	AO												
			Installer Qualification	1.11	G	AO												
			Manufacturer's Representative	1.14	G	AO												
			Substitution	2.2.2	G	AO												
			Play Event Modification	3.2.1	G	AO												
			Child Safety and Accessibility	3.4.1	G	AO												
			Evaluation															
			SD-10 Operation and Maintenance															
			Data															
			Maintenance Instruction	3.4.3	G	AO												
		02921	SD-03 Product Data															
			Equipment	3.1.3														
			Surface Erosion Control Material	2.6	G	AO												
			Seed Establishment Period	3.8														

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02921	Maintenance Record	3.8.3.4													
			SD-06 Test Reports														
			Equipment Calibration	3.1.3													
			Soil Test	3.1.4													
			SD-07 Certificates														
			Seed	2.1	G AO												
			Fertilizer	2.3.1	G AO												
			Organic Material		G AO												
			Soil Conditioner														
			Mulch	2.4	G AO												
			Asphalt Adhesive		G AO												
		02922	SD-03 Product Data														
			Equipment	3.1.3													
			Chemical Treatment Material	1.4.3.2													
			Delivery	1.4.1													
			Finished Grade and Topsoil	3.2.1													
			Topsoil	2.2													
			Quantity Check	3.5													
			Sod Establishment Period	3.8													
			Maintenance Record	3.8.3.4													
			Application of Pesticide														
			SD-06 Test Reports														
			Equipment Calibration	3.1.3													
			Soil Test	3.1.4													
			SD-07 Certificates														
			Sod	2.1													

SUBMITTAL REGISTER

CONTRACT NO.

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		02922	Topsoil	2.2														
			Organic Material															
			Soil Conditioner															
		02930	SD-03 Product Data															
			Geotextile	2.5	G	AO												
			Chemical Treatment Material	1.4.3.2	G	AO												
			Delivery	1.4.1														
			Maintenance Record	3.8.2.6														
			SD-06 Test Reports															
			Soil Test	3.1.4.2														
			Percolation Test	3.1.4.1														
			SD-07 Certificates															
			Plant Material	2.1														
			Fertilizer	2.3.1														
			Organic Material	2.3.2														
			Soil Conditioner	2.3.3														
			Organic Mulch	2.4.2														
			Mycorrhizal Fungi Inoculum	2.9														
		02935	SD-03 Product Data															
			Chemical Treatment Material	1.3.3														
			Work Plan and Schedule		G	AO												
			Delivery Schedule	1.3.1														
			Maintenance Record	3.6.4														
			SD-06 Test Reports															
			Soil Tests	3.1														
			Percolation Test															

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		02935	SD-07 Certificates															
			pH Adjuster															
			Fertilizer	2.1.1														
			Mulch	2.2														
			Pesticide	2.4														
		03100	SD-02 Shop Drawings															
			Formwork	3.1.1														
			SD-03 Product Data															
			Design	1.3														
			Form Materials	2.1														
			Form Releasing Agents	2.1.6														
		03150	SD-02 Shop Drawings															
			Waterstops	2.4														
			SD-03 Product Data															
			Preformed Expansion Joint Filler	2.2														
			Sealant	2.3														
			Waterstops	2.4														
			SD-04 Samples															
			Lubricant for Preformed	2.3.2														
			Compression Seals															
			Field-Molded Type	2.3.3														
			Non-metallic Materials	2.4.3														
			SD-07 Certificates															
			Preformed Expansion Joint Filler	2.2														
			Sealant	2.3														
			Waterstops	2.4														

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		03200	SD-02 Shop Drawings															
			Reinforcement	3.1	G	AE												
			SD-03 Product Data															
			Welding	1.3	G	AE												
			SD-07 Certificates															
			Reinforcing Steel	2.1														
		03300	SD-03 Product Data															
			Mixture Proportions	1.7	G	AE												
			SD-04 Samples															
			Surface Retarder	2.3.5														
			SD-06 Test Reports															
			Testing and Inspection for	3.13	G	AE												
			Contractor Quality Control															
			SD-07 Certificates															
			Qualifications	1.4														
			Regulatory Requirements															
			Local Materials															
		04200	SD-02 Shop Drawings															
			Structural Masonry		G	AE												
			SD-03 Product Data															
			Concrete Masonry Units		G	AO												
			Cold Weather Installation	3.1.2	G	AO												
			SD-04 Samples															
			Concrete Masonry Units (CMU)	2.2	G	AE												
			Stone Items	2.4	G	AE												

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		04200	Anchors, Ties, and Bar	2.8														
			Positioners															
			Joint Reinforcement	2.9	G AO													
			SD-05 Design Data															
			Pre-mixed Mortar	2.5.4	G AO													
			Unit Strength Method		G AO													
			SD-06 Test Reports															
			Efflorescence Test	3.11.3														
			Field Testing of Mortar	3.11.1	G AO													
			Field Testing of Grout	3.11.2	G AO													
			Prism tests	3.11.4	G AO													
			SD-07 Certificates															
			Concrete Masonry Units (CMU)	2.2														
			Anchors, Ties, and Bar	2.8														
			Positioners															
			Joint Reinforcement	2.9														
			Reinforcing Steel Bars and Rods	2.10														
			Mortar Coloring	2.5.2														
			Precast Concrete Items	2.3														
			Admixtures for Masonry Mortar	2.5.1														
			Admixtures for Grout	2.7.1														
			Regulatory Requirements															
			Local Materials															
			SD-08 Manufacturer's Instructions															
			Masonry Cement	2.5.3														
		04810	SD-02 Shop Drawings															

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		04810	Detail Drawings	1.6	G	AE												
			SD-04 Samples															
			Expansion Joint Materials															
			Concrete Masonry Units		G	AE												
			Sample Panel	1.3	G	AE												
			SD-06 Test Reports															
			Calculations	3.1	G	AE												
			SD-07 Certificates															
			Concrete Masonry Unit	2.1.1														
			Joint Reinforcement	2.3														
			Expansion Joint Materials															
			Insulation	2.5														
			Exterior Sheathing	2.7														
			Moisture Barrier	2.8.1														
			Vapor Retarder	2.8.2														
			Veneer Anchors	2.9														
			Welding	2.10.2														
			Regulatory Requirements															
		05090	SD-03 Product Data															
			Welding Procedure Qualifications	1.5	G	AO												
			Welder, Welding Operator, and	1.6														
			Tacker Qualification															
			Inspector Qualification	1.7														
			Previous Qualifications	1.5.1														
			Prequalified Procedures	1.5.2														
			SD-06 Test Reports															

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		05090	Quality Control	3.2	G	AO												
		05120	SD-02 Shop Drawings															
			Fabrication drawings	1.6.1	G	AE												
			SD-03 Product Data															
			Shop primer	2.4														
			Load indicator washers	2.2.4														
			Load indicator bolts	2.2.5														
			SD-06 Test Reports															
			Class B coating	2.4														
			Bolts, nuts, and washers	2.2														
			SD-07 Certificates															
			Steel	2.1														
			Bolts, nuts, and washers	2.2														
			Shop primer	2.4														
			Welding electrodes and rods	2.3.1														
			Nonshrink grout	2.3.2														
			Galvanizing	2.5														
			AISC Quality Certification	1.5														
			Welding procedures and	1.6.2.2														
			qualifications															
			Regulatory Requirements															
		05210	SD-02 Shop Drawings															
			Steel Joists	1.3	G	AE												
			SD-07 Certificates															
			Steel Joists	1.3														
		05310	SD-02 Shop Drawings															

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		05310	Fabrication Drawings	1.3.5	G	AE												
			SD-03 Product Data															
			Deck Units	2.3.1														
			Sound Absorbing Material															
			Accessories	2.2														
			Mechanical Fasteners															
			SD-04 Samples															
			Deck Units	2.3.1														
			Accessories	2.2														
			SD-05 Design Data															
			Deck Units	2.3.1														
			SD-07 Certificates															
			Deck Units	2.3.1														
			Accessories	2.2														
			Qualification of Welders	1.3.3														
			Fire Safety	1.3.4.1														
			Wind Storm Resistance	1.3.4.2														
		05400	SD-02 Shop Drawings															
			Framing Components	1.6.1	G	AE												
			SD-03 Product Data															
			studs,joists	2.1														
			SD-05 Design Data															
			Metal framing calculations	1.6.2	G	AO												
			SD-07 Certificates															
			Load-bearing cold-formed metal	1.4														
			framing															

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		05400	Welds	3.1.1														
		05500	SD-02 Shop Drawings															
			Miscellaneous Metal Items	1.6	G AE													
			SD-04 Samples															
			Miscellaneous Metal Items	1.6	G AE													
		06100	SD-07 Certificates															
			Grading and Marking	2.1.1														
			Insulation	2.3														
		06410	SD-02 Shop Drawings															
			Shop Drawings	1.5	G AE													
			Installation	3.1	G AE													
			SD-03 Product Data															
			Wood Materials	2.1														
			Wood Finishes	2.9														
			Finish Schedule	2.11.7.3														
			SD-04 Samples															
			Plastic Laminates	2.3	G AE													
			Cabinet Hardware	2.6	G AE													
			Hardwood															
			SD-07 Certificates															
			Quality Assurance	1.4														
			Laminate Clad Casework	3.1														
			Local Materials															
		06650	SD-02 Shop Drawings															
			Shop Drawings	1.7	G AE													
			Installation	3.2	G AE													

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		06650	SD-03 Product Data															
			Solid polymer material	2.1														
			Qualifications	1.6														
			Fabrications	2.3														
			SD-04 Samples															
			Material	2.1	G	AE												
			SD-06 Test Reports															
			Solid polymer material	2.1														
			SD-07 Certificates															
			Fabrications	2.3														
			Qualifications	1.6														
			SD-10 Operation and Maintenance															
			Data															
			Clean-up	3.3	G	AO												
		07416	SD-02 Shop Drawings															
			Structural Standing Seam Metal		G	AO												
			Roof System															
			SD-03 Product Data															
			Design Analysis		G	AO												
			Qualifications		G	AO												
			SD-04 Samples															
			Accessories	2.3	G	AO												
			Roof Panels	2.1	G	AO												
			Factory Color Finish	2.6	G	AO												
			Fasteners	2.4	G	AO												
			Insulation	2.7	G	AO												

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		07416	Gaskets and Insulating	2.10	G	AO												
			Compounds															
			Sealant	2.9	G	AO												
			Concealed Anchor Clips	2.2	G	AO												
			Subpurlins	2.5	G	AO												
			EPDM Rubber Boots	2.12	G	AO												
			Ice and Water Shield		G	AO												
			SD-06 Test Reports															
			Test Report for Uplift Resistance		G	AO												
			of the SSSMR															
			SD-07 Certificates															
			Structural Standing Seam Metal		G	AO												
			Roof System															
			Insulation	2.7														
		07600	SD-02 Shop Drawings															
			Base flashing	3.1.9	G	AE												
			Counterflashing	3.1.10	G	AE												
			Flashing at roof penetrations	3.1.17	G	AE												
			Open valley flashing	3.1.14	G	AE												
			Eave and rake flashing		G	AE												
			SD-11 Closeout Submittals															
			Quality Control Plan		G	AO												
		07840	SD-02 Shop Drawings															
			Firestopping Materials	2.1	G	AE												
			SD-07 Certificates															
			Firestopping Materials	2.1	G	AO												

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		07840	Installer Qualifications	1.5	G	AO												
			Inspection	3.3	G	AO												
		07920	SD-03 Product Data															
			Sealants	2.1	G	AE												
			Primers	2.2	G	AE												
			Bond breakers	2.3														
			Backstops	2.4														
			SD-04 Samples															
			Samples		G	AE												
			SD-07 Certificates															
			Sealant	3.3.6														
		08110	SD-02 Shop Drawings															
			Doors	2.1	G	G												
			Doors	2.1	G	G												
			Frames	2.6	G	G												
			Frames	2.6	G	G												
			Accessories	2.4														
			SD-03 Product Data															
			Doors	2.1	G	AE												
			Frames	2.6	G	AE												
			Accessories	2.4														
			SD-04 Samples															
			Factory-applied enamel finish	2.9.3	G	AE												
			Local Materials															
		08120	SD-02 Shop Drawings															
			Doors and frames	2.1	G	AE												

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		08120	SD-04 Samples															
			Finishes		G	AE												
			SD-07 Certificates															
			Local Materials															
			SD-08 Manufacturer's Instructions															
			Doors and frames	2.1														
		08210	SD-02 Shop Drawings															
			Doors	2.1	G	AE												
			SD-03 Product Data															
			Doors	2.1	G	AE												
			Accessories	2.2														
			Water-resistant sealer	2.3.6														
			warranty	1.4														
			Fire resistance rating	2.1.2	G	AE												
			Adhesives															
			SD-04 Samples															
			Doors	2.1														
			Door finish colors		G	AE												
			SD-06 Test Reports															
			Split resistance	2.4														
			Cycle-slam	2.4														
			Hinge loading resistance	2.4														
			SD-07 Certificates															
			Local Materials															
		08520	SD-02 Shop Drawings															
			Aluminum Windows		G	AE												

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		08520	Insect Screens	2.3	G	AE												
			SD-03 Product Data															
			Aluminum Windows		G	AE												
			SD-04 Samples															
			Aluminum Windows		G	AE												
			SD-06 Test Reports															
			Aluminum Windows															
			SD-07 Certificates															
			Aluminum Windows															
		08710	SD-03 Product Data															
			Hardware and Accessories		G	AE												
			SD-02 Shop Drawings															
			Hardware Schedule		G	AE												
			Keying System		G	AE												
			SD-11 Closeout Submittals															
			key bitting															
			SD-07 Certificates															
			Hardware and Accessories		G	AE												
		08800	SD-02 Shop Drawings															
			Installation															
			SD-03 Product Data															
			Insulating Glass	1.6.1	G	AE												
			Fire Glass		G	AE												
			Glazing Accessories	1.3														
			SD-04 Samples															
			Insulating Glass	1.6.1	G	AE												

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		08800	Fire Glass		G	AE												
			SD-07 Certificates															
			Insulating Glass	1.6.1														
			Fire Glass		G	AE												
			SD-08 Manufacturer's Instructions															
			Setting and sealing materials	2.3														
			Glass setting	3.2														
		08950	SD-02 Shop Drawings															
			Wall Systems		G	AE												
			SD-06 Test Reports															
			Wall Framing Systems		G	AE												
			SD-04 Samples															
			Sample Panels		G	AE												
		09100	SD-02 Shop Drawings															
			Metal support systems	2.1	G	AE												
		09225	SD-02 Shop Drawings															
			Lathing and Stucco		G	AE												
			SD-03 Product Data															
			Materials	1.3	G	AE												
			SD-04 Samples															
			Colored Stucco Finish Coat	2.2	G	AE												
			SD-07 Certificates															
			Local Materials															
		09250	SD-03 Product Data															
			Cementitious backer units	2.1.3														
			Impact Resistant Gypsum Board	2.1.2														

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		09250	Accessories	2.1.7														
			Adhesives															
			SD-07 Certificates															
			Asbestos Free Materials	2.1	G	AO												
			Regulatory Requirements															
		09310	SD-03 Product Data															
			Tile	2.1														
			Setting-Bed	2.2														
			Mortar, Grout, and Adhesive	2.4														
			SD-04 Samples															
			Tile	2.1	G	AE												
			Accessories		G	AE												
			Marble Thresholds	2.5	G	AE												
			SD-07 Certificates															
			Tile	2.1														
			Mortar, Grout, and Adhesive	2.4														
			Regulatory Requirements															
		09510	SD-02 Shop Drawings															
			Approved Detail Drawings	1.3	G	AO												
			SD-03 Product Data															
			Acoustical Ceiling Systems															
			SD-04 Samples															
			Acoustical Units	2.1	G	AO												
			SD-06 Test Reports															
			Fire Resistive Ceilings															

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		09510	Ceiling Attenuation Class and	1.3.1														
			Test															
			SD-07 Certificates															
			Acoustical Units	2.1														
		09570	SD-02 Shop Drawings															
			Approved Detail Drawings															
			SD-03 Product Data															
			Wood Ceiling Systems															
			SD-04 Samples															
			Wood Slat		G	AO												
		09650	SD-02 Shop Drawings															
			Resilient Flooring and	2.9	G	AO												
			Accessories															
			SD-03 Product Data															
			Resilient Flooring and	2.9														
			Accessories															
			Adhesives	2.5														
			SD-04 Samples															
			Resilient Flooring and	2.9	G	AE												
			Accessories															
			SD-06 Test Reports															
			Moisture, Alkalinity and Bond	3.3	G	AO												
			Tests															
			SD-07 Certificates															
			Regulatory Requirements															
			SD-08 Manufacturer's Instructions															

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		09650	Surface Preparation	3.2														
			Installation	3.1														
			SD-10 Operation and Maintenance															
			Data															
			Resilient Flooring and	2.9														
			Accessories															
		09680	SD-02 Shop Drawings															
			Installation	3.4	G	AO												
			Molding		G	AO												
			SD-03 Product Data															
			Carpet	2.1														
			Surface Preparation	3.1														
			Installation	3.4														
			Regulatory Requirements	1.3														
			SD-04 Samples															
			Carpet	2.1	G	AE												
			SD-06 Test Reports															
			Moisture and Alkalinity Tests	3.2														
			SD-07 Certificates															
			Carpet	2.1														
			Regulatory Requirements	1.3														
			SD-10 Operation and Maintenance															
			Data															
			Carpet	2.1														
			Cleaning and Protection	3.5														
		09900	SD-02 Shop Drawings															

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		09900	Piping identification															
			stencil															
			SD-03 Product Data															
			Coating	2.1														
			Manufacturer's Technical Data	2.1														
			Sheets															
			SD-04 Samples															
			Color	1.9	G	AE												
			SD-07 Certificates															
			Applicator's qualifications	1.3														
			Qualification Testing	1.4.1.2														
			Coating	2.1														
			SD-08 Manufacturer’s Instructions															
			Application instructions															
			Mixing	3.6.2														
			Manufacturer's Material Safety	1.7.2														
			Data Sheets															
			SD-10 Operation and Maintenance															
			Data															
			Coatings	2.1														
		10153	SD-02 Shop Drawings															
			Installation	3.1	G	AO												
			SD-03 Product Data															
			Toilet Partition System	1.3														
			SD-04 Samples															
			Colors and Finishes	2.3	G	AE												

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		10201	SD-02 Shop Drawings															
			Wall louvers	2.2	G	AE												
			SD-04 Samples															
			Wall louvers	2.2	G	AE												
		10260	SD-02 Shop Drawings															
			Corner Guards	2.2	G	AO												
			Wall Guards (Bumper Guards)		G	AO												
			Wall Covering/Panels		G	AO												
			SD-03 Product Data															
			Corner Guards	2.2														
			Wall Guards (Bumper Guards)															
			Wall Covering/Panels															
			SD-04 Samples															
			Finish	2.6	G	AE												
			SD-06 Test Reports															
			Corner Guards	2.2														
			Wall Guards (Bumper Guards)															
			Wall Covering/Panels															
			SD-07 Certificates															
			Corner Guards	2.2														
			Wall Guards (Bumper Guards)															
			Wall Covering/Panels															
		10440	SD-02 Shop Drawings															
			Detail Drawings		G	AO												
			SD-03 Product Data															
			Installation	3.1														

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		10440	SD-04 Samples															
			Interior Signage	1.2	G	AO												
			SD-10 Operation and Maintenance															
			Data															
			Approved Manufacturer's															
			Instructions															
			Protection and Cleaning	3.1.2														
		10505	SD-02 Shop Drawings															
			Types															
			Location															
			Installation															
			SD-03 Product Data															
			Material															
			Finish															
			components															
			Assembly															
			SD-04 Samples															
			Color chips	1.4.1	G	AE												
		10800	SD-03 Product Data															
			Finishes	2.1.2														
			Accessory Items	2.2														
			SD-04 Samples															
			Finishes	2.1.2	G	AO												
			Accessory Items	2.2	G	AO												
			SD-07 Certificates															
			Accessory Items	2.2														

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		11250	SD-02 Shop Drawings															
			Installation		G	AE												
			SD-03 Product Data															
			Softening Equipment		G	AE												
			Spare Parts		G	AO												
			Field Instructions	3.3.2	G	AO												
			SD-06 Test Reports															
			Softening Equipment		G	AO												
			Piping	3.2.2	G	AO												
			SD-10 Operation and Maintenance															
			Data															
			Softening Equipment		G	AO												
		11400	SD-02 Shop Drawings															
			Food Service Equipment	2.1.6	G	AE												
			Installation	3.1	G	AE												
			SD-03 Product Data															
			Food Service Equipment	2.1.6	G	AE												
			SD-06 Test Reports															
			Testing	3.3														
			SD-10 Operation and Maintenance															
			Data															
			Food Service Equipment	2.1.6	G	AO												
		13100	SD-02 Shop Drawings															
			Drawings		G	AO												
			SD-07 Certificates															
			Materials	2.1	G	AO												

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		13110	SD-02 Shop Drawings															
			Drawings	1.3.9	G	AO												
			Contractor's Modifications	1.3.2	G	AO												
			SD-03 Product Data															
			Equipment		G	AO												
			Spare Parts	3.9														
			SD-06 Test Reports															
			Tests and Measurements	3.5	G	AO												
			Contractor's Modifications	1.3.2	G	AO												
			SD-07 Certificates															
			Cathodic Protection System		G	AO												
			Services of 'Corrosion Expert'	1.3.1	G	AO												
			SD-10 Operation and Maintenance															
			Data															
			Cathodic Protection System		G	AO												
			Training Course	3.6														
		13851	SD-02 Shop Drawings															
			Fire Alarm Reporting System	1.4.1	G	AO												
			SD-03 Product Data															
			Storage Batteries	2.2	G	AO												
			Voltage Drop		G	AO												
			Special Tools and Spare Parts	2.7.4														
			Technical Data and Computer	1.5	G	AO												
			Software															
			Training	3.5	G	AO												
			Testing	3.4	G	AO												

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		13851	SD-06 Test Reports															
			Testing	3.4	G	AO												
			SD-07 Certificates															
			Equipment		G	AO												
			Qualifications	1.3.7	G	AO												
			SD-10 Operation and Maintenance															
			Data															
			Technical Data and Computer	1.5	G	AO												
			Software															
		13930	SD-02 Shop Drawings															
			Shop Drawings	1.12	G	AE												
			As-Built Drawings	3.11	G	AE												
			SD-03 Product Data															
			Sway Bracing	3.4.1	G	AE												
			Materials and Equipment	2.3	G	AE												
			Hydraulic Calculations	1.7	G	AE												
			Spare Parts	1.11														
			Preliminary Tests	3.10	G	AO												
			Final Acceptance Test	3.11	G	AO												
			On-site Training	3.12	G	AO												
			Fire Protection Specialist	1.8	G	AE												
			Sprinkler System Installer	1.9	G	AE												
			SD-06 Test Reports															
			Preliminary Test Report	3.11	G	AE												
			Final Acceptance Test Report	3.11	G	AE												
			SD-07 Certificates															

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		13930	Inspection by Fire Protection	3.3	G	AE												
			Specialist															
			SD-10 Operation and Maintenance															
			Data															
			Operating and Maintenance	3.12	G	AO												
			Instructions															
		13965	SD-02 Shop Drawings															
			Wet Chemical Fire Extinguishing		G	AE												
			System															
			SD-03 Product Data															
			Similar Services	1.3.5														
			Wet Chemical Fire Extinguishing		G	AE												
			System															
			Preliminary Tests	3.2	G	AO												
			Final Acceptance Tests	3.3	G	AO												
			Field Training	3.4														
			SD-06 Test Reports															
			Preliminary Tests	3.2														
			Final Acceptance Tests	3.3														
			SD-07 Certificates															
			Installation Technician	1.3.4	G	AO												
			Installation Drawings	1.3.3	G	AE												
			SD-10 Operation and Maintenance															
			Data															
			Wet Chemical Fire Extinguishing															
			System															

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		15080	SD-03 Product Data															
			General Materials	2.1	G	AO												
			SD-04 Samples															
			Thermal Insulation Materials		G	AO												
		15181	SD-03 Product Data															
			Materials and Equipment	2.1	G	AE												
			Water Treatment Systems	2.12	G	AO												
			Spare Parts	1.6.3														
			Qualifications	1.3														
			Field Tests	3.3	G	AO												
			Demonstrations	3.4	G	AO												
			Verification of Dimensions	1.6.1	G	AO												
			SD-06 Test Reports															
			Field Tests	3.3	G	AO												
			One-Year Inspection		G	AO												
			SD-07 Certificates															
			Service Organization	2.1														
			SD-10 Operation and Maintenance															
			Data															
			Operation Manuals	3.4	G	AO												
			Maintenance Manuals	3.4	G	AO												
			Water Treatment Systems	2.12	G	AO												
		15182	SD-02 Shop Drawings															
			Refrigerant Piping System	2.3	G	AO												
			SD-03 Product Data															
			Refrigerant Piping System	2.3														

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		15182	Spare Parts	1.6.3														
			Qualifications	1.3	G	AO												
			Refrigerant Piping Tests	3.3	G	AO												
			Demonstrations	3.4	G	AO												
			Verification of Dimensions	1.6.1														
			SD-06 Test Reports															
			Refrigerant Piping Tests	3.3														
			SD-07 Certificates															
			Service Organization	2.1														
			SD-10 Operation and Maintenance															
			Data															
			Maintenance	1.7														
			Operation and Maintenance	3.4														
			Manuals															
		15190	SD-02 Shop Drawings															
			Gas Piping System	3.2	G	AE												
			SD-03 Product Data															
			Welding	1.3.1	G	AO												
			SD-06 Test Reports															
			Testing	3.15	G	AO												
			Pressure Tests	3.15.1	G	AO												
			Test With Gas	3.15.3	G	AO												
		15400	SD-02 Shop Drawings															
			Plumbing System	3.8.1	G	AO												
			Electrical Work	1.4	G	AO												
			SD-03 Product Data															

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		15400	Welding	1.5.1														
			Plumbing Fixture Schedule	3.9	G	AO												
			Vibration-Absorbing Features		G	AO												
			Plumbing System	3.8.1														
			SD-06 Test Reports															
			Tests, Flushing and Disinfection	3.8	G	AO												
			Test of Backflow Prevention	3.8.1.1	G	AO												
			Assemblies															
			SD-07 Certificates															
			Materials and Equipment	1.3														
			Bolts	2.1.1														
			SD-10 Operation and Maintenance															
			Data															
			Plumbing System	3.8.1	G	AO												
		15569	SD-02 Shop Drawings															
			Piping Installation	3.2	G	AE												
			Installation	3.2.4.3	G	AE												
			Installation	3.2.7	G	AE												
			SD-03 Product Data															
			Materials and Equipment	1.3.1	G	AO												
			Spare Parts	1.3.7	G	AO												
			Water Treatment System	2.13	G	AE												
			Heating System Tests	3.7	G	AO												
			Fuel System Tests	3.9	G	AO												
			Welding	1.3.6	G	AO												
			Qualifications	3.7	G	AO												

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		15569	Field Instructions	3.10	G	AO												
			Tests	3.3	G	AO												
			SD-06 Test Reports															
			Heating System Tests	3.7	G	AO												
			Fuel System Tests	3.9	G	AO												
			Water Treatment Testing	3.7.1	G	AO												
			SD-07 Certificates															
			Bolts	2.9.6.3	G	AO												
			Continuous Emissions Monitoring		G	AO												
			SD-10 Operation and Maintenance															
			Data															
			Operation and Maintenance	3.10	G	AO												
			Instructions															
			Water Treatment System	2.13	G	AO												
		15620	SD-02 Shop Drawings															
			Drawings		G	AE												
			Installation	3.1	G	AE												
			SD-03 Product Data															
			Refrigeration System	3.1.1	G	AE												
			Spare Parts															
			Posted Instructions	3.5	G	AO												
			Verification of Dimensions	1.5.1	G	AO												
			Manufacturer's Multi-Year	1.6														
			Compressor Warranty															
			Factory Tests	2.8	G	AO												
			System Performance Tests	3.1.1.2	G	AO												

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		15620	System Performance Tests	3.4	G	AO												
			Demonstrations	3.5	G	AO												
			SD-06 Test Reports															
			Factory Tests	2.8	G	AO												
			System Performance Tests	3.1.1.2	G	AO												
			System Performance Tests	3.4	G	AO												
			SD-07 Certificates															
			Refrigeration System	3.1.1														
			Service Organization	2.1	G	AO												
			SD-10 Operation and Maintenance															
			Data															
			Operation Manuals		G	AO												
			Maintenance Manuals	3.5	G	AO												
		15700	SD-02 Shop Drawings															
			Drawings		G	AE												
			SD-03 Product Data															
			Unitary Equipment		G	AE												
			Spare Parts Data															
			Posted Instructions	3.5	G	AO												
			Verification of Dimensions	1.5.1														
			System Performance Tests	3.4	G	AO												
			Demonstrations	3.5	G	AO												
			SD-06 Test Reports															
			Refrigerant Tests, Charging, and	3.3	G	AO												
			Start-Up															
			System Performance Tests	3.4	G	AO												

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		15700	SD-07 Certificates															
			Unitary Equipment		G	AE												
			Service Organization	2.1	G	AO												
			SD-10 Operation and Maintenance															
			Data															
			Operation Manuals		G	AO												
			Maintenance Manuals	3.5	G	AO												
		15895	SD-02 Shop Drawings															
			Drawings	3.1.9	G	AE												
			Installation	3.1	G	AE												
			SD-03 Product Data															
			Components and Equipment	2.1														
			Test Procedures		G	AO												
			Welding Procedures	3.1.1.1	G	AO												
			Diagrams	3.1	G	AO												
			Manufacturer's Experience	2.1														
			Welded Joints	3.1.1.1														
			Performance Tests	3.7	G	AO												
			Field Training	3.9	G	AO												
			SD-06 Test Reports															
			Performance Tests	3.7	G	AO												
			Testing, Adjusting, and Balancing	3.6	G	AO												
			SD-07 Certificates															
			Bolts	2.5.2.2														
			SD-10 Operation and Maintenance															
			Data															

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		15895	Operating and Maintenance	3.9	G	AO												
			Instructions															
		15951	SD-02 Shop Drawings															
			HVAC Control System	3.1.1	G	AE												
			SD-03 Product Data															
			Service Organizations	1.7.2														
			Equipment Compliance Booklet	1.6														
			Commissioning Procedures	3.4														
			Performance Verification Test	1.6														
			Procedures															
			Training	3.6	G	AO												
			SD-06 Test Reports															
			Commissioning Report	3.6.2														
			Performance Verification Test	3.5.3	G	AO												
			SD-07 Certificates															
			Air Storage Tank															
			SD-10 Operation and Maintenance															
			Data															
			Operation Manual	1.5	G	AO												
			Maintenance and Repair Manual	1.6	G	AO												
		15990	SD-02 Shop Drawings															
			TAB Schematic Drawings and	3.3	G	AO												
			Report Forms															
			SD-03 Product Data															
			TAB Related HVAC Submittals	3.2	G	AO												
			TAB Procedures	3.5.1	G	AO												

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		15990	Calibration	1.4	G	AO												
			Systems Readiness Check	3.5.2	G	AO												
			TAB Execution	3.5.1	G	AO												
			TAB Verification	3.5.4	G	AO												
			SD-06 Test Reports															
			Design Review Report	3.1	G	AO												
			Systems Readiness Check	3.5.2	G	AO												
			TAB Report	3.5.3	G	AO												
			TAB Verification Report	3.5.4	G	AO												
			SD-07 Certificates															
			Ductwork Leak Testing	3.4	G	AO												
			TAB Firm	1.5.1	G	AO												
			TAB Specialist	1.5.2	G	AO												
		15995	SD-03 Product Data															
			Commissioning Team	3.1	G	AO												
			Tests	3.2	G	AO												
			Pre-Commissioning Checks	3.2.1	G	AO												
			SD-06 Test Reports															
			Test Reports	3.2	G	AO												
		16261	SD-02 Shop Drawings															
			Schematic diagrams	1.5.1	G	AO												
			Interconnecting diagrams	1.5.2	G	AO												
			Installation drawings	1.5.3	G	AO												
			SD-03 Product Data															
			Variable frequency drives	2.1	G	AO												
			Wires and cables	2.3	G	AO												

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		16261	Equipment schedule	1.5.4	G	AO												
			SD-06 Test Reports															
			VFD Test	3.2.1	G	AO												
			Performance Verification Tests	3.2.2	G	AO												
			Endurance Test	3.2.3	G	AO												
			SD-08 Manufacturer's Instructions															
			Installation instructions	1.5.5														
			SD-09 Manufacturer's Field															
			Reports															
			VFD Factory Test Plan	2.5.1	G	AO												
			Factory test results	1.5.6	G	AO												
			SD-10 Operation and Maintenance															
			Data															
			Variable frequency drives	2.1	G	AO												
		16375	SD-02 Shop Drawings															
			Electrical Distribution System	3.10.3	G	AO												
			As-Built Drawings		G	AO												
			SD-03 Product Data															
			Fault Current Analysis	2.18.4	G	AO												
			Protective Device	2.18	G	AO												
			Coordination Study	2.18.5	G	AO												
			Nameplates	2.2	G	AO												
			Material and Equipment	2.1	G	AO												
			General Installation Requirements	3.1	G	AO												
			SD-06 Test Reports															
			Factory Tests	2.16	G	AO												

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		16375	Field Testing	3.10	G	AO												
			Operating Tests	3.10.9	G	AO												
			Cable Installation	3.2.1.4	G	AO												
			SD-07 Certificates															
			Material and Equipment	2.1	G	AO												
			Cable Joints	3.3	G	AO												
			Cable Installer Qualifications		G	AO												
			SD-10 Operation and Maintenance															
			Data															
			Electrical Distribution System	3.10.3														
		16415	SD-02 Shop Drawings															
			Interior Electrical Equipment		G	AO												
			SD-03 Product Data															
			Fault Current and Protective		G	AO												
			Device Coordination Study															
			Manufacturer's Catalog		G	AO												
			Material, Equipment, and Fixture		G	AO												
			Lists															
			Installation Procedures		G	AO												
			As-Built Drawings	1.2.6	G	AO												
			Onsite Tests	3.22.2	G	AO												
			SD-06 Test Reports															
			Factory Test Reports		G	AO												
			Field Test Plan		G	AO												
			Field Test Reports	3.20	G	AO												
			SD-07 Certificates															

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		16415	Materials and Equipment	1.4	G	AO												
		16520	SD-02 Shop Drawings															
			Luminaire drawings	1.5.1.1	G	AO												
			Poles	1.5.1.2	G	AO												
			SD-03 Product Data															
			Luminaires	2.2	G	AO												
			Lamps	2.2.1	G	AO												
			Ballasts	2.2.2	G	AO												
			Brackets	2.7														
			SD-06 Test Reports															
			Test Data for luminaires	1.5.2	G	AO												
			Operating test	3.3														
		16710	SD-02 Shop Drawings															
			Premises Distribution System	1.7	G	AO												
			Installation	3.1	G	AO												
			SD-03 Product Data															
			Record Keeping and	1.8	G	AO												
			Documentation															
			Spare Parts	3.1.9	G	AO												
			Manufacturer's Recommendations	3.1.2	G	AO												
			Test Plan	3.6	G	AO												
			Qualifications	1.5	G	AO												
			SD-06 Test Reports															
			Test Reports	3.6	G	AO												
			SD-07 Certificates															
			Premises Distribution System	1.7	G	AO												

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		16710	Materials and Equipment	2.1	G	AO												
			Installers	1.5.1	G	AO												
		16711	SD-02 Shop Drawings															
			Telephone System		G	AO												
			Installation	3.1	G	AO												
			Record Drawings		G	AO												
			SD-03 Product Data															
			Spare Parts		G	AO												
			Equipment	1.5.2	G	AO												
			Installation	3.1	G	AO												
			Acceptance Tests	3.5	G	AO												
			Cutover and Records	3.4	G	AO												
			SD-06 Test Reports															
			Acceptance Tests	3.5	G	AO												
			SD-07 Certificates															
			Telephone System		G	AO												
			Qualifications	1.4	G	AO												
		16721	SD-02 Shop Drawings															
			Intercommunication System	1.3	G	AO												
			Installation	3.1	G	AO												
			SD-03 Product Data															
			Spare Parts	2.1.4	G	AO												
			Acceptance Tests	3.3	G	AO												
			SD-06 Test Reports															
			Acceptance Tests	3.3	G	AO												

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		16721	SD-10 Operation and Maintenance															
			Data															
			Intercommunication System	1.3	G	AO												
			Intercommunication System, Data		G	AO												
			Package 3															
		16770	SD-02 Shop Drawings															
			Detail Drawings	1.3.3	G	AO												
			SD-03 Product Data															
			Spare Parts	1.3.4														
			SD-06 Test Reports															
			Approved Test Procedures	3.3	G	AO												
			Acceptance Tests	3.3														
			SD-07 Certificates															
			Components	2.1														
			SD-10 Operation and Maintenance															
			Data															
			Radio and Public Address System	1.3														
		16815	SD-02 Shop Drawings															
			Cable Television Premises		G	AO												
			Distribution System															
			Installation	3.1	G	AO												
			SD-03 Product Data															
			Spare Parts		G	AO												
			Manufacturer's Recommendations		G	AO												
			Test Plan		G	AO												
			Qualifications	1.5	G	AO												

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ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		16815	SD-06 Test Reports															
			Testing	3.6	G AO													
			SD-07 Certificates															
			Materials and Equipment	2.1	G AO													
			SD-10 Operation and Maintenance															
			Data															
			Operation and Maintenance		G AO.													
			Manuals															

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TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE *(Read instructions on the reverse side prior to initiating this form)*	DATE	TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO:	FROM:	CONTRACT NO.	CHECK ONE: ☐ THIS IS A NEW TRANSMITTAL ☐ THIS IS A RESUBMITTAL OF TRANSMITTAL _____
SPECIFICATION SEC. NO. *(Cover only one section with each transmittal)*	PROJECT TITLE AND LOCATION		CHECK ONE: THIS TRANSMITTAL IS FOR ☐ FIO ☐ GOV'T. APPROVAL

ITEM NO. *a.*	DESCRIPTION OF ITEM SUBMITTED *(Type size, model number/etc.)* *b.*	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. *(See instruction no. 8)* *c.*	NO. OF COPIES *d.*	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE *g.*	VARIATION *(See instruction No. 6)* *h.*	FOR CE USE CODE *i.*
				SPEC. PARA. NO. *e.*	DRAWING SHEET NO. *f.*			

REMARKS

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated.

_____

NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED *(List by Item No.)*	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.

2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.

3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.

4. Submittals requiring expeditious handling will be submitted on a separate form.

5. Separate transmittal form will be used for submittals under separate sections of the specifications.

6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".

7. Form is self-transmittal, letter of transmittal is not required.

8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.

9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

A -- Approved as submitted.

B -- Approved, except as noted on drawings.

C -- Approved, except as noted on drawings. Refer to attached sheet resubmission required.

D -- Will be returned by separate correspondence.

E -- Disapproved (See attached).

F -- Receipt acknowledged.

FX -- Receipt acknowledged, does not comply as noted with contract requirements.

G -- Other *(Specify)*

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

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SECTION 01355

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10/00

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SECTION 01355

ENVIRONMENTAL PROTECTION
10/00

PART 1 GENERAL

Attachments:
Endangered Species Letter from Buckley Air Force Base (To Follow from the Base)

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. AIR FORCE (USAF)

AFI 32-1053	Pest Management Program

THE NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

33 CFR 328	Definitions
40 CFR 68	Chemical Accident Prevention Provisions
40 CFR 152 - 186	Pesticide Programs
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 279	Standards for the Management of Used Oil
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification
49 CFR 171 - 178	Hazardous Materials Regulations

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996) U.S. Army Corps on Engineers Safety and Health Requirements Manual

BUCKLEY AFB COLORADO

Haz Mat Plan	Hazardous Material Emergency Response Plan

US ARMY CORPS OF ENGINEERS TECHNICAL REPORT

WETLAND MANUAL	Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners,excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

1.2.4 Installation Pest Management Coordinator

Installation Pest Management Coordinator (IPMC) is the individual officially designated by the Installation Commander to oversee the Installation Pest Management Program and the Installation Pest Management Plan.

1.2.5 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor shall discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" shall occur. Land Application shall be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.6 Pesticide

Pesticide is defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.2.7 Pests

The term "pests" means arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.2.8 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers,creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency.

1.2.9 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.2.10 Wetlands

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with WETLAND MANUAL.

1.3 GENERAL REQUIREMENTS

The Contractor shall be responsible for ensuring that the project is constructed in full compliance with all applicable Federal, State, Local and Regional environmental laws and regulations. The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

1.5 PAYMENT

All costs associated with this section shall be included in the contract price. No separate payment will be made for work covered under this section. The Contractor shall be responsible for payment of fees

associated with environmental permits, application, and/or notices obtained by the Contractor. The Contractor shall be responsible for payment of all fines/fees for violations or non-compliance with Federal, State, and local environmental laws and regulations.

1.6 CERTIFICATION REQUIREMENTS

An environmental agency may require design and construction documents to be certified by a Professional Engineer (PE) registered in the State of Colorado. The Contractor shall comply with the certification requirements of the environmental regulatory agencies.

1.7 ENVIRONMENTAL COORDINATION, PERMITS, NOTICES, REVIEWS AND/OR APPROVALS

The Contractor shall be responsible for contacting the appropriate Federal, State, Regional, and local environmental agencies to identify all required environmental permits (construction and operating), notices, reviews, and approvals required for the project. Once the requirements are identified, the Contractor shall be responsible for coordinating the requirements with the Environmental Flight and the Contracting Officer in regard to implementation for a Federal Facility project. The Contractor shall ensure that all coordination, permits, notices, reviews and/or approvals are completed with each applicable phase of the design prior to construction starting for that phase. The Contractor shall be responsible for any contract delays resulting from failure to obtain environmental permits, notices, reviews and/or approvals when required.

1.7.1 Applications, Supporting Documents, and Fees

The Contractor shall obtain and complete all environmental permit applications and notices including any documents required for a modification for an existing permit held by the Facility. The Contractor is responsible for preparing all supporting documents, including but not limited to engineering reports, emission surveys, diagrams, pollutant load calculations, etc. If, in lieu of permits, the governing agency requires review and approval of the design, the Contractor shall submit and obtain approval of the design and associated documents. The Contractor shall be responsible for all fees associated with the permits, applications, reviews, approvals, and notices.

1.7.2 Buckley AFB's Environmental Permits, Notices, Reviews, and/or Approvals

The following is a listing of permits, notices, reviews, and/or approvals which **may be** required for this project. This listing and requirements are not to be considered all-inclusive by the Contractor, but is provided as information to be used in successfully accomplishing the environmental compliances.

a. In the State of Colorado, **EPA** has authority for the National Pollutant Discharge Elimination System (NPDES) on **Federal Facilities**. Construction activities which result in the disturbance of 1 acre of land or more, require coverage under the EPA Storm Water General Permit For Construction Activities (Colorado Permit No. COR10*##F). The Contractor and the Omaha District Corps of Engineers shall be co-permittees. The Contractor shall be responsible for applying Specification Section 01565NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES.

b. A State of Colorado Air Pollution Emission Notice (APEN) for Fugitive Dust Permit for Land Development is required, if construction disturbs surface areas of more than 25 contiguous acres **or** if surface areas of more than 1 acre are to remain disturbed more than six months. The Colorado Department of Public Health and Environment (CDPHE), Division Air Quality issues the permit. The Contractor shall be the permittee and the permit is required prior to any construction starting on the project site. The submittal package to CDPHE shall include a completed Air Pollution Emission Notice (APEN), a Land Disturbance Dust Control Plan, the grading plan, the location plan, and the application fee. The CDPHE requires a minimum of 30 days for review of the package. Prior to issuing the Construction Permit, CDPHE requires the permittee to pay the cost of the review in addition to the application fee.

c. The Colorado Water Quality Control Act and Regulations promulgated thereunder requires that the construction or expansion of any domestic wastewater treatment works with a design capacity of pumping more than two thousand gallons per day have approval of the site location and of the design of the construction or expansion. The Contractor shall be responsible for obtaining the approval of the site and the design of any **expansion** that meets these requirement. The Contractor shall be responsible for completion of application, associated design documents, and all requirements for the site approval process in accordance with the State and Regional requirements. The Contractor shall be responsible for payment of all fees associated with the review and approval. In addition, the Contractor shall be responsible for coordination of the site approval process with the Environmental Flight, the approving agencies and municipalities. The Contractor shall attend all local government board meetings if required by the Denver Area Council of Governments for approval. The site approval process may require up to 3-5 months and should be started as soon as the location of the expansion to the domestic wastewater treatment works and the design calculations are available. A Professional Engineer registered in the State of Colorado is required to certify the design documents and to certify that the expansion was constructed in accordance with the approved design.

e. The City of Aurora, Colorado has a review/permit requirement for any new water and sewer lines. The plans and specifications show the location and type of pipes used will need to be forwarded to the city of Aurora prior to installation/construction. The Contractor is to forward these along with any necessary fees for approval prior to installation. The Contractor shall be responsible for coordination with Buckley Air Force Base Environmental Flight Office before submittal to the City of Aurora.

f. Coordination and notification may be required prior to discharge of hydrostatic test water and disinfection water to the sanitary sewer and/or to the surface for land application. The Contractor shall be responsible for coordination with the Environmental Flight and the Contracting Officer. The discharge shall be in accordance with all Federal, State, and local laws and regulations.

1.8 ENVIRONMENTAL PROTECTION PLAN

During the initial design phase, the Contractor shall submit an Environmental Protection Plan for compliance review and acceptance by the Contracting Officer. For each additional submittal phases, the plan shall be updated and submitted for compliance review and acceptance by the Contracting Officer. Prior to construction, the Contractor shall meet with the Contracting Officer for the purpose of discussing the implementation of the environmental plan, possible subsequent additions and revisions to the plan including any reporting requirements, and methods for administration of the Contractor's environmental plans. During Construction, the Contractor shall maintain the current version of the Environmental Protection Plan on the project site for review by interested parties.

1.8.1 Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, submitting for compliance review, and implementing any additional requirements to be included in the Environmental Protection Plan.

1.8.2 Contents

The environmental protection plan shall include, but shall not be limited to, the following:

a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.

b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.

c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan shall include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.

f. Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.

g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

h. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.

i. Drawing showing the location of borrow areas.

j. The Spill Control plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The Spill Control Plan supplements the requirements of EM 385-1-1 and the Facility's Haz Mat Plan. The Hazardous Material Emergency Response Plan may be reviewed at the Environmental Flight office. This plan shall include as a minimum:

1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Contracting Officer, Facility's Fire Department, and the Facility's Environmental Flight in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

3. Training requirements for Contractor's personnel and methods of accomplishing the training.

4. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

6. The methods and procedures to be used for expeditious contaminant cleanup.

k. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris. The plan shall include schedules for disposal. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction. The Contractor shall attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. The report shall be submitted on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and shall be for the previous quarter (e.g. the first working day of January, April, July, and

October). The report shall indicate the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.

l. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. The plan shall detail the Contractor's actions to comply with and to participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

m. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site. If a State of Colorado Fugitive Dust permit or an El Paso County Construction Activity Permit is required, a copy of any plans and/or permits shall be included as an attachment to the plan.

n. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on site at any given time shall be included in the contaminant prevention plan. As new hazardous materials are brought on site or removed from the site, the plan shall be updated. Copies of all correspondence, inventories, notifications, etc. to the Facility's Hazardous Materials Pharmacy and the Contracting Officer shall be included with the plan.

o. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. If a settling/retention pond is required, the plan shall include the design of the pond including drawings, removal plan, and testing requirements for possible pollutants. If land application will be the method of disposal for the waste water, the plan shall include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented. If disposal is to a sanitary sewer, the plan shall include documentation that the Waste Water Treatment Plant Operator has approved the flow rate, volume, and type of discharge.

p. A historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be on site or in the area are discovered during design or construction. The plan shall include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Contracting Officer.

q. A pesticide treatment plan shall be included and updated, as information becomes available. The plan shall include: sequence of

treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. The Contractor is responsible for Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation specific requirements. The Contractor shall follow AFI 32-1053 Sections 3.4.13 and 3.4.14 for data required to be reported to the Installation.

1.8.3 Appendix

Copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents shall be attached, as an appendix, to the Environmental Protection Plan.

1.9 PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any on site construction activities, the Contractor and the Contracting Officer shall make a joint condition survey. Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report shall be signed by both the the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness. The Contractor shall protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the Contractor's work under the contract.

1.10 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings,plans and specifications which may have an environmental impact will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.11 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Contracting

Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.

3.1.1 Work Area Limits

Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are not to be disturbed shall be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.1.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.1.3 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. The Contractor shall construct or install temporary and permanent erosion and sediment control best management practices (BMPs). BMPs may include, but not be limited to, vegetation cover, silt fences, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins.

3.1.4 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.2 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated. All water areas affected by construction activities shall be monitored by the Contractor. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.2.1 Wetlands

The Contractor shall not enter, disturb, destroy, or allow discharge of contaminants into any wetlands except as authorized herein. The Contractor shall be responsible for the protection of wetlands shown on the drawings in accordance with paragraph ENVIRONMENTAL PERMITS, REVIEWS, AND APPROVALS. Authorization to enter specific wetlands identified shall not relieve the Contractor from any obligation to protect other wetlands within, adjacent to, or in the vicinity of the construction site and associated boundaries. The Contractor will be required to coordinate with Buckley's Base Environmental Flight prior to entering a wetlands.

3.3 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal and State air emission and performance laws and standards.

3.3.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants; shall be controlled at all times, including weekends, holidays and hours when work is not in progress. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations.

3.3.2 Odors

Odors from construction activities shall be controlled at all times. The odors shall not cause a health hazard and shall be in compliance with State regulations and/or local ordinances.

3.3.3 Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise. The Contractor shall comply with the provisions of the State of Colorado's rules.

3.3.4 Burning

Burning shall be prohibited on the Government premises.

3.4 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.4.1 Solid Wastes

Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. Handling, storage, and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill shall be the minimum acceptable off-site solid waste disposal option. The Contractor shall verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate.

3.4.2 Chemicals and Chemical Wastes

Chemicals shall be dispensed ensuring no spillage to the ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. This documentation will be periodically reviewed by the Government. Chemical waste shall be collected in corrosion resistant, compatible containers. Collection drums shall be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes shall be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations.

3.4.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. Prior to generation of a hazardous waste stream, the Contractor shall be responsible for coordination with the Environmental Flight for specific requirements for management and storage of hazardous waste. Regardless of the Contractor's hazardous waste activity generator status, the Contractor shall be responsible for compliance with the Facility's requirements. The Contractor shall, at a minimum, manage and store hazardous waste in compliance with 40 CFR 262 and shall manage and store hazardous waste in accordance with the Facility's Haz Mat Plan. The

Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. The Contractor shall segregate hazardous waste from other materials and wastes, shall protect it from the weather by placing it in a safe covered location, and shall take precautionary measures such as berming or other appropriate measures against accidental spillage. The Contractor shall be responsible for storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations. The Contractor shall transport Contractor generated hazardous waste off Government property within 60 days in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. The Contractor shall dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials shall be immediately reported to the Contracting Officer and the Environmental Office. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility.

3.4.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations. There shall be no storage of fuel on the project site. Fuel must be brought to the project site each day that work is performed.

3.4.5 Waste Water

Disposal of waste water shall be as specified below.

a. Waste water from construction activities, such as on site material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc. shall not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. The Contractor shall dispose of the construction related waste water off-Government property in accordance with all Federal, State, Regional and Local laws and regulations or by collecting and placing it in a retention pond where suspended material can be settled out and/or the water can evaporate to separate pollutants from the water. The site for the retention pond shall be coordinated and approved with the Contracting Officer. The residue left in the pond prior to completion of the project shall be removed, tested, and disposed off-Government property in accordance with Federal, State, and local laws and regulations. The area shall be backfilled to the original grade, top-soiled and seeded/sodded.

b. Water generated from dewatering activities shall be land apply on site in accordance with both the Federal and the State of Colorado laws and regulations for land application.

c. Water generated from the flushing of lines after disinfection or disinfection in conjunction with hydrostatic testing shall be land applied in accordance with all Federal, State, and local laws and regulations for land application or shall be discharged into the sanitary sewer with prior approval and/or notification to the

Waste Water Treatment Plant's Operator.

3.5 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

3.6 NON-HAZARDOUS SOLID WASTE DIVERSION REPORT

The Contractor shall maintain an inventory of non-hazardous solid waste diversion and disposal of construction and demolition debris. The Contractor shall submit a report to the Facility's Environmental Office through the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that non-hazardous solid waste has been generated. The following shall be included in the report:

a. Construction and Demolition (C&D) Debris Disposed = _____ in cubic yards or tons, as appropriate.

b. Construction and Demolition (C&D) Debris Recycled = _____ in cubic yards or tons, as appropriate.

c. Total C&D Debris Generated = _____ in cubic yards or tons, as appropriate.

d. Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount) = _____ in cubic yards or tons, as appropriate.

3.7 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human historical activities. Upon such discovery or find, the Contractor shall immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in impact to or the destruction of these resources. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.8 BIOLOGICAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations. The Contractor shall be responsible for identifying and avoiding disturbing the following species and/or their habitat. The Contractor shall not assume that the list is all inclusive. These species have been identified on the Facility but are not

at the present time on the project site. The Contractor shall be responsible for ensuring that his employees are able to identify and shall avoid disturbing the species and their habitat. The Contractor shall be responsible for coordinating with the Facility Environmental Flight and the Contracting Officer if Threaten and/or Endangered Species are found on the project site. The State of Colorado's Threatened and Endangered Species list along with descriptions of the species and their habitat may be found at http://wildlife.state.co.us/T&E/list.asp.

3.8.1 Black-tailed Prairie Dog (Cynomys ludovicianus)

Black-tailed Prairie Dog (Cynomys ludovicianus) is listed as a State of Colorado Special Concern (not a statutory category). Prior toe construction, the Contractor shall contact the 460 CES/CEV through the Contracting Officer to arrange a Prairie Dog Survey. 460 CES/CEV will then perform this survey. If Prairie Dogs are present, the Base will remove them prior to the contractor's start of work. The Base will be allowed no less than 21 days to perform this survey and remove the Prairie Dogs, if found. The Contractor shall be responsible for identifying any return of the Prairie Dogs to the project site during construction with the Contracting Officer and the Base Environmental Flight personnel. An Environmental Assessment has been completed for the prairie dog managment on Buckley Air Force Base.

3.8.2 Burrowing Owl (Athene cunicularia)

The Burrowing Owl (Athene cunicularia) is a State of Colorado Threatened Species. Burrowing Owls uses prairie dog burrows as a nesting habitat. The burrowing owl may be found on the Facility, especially during the summer months. Unlike the prairie dogs the burrowing owls cannot be relocated and must not be distrubed during nesting (late March through July). Owls start to arrive in late February and remain until the end of October. If construction is starting during this period, a survey must be completed prior to start to ensure no owls are present. If found, construction would have to be delayed until the owl leaves. Construction should start and all potential nesting borrows should be removed before the bird arrives in the spring. Owl surveys can be completed by the Base Natural Resource Manager.

3.8.2.1 Bald Eagle (Haliaeetus leucocephalus)

The Bald Eagle has been seen but do not nest at this time on the Facility. The Bald Eagle prey on prairie dogs. The Government recommends avoiding roosting bald eagles by eliminating activity within 75 meters of the roosting bald eagle. However, this is a general recommendation, and may change dependant upon location, available cover, and concealment. It is the Contractor's responsibility to accurately determine appropriate distances to avoid disturbing the Bald Eagle. The Contractor shall ensure that his employees are able to identify bald eagles and shall avoid disturbing bald eagles.

3.9 INTEGRATED PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, the Contractor, through the Contracting Officer, shall coordinate with the Installation Pest Management Coordinator (IPMC) at the earliest possible time prior to pesticide application. The Contractor shall discuss integrated pest management strategies with the IPMC and receive concurrence from the IPMC through the COR prior to the application of any pesticide associated with

these specifications. Installation Pest Management personnel shall be given the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. The use and management of pesticides are regulated under 40 CFR 152 - 186.

3.9.1 Pesticide Delivery and Storage

Pesticides shall be delivered to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Pesticides shall be stored according to manufacturer's instructions and under lock and key when unattended.

3.9.2 Qualifications

For the application of pesticides, the Contractor shall use the services of a subcontractor whose principal business is pest control. The subcontractor shall be licensed and certified in the state where the work is to be performed.

3.9.3 Pesticide Handling Requirements

The Contractor shall formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and shall use the clothing and personal protective equipment specified on the labeling for use during all phases of the application. Material Safety Data Sheets (MSDS)shall be available for all pesticide products.

3.9.4 Application

Pesticides shall be applied by a State Certified Pesticide Applicator in accordance with EPA label restrictions and recommendation. The Certified Applicator shall wear clothing and personal protective equipment as specified on the pesticide label. Water used for formulating shall only come from locations designated by the Contracting Officer. The Contractor shall not allow the equipment to overflow. Prior to application of pesticide, all equipment shall be inspected for leaks, clogging, wear, or damage and shall be repaired prior to being used.

3.10 PREVIOUSLY USED EQUIPMENT

The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. The Contractor shall consult with the USDA jurisdictional office for additional cleaning requirements.

3.11 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.12 MILITARY MUNITIONS

In the event the Contractor discovers or uncovers military munitions as defined in 40 CFR 260, the Contractor shall immediately stop work in that area and immediately inform the Contracting Officer.

3.13 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. The Contractor shall document all attendees with name and date of attendance at all meetings. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.14 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". The Contractor shall, unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

-- End of Section --

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SECTION 01420

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SECTION 01420

SOURCES FOR REFERENCE PUBLICATIONS
07/04

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization, (e.g. ASTM B 564 Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number.

ACI INTERNATIONAL (ACI)
P.O. Box 9094
Farmington Hills, MI 48333-9094
Ph: 248-848-3700
Fax: 248-848-3701
E-mail: bkstore@concrete.org
Internet: http://www.aci-int.org

AIR-CONDITIONING AND REFRIGERATION INSTITUTE (ARI)
4100 North Fairfax Drive, Suite 200
Arlington, VA 22203
Ph: 703-524-8800
Fax: 703-528-3816
E-mail: ari@ari.org
Internet: http://www.ari.org

AIR CONDITIONING CONTRACTORS OF AMERICA (ACCA)
2800 Shirlington Road, Suite 300
Arlington, VA 22206
Ph: 703-575-4477
Fax: 703-575-4449
E-mail: info@acca.org
Internet: http://www.acca.org

AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL(AMCA)
30 West University Drive
Arlington Heights, IL 60004-1893
Ph: 847-394-0150
Fax: 847-253-0088
E-mail: amca@amca.org

Internet: http://www.amca.org

ALUMINUM ASSOCIATION (AA)
900 19th Street N.W., Suite 300
Washington, DC 20006
Ph: 202-862-5100
Fax: 202-862-5164
Internet: http://www.aluminum.org

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)
1827 Walden Office Square
Suite 550
Schaumburg, IL 60173-4268
Ph: 847-303-5664
Fax: 847-303-5774
E-mail: webmaster@aamanet.org
Internet: http://www.aamanet.org

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
444 North Capital Street, NW, Suite 249
Washington, DC 20001
Ph: 202-624-5800
Fax: 202-624-5806
E-Mail: info@aashto.org
Internet: http://www.aashto.org

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)
P.O. Box 12215
Research Triangle Park, NC 27709-2215
Ph: 919-549-8141
Fax: 919-549-8933
E-mail: quantem@aatcc.org
Internet: http://www.aatcc.org

AMERICAN BEARING MANUFACTURERS ASSOCIATION (ABMA)
2025 M Street, NW, Suite 800
Washington, DC 20036
Ph: 202-367-1155
Fax: 202-367-2155
E-mail: info.abma@smithbucklin.com
Internet: http://www.abma-dc.org

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)
1330 Kemper Meadow Drive
Cincinnati, OH 45240
Ph: 513-742-2020
Fax: 513-742-3355
E-mail: mail@acgih.org
Internet: http://www.acgih.org

AMERICAN FOREST & PAPER ASSOCIATION (AF&PA)
American Wood Council
ATTN: Publications Department
1111 Nineteenth Street NW, Suite 800
Washington, DC 20036
Ph: 800-890-7732 or 202-463-2766
Fax: 202-463-2791
Internet: http://www.awc.org/

AMERICAN GAS ASSOCIATION (AGA)
400 North Capitol Street N.W.
Washington, D.C. 20001
Ph: 202-824-7000
Fax: 202-824-7115
E-mail: webmaster@aga.org
Internet: http://www.aga.org

AMERICAN GAS ASSOCIATION LABORATORIES (AGAL)
400 North Capitol Street N.W.
Washington, D.C. 20001
Ph: 202-824-7000
Fax: 202-824-7115
Internet: http://www.aga.org

AMERICAN HARDBOARD ASSOCIATION (AHA)
c/o Composite Panel Association
18922 Premiere Court
Gaithersburg, MD 20879-1574
Ph: 301-670-0604
Fax: 301-840-1252
Internet: http://www.pbmdf.org

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)
One East Wacker Drive, Suite 3100
Chicago, IL 60601-2001
Ph: 312-670-2400
Fax: 312-670-5403
Publications: 800-644-2400
E-mail: pubs@aisc.org
Internet: http://www.aisc.org

AMERICAN IRON AND STEEL INSTITUTE (AISI)
1140 Connecticut Avenue, NW, Suite 705
Washington, DC 20036
Ph: 202-452-7100
Fax: 202-463-6573
Internet: http://www.steel.org

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
1819 L Street, NW, 6th Floor
Washington, DC 20036
Ph: 202-293-8020
Fax: 202-293-9287
E-mail: info@ansi.org
Internet: http://www.ansi.org/

Note --- ANSI documents beginning with the letter "S" can be ordered from:

Acoustical Society of America (ASA)
2 Huntington Quadrangle, Suite 1NO1
Melville, NY 11747-4502
Ph: 516-576-2360
Fax: 516-576-2377
E-mail: asa@aip.org
Internet: http://asa.aip.org

AMERICAN NURSERY AND LANDSCAPE ASSOCIATION (ANLA)
1000 Vermont Avenue, NW, Suite 300
Washington, DC 20005-4914
Ph: 202-789-2900
Fax: 202-789-1893
Internet: http://www.anla.org

AMERICAN PETROLEUM INSTITUTE (API)
1220 L Street, NW
Washington, DC 20005-4070
Ph: 202-682-8000
Fax: 202-682-8223
Internet: http://www.api.org

AMERICAN SOCIETY FOR NONDESTRUCTIVE TESTING (ASNT)
1711 Arlingate Lane
P.O. Box 28518
Columbus, OH 43228-0518
Ph: 800-222-2768; 614-274-6003
Fax: 614-274-6899
E-mail: webmaster@asnt.org
Internet: http://www.asnt.org

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)
1801 Alexander Bell Drive
Reston, VA 20191-4400
Ph: 703-295-6300 - 800-548-2723
Fax: 703-295-6222
E-mail: marketing@asce.org
Internet: http://www.asce.org

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)
1791 Tullie Circle, NE
Atlanta, GA 30329
Ph: 800-527-4723 or 404-636-8400
Fax: 404-321-5478
E-mail: ashrae@ashrae.org
Internet: http://www.ashrae.org

AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE)
901 Canterbury, Suite A
Westlake, OH 44145
Ph: 440-835-3040
Fax: 440-835-3488
E-mail: info@asse-plumbing.org
Internet: http://www.asse-plumbing.org

AMERICAN WATER WORKS ASSOCIATION(AWWA)
6666 West Quincy Avenue
Denver, CO 80235
Ph: 303-794-7711
Fax: 303-347-0804
Internet: http://www.awwa.org

AMERICAN WELDING SOCIETY (AWS)
550 N.W. LeJeune Road
Miami, FL 33126
Ph: 800-443-9353 - 305-443-9353

Fax: 305-443-7559
E-mail: info@aws.org
Internet: http://www.aws.org

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)
P.O. Box 388
Selma, AL 36702-0388
Ph: 334-874-9800
Fax: 334-874-9008
E-mail: email@awpa.com
Internet: http://www.awpa.com

ARCHITECTURAL WOODWORK INSTITUTE (AWI)
1952 Isaac Newton Square West
Reston, VA 20190
Ph: 703-733-0600
Fax: 703-733-0584
Internet: http://www.awinet.org

ASME INTERNATIONAL (ASME)
Three Park Avenue
New York, NY 10016-5990
Ph: 212-591-7722
Fax: 212-591-7674
E-mail: infocentral@asme.org
Internet: http://www.asme.org

ASPHALT INSTITUTE (AI)
Research Park Drive
P.O. Box 14052
Lexington, KY 40512-4052
Ph: 859-288-4960
Fax: 859-288-4999
E-mail: webmaster@asphaltinstitute.org
Internet: http://www.asphaltinstitute.org

ASSOCIATED AIR BALANCE COUNCIL (AABC)
1518 K Street, NW
Washington, DC 20005
Ph: 202-737-0202
Fax: 202-638-4833
E-mail: aabchq@aol.com
Internet: http://www.aabchq.com

ASSOCIATION OF EDISON ILLUMINATING COMPANIES (AEIC)
600 North 18th Street
P.O. Box 2641
Birmingham, AL 35291
Ph: 205-257-2530
Fax: 205-257-2540
Internet: http://www.aeic.org

ASTM INTERNATIONAL (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 610-832-9500
Fax: 610-832-9555
E-mail: service@astm.org
Internet: http://www.astm.org

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)
355 Lexington Avenue
17th Floor
New York, NY 10017
Ph: 212-297-2122
Fax: 212-370-9047
E-mail: assocmgmt@aol.com
Internet: http://www.buildershardware.com

CARPET AND RUG INSTITUTE (CRI)
P.O. Box 2048
Dalton, GA 30722-2048
Ph: 800-882-8846 or 706-278-3176
Fax: 706-278-8835
Internet: http://www.carpet-rug.com

CAST IRON SOIL PIPE INSTITUTE (CISPI)
5959 Shallowford Road, Suite 419
Chattanooga, TN 37421
Ph: 423-892-0137
Fax: 423-892-0817
Internet: http://www.cispi.org

CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
933 North Plum Grove Road
Schaumburg, IL 60173-4758
Ph: 847-517-1200
Fax: 847-517-1206
Internet: http://www.crsi.org/

CONSUMER PRODUCT SAFETY COMMISSION (CPSC)
4330 East-West Highway
Bethesda, MD 20814-4408
Ph: 301-504-6816
Fax: 301-504-0124 and 301-504-0025
E-mail: info@cpsc.gov
Internet: http://www.cpsc.gov

COPPER DEVELOPMENT ASSOCIATION (CDA)
260 Madison Avenue
New York, NY 10016
Ph: 212-251-7200
Fax: 212-251-7234
E-mail: questions@cda.copper.org
Internet: http://www.copper.org

DUCTILE IRON PIPE RESEARCH ASSOCIATION (DIPRA)
245 Riverchase Parkway East, Suite O
Birmingham, AL 35244
Ph: 205-402-8700
Fax: 205-402-8730
E-mail: info@dipra.org
Internet: http://www.dipra.org

ELECTRONIC INDUSTRIES ALLIANCE (EIA)
2500 Wilson Boulevard
Arlington, VA 22201-3834
Ph: 703-907-7500

Fax: 703-907-7501
Internet: http://www.eia.org

EXPANSION JOINT MANUFACTURERS ASSOCIATION (EJMA)
25 North Broadway
Tarrytown, NY 10591
Ph: 914-332-0040
Fax: 914-332-1541
E-mail: ejma@ejma.org
Internet: http://www.ejma.org

FM GLOBAL (FM)
1301 Atwood Avenue
P.O. Box 7500
Johnston, RI 02919
Ph: 401-275-3000
Fax: 401-275-3029
E-mail: information@fmglobal.com
Internet: http://www.fmglobal.com

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)
University of South California
Kaprielian Hall 200
Los Angeles, CA 90089-2531
Ph: 213-740-2032
Fax: 213-740-8399
E-mail: fccchr@usc.edu
Internet: http://www.usc.edu/dept/fccchr

GLASS ASSOCIATION OF NORTH AMERICA (GANA)
2945 SW Wanamaker Drive, Suite A
Topeka, KS 66614
Ph: 785-271-0208
Fax: 785-271-0166
E-mail: gana@glasswebsite.com
Internet: http://www.glasswebsite.com

GYPSUM ASSOCIATION (GA)
810 First Street, NE, Suite 510
Washington, DC 20002
Ph: 202-289-5440
Fax: 202-289-3707
E-mail: info@gypsum.org
Internet: http://www.gypsum.org

HYDRAULIC INSTITUTE (HI)
9 Sylvan Way
Parsippany, NJ 07054-3802
Ph: 973-267-9700
Fax: 973-267-9055
E-mail: webmaster@pumps.org
Internet: http://www.pumps.org

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SECTION 01451A

CONTRACTOR QUALITY CONTROL

1/03; Omaha Revision 1/04

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SECTION 01451A

CONTRACTOR QUALITY CONTROL
1/03; Omaha Revision 1/04

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 3740	(2001) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E 329	(2002) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Pricing Schedule.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330SUBMITTAL PROCEDURES:

Administrative Submittals

Contractor Quality Control Plan;

The written site-specific Contractor Quality Control Plan as specified herein.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control

system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all design-construction and construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence.

The site project superintendent will be held responsible for the quality of work on the job. The site project superintendent is subject to removal by the Contracting Officer for non-compliance with either the established quality control system or quality requirements specified in this contract. The site project superintendent in this context shall be the highest-level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.2 QUALITY CONTROL PLAN

The Contractor shall furnish for review by the Government, not later than 10 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.1 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the Project Manager or someone higher in the Contractor's organization. Project Manager in this context shall mean the individual with responsibility for the overall management of the project, including quality and production.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of

these letters shall also be furnished to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities approved by the Contracting Officer shall be used.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.3 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 10 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite

and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure safety and contract compliance. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, shop drawing submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be the construction person identified by the contractor in the contractor's proposal, with a minimum of 5 years in related work. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned no other duties. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

3.4.3 CQC Personnel

A staff shall be maintained under the direction of the CQC system manager to perform all QC activities. The staff must be of sufficient size to ensure adequate QC coverage of all work phases, work shifts, and work crews involved in the construction. These personnel may perform other duties, but must be fully qualified by experience and technical training to perform their assigned QC responsibilities and must be allowed sufficient time to carry out these responsibilities. The QC plan will clearly state the duties and responsibilities of each staff member. Other technical specifications may specify individuals for maintaining quality control for specific areas of work. These individuals shall be under the direction of the CQC System Manager.

3.4.4 Additional Requirement

In addition to the above experience and/or education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". This course is periodically offered at each of the four area offices in the Omaha District according to the following revolving training schedule:.

Badger Area	First Session	Between 15 & 25 April
	Second Session	Between 15 & 25 October
Point of Contact	Roy Brewer	(319) 753-1386
Black Hills Area	First Session	Between 1 & 10 March
	Second Session	Between 1 & 10 September
Point of Contact	Dwight Pochant	(605) 923-2983
Fort Crook Area	First Session	Between 15 & 25 January
	Second Session	Between 15 & 25 July
Point of Contact	Al Kreisler	(402) 293-2540
Rocky Mountain	First Session	Between 1 & 10 June
	Second Session	Between 1 & 10 December
Point of Contact	Paul Jendzejec	(719) 556-4184

The exact date and location for the sessions will be determined approximately 30 days in advance of the training. The cost of training is presently established at $50 to be paid by each student in advance of the training. For information about a particular session, the best source is the point of contact listed above.

3.4.5 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals and deliverables are in compliance with the contract requirements. When Section 15951 DIRECT DIGITAL CONTROL FOR HVAC; 15990 TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS; or 15995 COMMISSIONING OF HVAC SYSTEMS are included in the contract, the submittals required by those sections shall be coordinated with Section 01330 SUBMITTAL PROCEDURES to ensure adequate time is allowed for each type of submittal required.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of the construction work as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

a. A review of each paragraph of applicable specifications, reference codes, and standards. Prior to the preparatory meeting for each definable feature of work, the Contractor shall provide all technical references (i.e. building codes, life safety codes, etc.) referenced in the project specifications for feature(s) of work being addressed at the preparatory meeting. These technical references shall be onsite and available for use by Contractor and Government personnel before the preparatory meeting is held and maintained until the feature(s) of work is/are accepted by the Government.

b. A review of the contract drawings.

c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. A review of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. The Government shall be notified at least 48 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government shall be notified at least 48 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the

Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. The Contractor shall perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed the actual cost for the recheck to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and

acceptance testing by the Government shall be delivered to the Resident or Area (as directed) Office.

Coordination for each specific test, exact delivery location, and dates will be made through the Resident or Area (as directed) Office.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. A punch list of items which do not conform to the approved drawings and specifications shall be prepared and included in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

a. Contractor/subcontractor and their area of responsibility.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.

g. Offsite surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions. Include information identified by the "Responsible Individual(s)" for Safety as outlined in SECTION 01525, SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS.

i. Instructions given/received and conflicts in plans and/or specifications.

j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Contracting Officer's Representative on the first day following the date(s) covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 SAMPLE FORMS

Sample forms enclosed at the end of this section.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

_____
(FIRM NAME)

DAILY QUALITY CONTROL REPORT

Daily Report No.: _____ DATE: _____
Contract No. _____
Project Title & Location:
_____
Weather: ____ Precipitation: _____ in. _____ Temp:____ Min. ____ Max. ____

1. Contract/Subcontractors and Area of Responsibility:

NUMBER:	TRADE	HOURS	EMPLOYER	LOCATION/DESCRIPTION WORK

2. Operating Plant or Equipment. (Not hand tools)

Plant/Equipment	Date of Arrival/Departure	Date of Safety Check	Hours Used	Hours Idle	Hours Repair

3. Work Performed Today: (Indicate location and description of work performed by prime and/or subcontractors. When network analysis is used, identify work by NAS activity number).

4. Control Activities Performed:
   Preparatory Inspections: (Identify feature of work and attach minutes).
   Initial Inspections: (Identify feature of work and attach minutes).
   Follow-Up Inspections: (List inspections performed, results of inspection compared to specification requirements, and corrective actions taken when deficiencies are noted).

5. Tests Performed and Test Results: (Identify test requirement by paragraph number in specifications and/or sheet number in plans).

6. Material Received: (Note inspection results and storage provided).

7. Submittals Reviewed:

(a) Submittal No.	(b) Spec/Plan Reference	(c) By Whom	(d) Action

8. Offsite Surveillance Activities, Including Action Taken:

9. Job Safety: (List items checked, results, instructions and corrective actions taken).

10. Remarks: (Instructions received or given. Conflict(s) in Plans and/or specifications. Delays encountered.).

Contractor's Verification: On behalf of the Contractor, I certify this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications, to the best of my knowledge, except as may be noted above.

CQC System Manager Date

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05/00 Rev 02/03

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SECTION 01525

SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS
05/00 Rev 02/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this section to the extent referenced:

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2003) Safety -- Safety and Health Requirements

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1926	Safety and Health Regulations for Construction

1.2 SUMMARY

1.2.1 General

This section provides guidelines for preparation of accident prevention plans, and to implement the accident prevention clause (this specification) and EM 385-1-1, Safety and Health Requirements Manual. The U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1 is available from U.S. Government bookstores operated by the Government Printing Office. Changes to EM 385-1-1 applicable to this contract include only those revisions posted at the following website (all revisions up to the time this solicitation is issued): http://www.hq.usace.army.mil/soh/hqusace_soh.htm ("Changes to EM"). U.S. Government bookstores are located in most major cities including Milwaukee, Chicago, Kansas City, Denver, and Pueblo, Colorado.

1.2.2 Description of Work

Child Development Center located at Buckley AFB, Colorado.

1.3 PRECONSTRUCTION CONFERENCE

See Contract Clause "PRECONSTRUCTION CONFERENCE". A preconstruction conference will be scheduled prior to beginning of site work. Requirements relative to planning and administration of the overall safety program will be discussed.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be

submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

Administrative Submittals

Accident Prevention Plan;

The written site-specific Accident Prevention Plan.

1.5 ACCIDENT PREVENTION PLAN

The Contractor shall submit, prior to the start of on site construction activity, a proposed accident prevention plan which shall be the accident prevention policy to be followed by all of the Contractor's and subcontractor's personnel and supervisory staff during performance of the work.

1.5.1 Requirements

The proposed plan shall be developed after a careful analysis of the work involved and shall be tailored specifically to the conditions of this project. The Contractor's accident prevention plan shall contain, as a minimum, the following general information or procedures for the activity indicated. The Contractor shall submit his plan for review and acceptance prior to commencing work.

1.5.1.1 Responsible Individual(s)

The Contractor shall designate an onsite employee as the individual responsible for insuring the accident prevention plan is implemented and enforced.

1.5.1.2 Subcontractor Supervision

Explain procedures to assure that subcontractor(s) fully comply with the accident prevention plan.

1.5.1.3 Indoctrination of New Employees

The plan shall include provisions for advising workers of the purpose of the accident prevention plan, specific hazards on the job and precautions to be taken, emergency procedures, information concerning tool box safety meetings, required protective equipment, cleanup rules and location of company safety rules (posting or handout).

1.5.1.4 Tool Box Safety Meetings

Hold weekly "Tool Box" safety meetings. Timely safety subjects shall be determined by a responsible individual. Employees will be informed of time, location, who will conduct, and subject. Identify procedures for including subcontractors. The Contractor shall provide a copy of the Weekly Tool Box Meeting and Monthly Supervisor's Safety Meeting to the Contracting Officer.

1.5.1.5 Fire Prevention and Protection

Identify source of fire protection. Insure adequate fire extinguishers, water barrels, or other fire-fighting equipment is located on site. Explain prevention activities to include storage areas and special hazards such as welding and use of flammable liquids, and other special hazards.

1.5.1.6 Housekeeping

Daily cleanup of all debris and waste materials is required. Adequate disposal containers should be placed strategically around the site. Debris shall be removed on a regular basis. Explain procedures that include use of barrels, dumpsters, trash chutes, etc.

1.5.1.7 Mechanical Equipment Inspection

All mechanical equipment (trucks, cranes, forklifts, backhoes, graders, etc.) shall be inspected prior to use and at fixed intervals throughout the life of the contract. Explain how inspections will be accomplished (frequency, by whom, and records to be kept).

1.5.1.8 First Aid and Medical Facilities

First aid facilities shall be made available on the job site. Arrangements for emergency medical attention shall be made prior to start of work. All emergency numbers (doctor, hospital, ambulance, fire department) shall be posted at the project superintendent's office.

1.5.1.9 Sanitation

Include provisions for toilet facilities, drinking water and washing facilities. A sufficient number of toilet facilities as specified in EM 385-1-1 shall be provided unless permission is granted to use existing facilities (portable chemical are authorized). Insure safe drinking water and individual cups are available. For the projects where corrosive or toxic materials are used, separate washing facilities are required.

1.5.1.10 Safety Promotions

The Contractor shall promote accident prevention. Identify method (posters, awards etc.).

1.5.1.11 Accident Reporting

All accidents (employee injuries, vehicle, building, or equipment damage etc.) regardless of their severity, shall be reported to the onsite government representative or to the area engineer, who in turn will advise the Contractor of forms to be submitted and timeframes.

1.5.1.12 Job Hazard Analysis

When job situations change and it is necessary to alter safety requirements, a Job Hazard Analysis will be accomplished, documented, and added as an addendum to the Accident Prevention Plan. Each Job Hazard Analysis shall include, but not be limited to, a description of the work, probable hazards related to that work and positive precautionary measures to be taken to reduce or eliminate each hazard. An example of changing situations may be new subcontractors performing work such as earth moving, trenching, concrete work, roofing, electrical, masonry etc. The onsite government representative will determine the format and amount of detail required of the written plan.

1.6 NOT USED

1.7 EXCAVATION AND TRENCHING

The standards for excavation and trenching are outlined in 29 CFR 1926, Subpart P. These standards shall be followed in addition to those outlined in EM 385-1-1.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

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SECTION 01565

NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES
09/03

PART 1 GENERAL

Attachments: Storm Water Pollution Prevention Plan

1.1 REFERENCES (Not Applicable)

1.2 SUBMITTALS (Not Applicable)

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall be responsible for implementing the terms and requirements of the attached Storm Water General Permit For Construction Activities (Permit No. COR10000F) as specified below. The Government and the Contractor shall be considered co-permittees. The Government has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications. The Contractor shall have day-to-day operational control of those activities which are necessary to ensure compliance with the requirements specified herein. The Contractor shall be responsible for all submissions to the EPA and shall retain the official copy of all documents pertaining to compliance with the permit during construction. The project site is not located in designated critical habitat and there are no known "listed species" located in the project area.

3.2 IMPLEMENTATION

3.2.1 Notice of Intent

The Contractor shall electronically complete and sign a Notice of Intent (NOI) in accordance with NPDES Permit No. COR10000F. The Contractor shall notify the Contracting Officer's Representative within 24 hours after submitting his NOI. The Contractor shall not submit his NOI to the EPA until the Storm Water Pollution Prevention Plan has been accepted. The Contractor may not begin land disturbance activities until authorized by the Contracting Officer.

3.2.2 Storm Water Pollution Prevention Plan

3.2.2.1 General

The Contractor shall review the attached Storm Water Pollution Prevention Plan (SWPPP). Within 20 calendar days of Notice of Award, the Contractor shall complete the portions of the plan where indicated and revise other sections as necessary and furnish the updated SWPPP to the Contracting

Officer for review and acceptance. The Government will provide an electronic copy of the attached SWPPP (Microsoft Word 97) for the Contractor to revise and maintain. The Contractor shall include appropriate controls and measures for any off-site support activities covered under Part 1.3.A.3 of the permit. The SWPPP shall describe the nature and location of the activity and a location map and site map shall be included in accordance with the permit. The Contractor shall be responsible for implementing, maintaining and updating the SWPPP (including Site Map) during construction. Unless otherwise indicated, the Contractor shall be responsible for implementing all measures described in the SWPPP. The Contractor shall maintain the following records and attach to the SWPPP: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated. The Contractor shall keep the official plan at the site. The SWPPP shall be signed by the Government and the Contractor. If major changes to the SWPPP are required during construction, the SWPPP shall be recertified by the Government and the Contractor.

3.2.2.2 Acceptance of SWPPP

Acceptance of the SWPPP is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes to the SWPPP if the Contracting Officer determines that environmental protection requirements are not being met.

3.2.2.3 Notification of Changes

After acceptance of the SWPPP, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.2.3 Posting Notice

The Contractor shall post a copy of the completed Notice of Intent as submitted to the EPA Storm Water Notice Processing Center. The NOI shall be posted conspicously near the main entrance of the construction site.

3.2.4 Inspections and Reporting

The Contractor shall be responsible for all inspections specified in the SWPPP and the general permit. The Contractor shall also prepare and sign all reports summarizing the inspections as required by the SWPPP and the general permit. Copies of inspection reports shall be attached to the SWPPP. The Contractor shall notify the Contracting Officer within 24 hours if an inspection identifies any incidents of non-compliance with the SWPPP and the general permit.

3.2.5 Maintenance

The Contractor shall be responsible for maintaining all erosion and sediment control measures and other protective measures identified in the SWPPP in an effective operating condition. The Government reserves the right to require the Contractor to perform maintenance on erosion and sediment control measures and other protective measures if the Contracting Officer determines that environmental protection requirements are not being met.

3.2.6 Notice of Termination

The Contractor shall notify the Contracting Officer within 2 working days after final stabilization on all portions of the site has been achieved in accordance with Part 5.1 of the permit. The Contractor shall complete and sign a Notice of Termination (NOT) in accordance with NPDES Permit No. COR10000F. The Government's NOT will be furnished to the Contractor within 14 calendar days after final stabilization (as defined in the permit) has been achieved on all portions of the site. The Contractor shall submit the Contractor's and Government's NOTs to the EPA.

3.2.7 Retention of Records

The Government shall be responsible for retaining copies of the SWPPP and all reports in accordance with NPDES Permit No. COR10000F.

3.2.8 Continuation of Expired Permit

If the current NPDES general permit expires prior to completion of construction, the Contractor shall comply with the conditions of the new permit.

-- End of Section --

100% DRAFT
STORM WATER POLLUTION PREVENTION PLAN

CHILD DEVELOPMENT CENTER

P.N. CRWU 043007

FY 2004

BUCKLEY AIR FORCE BASE, COLORADO

Prepared By:

(Contractor firm name) (Contractor logo)
(Address)
(Address)
(City, State)

For:

U.S. Army Engineer District, Omaha
Corps of Engineers
Omaha, Nebraska

APRIL 2004

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GENERAL FACILITY INFORMATION

Name of Facility: Child Development Center, Buckley AFB, Colorado
Facility Address: xxxx A-Basin Avenue, Buckley AFB, Colorado

Facility Contact:

Name: _____

Title: _____

Telephone: _____

Mailing Address: _____

_____

Owner: ___U.S. Air Force_____

Operator: ___(Contractor Firm Name)_____
(if different from Owner)

Standard Industrial classification (SIC) Code:_____N/A_____

Permit Information:
Type: (X) General ( ) Individual

Designated Name: (Contractor Firm Name)

Permit Number: __COR100000F_____

Effective Date of Coverage: _____

Number of Storm Water Outfalls: One

Receiving Waters: South Platte River Basin

Emergency Contact:

Name: _____

Telephone: _____

1.0 OVERVIEW

1.1 INTRODUCTION

This storm water pollution prevention plan (SWPPP) covers the operations at the Buckley AFB Child Development Center project. It has been developed as required under Part I.B of National Pollutant Discharge Elimination System (NPDES) general permit for storm water discharges and in accordance with good engineering practices. This SWPPP describes this facility and its operations, identifies potential sources of storm water pollution at the facility, recommends appropriate best management practices (BMPs) or pollution control measures to reduce the discharge of pollutants in storm water runoff, and provides for periodic review of this SWPPP.

This SWPPP becomes effective as of *(date of start of construction operations).* The non-structural controls will be implemented by *(Contractor firm name).* Structural controls will be in place by *(date of site disturbance).*

The Government has operational control over the plans and specifications for all areas of the project, including the ability to make modifications to those plans and specifications. The Contractor has operational control over day-to-day activities for all areas of the project. The references listed above shall be considered part of the Storm Water Pollution Prevention Plan (SWPPP).

1.2 OBJECTIVES

The goal of the storm water permit program is to improve the quality of surface waters by reducing the amount of pollutants potentially contained in the storm water runoff being discharged. Industrial facilities subject to an NPDES permit must prepare and implement an SWPPP for their facility.

The objective of this SWPPP is three-fold:

1. To identify potential sources of pollution at the Buckley AFB Child Development Center project.

2. To describe best management practices (BMPs) that are to be used at the Buckley AFB Child Development Center project.

3. To provide other elements such as, but not limited to, a facility inspection program, site compliance evaluation program, record keeping and reporting program that will help the Buckley AFB Child Development Center project comply with the terms and conditions of their storm water discharge permit.

2.0 STORM WATER POLLUTION PREVENTION TEAM

The storm water pollution prevention team is responsible for developing, implementing, maintaining, and revising this SWPPP. The members of the team are familiar with the management and operations of the Buckley AFB Child Development Center project.

The member(s) of the team and their primary responsibilities (i.e. implementing, maintaining, record keeping, submitting reports, conducting inspections, employee training, conducting the annual compliance evaluation, testing for non-storm water discharges, signing the required certifications) are as follows:

Name & Title	**Responsibility**
(Project manager)	**Over site of program**
(Superintendent)	**Inspections of physical controls**
Corps of Engineers *(Contracting Officer)***	**Operational Control over the Plans, Specifications and Modifications**

3.0 POTENTIAL SOURCES OF POLLUTANTS

3.1 SITE MAP

Figure 1 presents a site map of the facility showing the following features (as required by the permit):

- Property boundaries
- Buildings and other permanent structures
- Storage or disposal areas for significant materials
- Storm water discharge outfalls
- Location of storm water inlets contributing to each outfall

- Outlines of drainage areas contributing to each outfall
- Location of NPDES permitted discharges other than storm water
- Structural runoff controls and storm water treatment facilities
- Areas of vegetation
- Areas of exposed and/or erodible soils
- Impervious surfaces (roof tops, asphalt, concrete)
- Names and locations of receiving waters
- Areas of known or suspected impacts on surface waters as designated under Part 201 of the Natural Resources and Environmental Protection Act of 1994, Public Act 451 (formerly Act 307).
- Locations where the following activities are exposed to storm water:
  - Fixed fueling operations
  - Vehicle and equipment maintenance and/or cleaning areas
  - Loading/unloading areas
  - Waste storage or disposal areas
  - Liquid storage tanks
  - Equipment operating areas
  - Storage areas
- Any other areas deemed appropriate

(note to Contractor – the basis of the Site Map may be project drawing C4.01, modified to reflect additional information required above)

FIGURE 1.

(insert Site Map here)

3.2 INVENTORY OF EXPOSED MATERIALS

The permit requires a general inventory of significant materials on site. For each significant material on site an evaluation is to be conducted to determine the potential for these materials to be contributed to the runoff being discharged from the facility. Areas to focus on may include:

- Loading and unloading areas
- Other material handling operations (fuel pumps, etc.)
- Outdoor storage areas
- Processes which generate dust or particulate matter
- Roof vents, stacks, and blowers
- Waste generating areas
- Waste disposal practices
- Maintenance and cleaning practices for vehicles and equipment
- Sites of environmental contamination
- Areas where spills of polluting materials have occurred in the past three years
- Any other areas deemed appropriate

Include the ways in which these materials might be exposed to the storm water runoff. And identify the outfalls from which the materials may be discharged if a release should occur.

Area/Process	Material	Method of Exposure	Outfall
Trenching	**Sediment**	**Erosion during excavation**	**Road ditch**
Site Stripping	**Sediment**	**Erosion during excavation**	**Road ditch**
Overlot Grading	**Sediment**	**Erosion during excavation**	**Road ditch**
Stockpile Topsoil	**Sediment**	**Wind or water erosion while stockpiled**	**Road ditch**

3.3 LIST OF PAST SPILLS AND LEAKS

The permit requires a listing of oil and other polluting materials that have been spilled or leaked over the three years prior to the completion of the plan be included in the plan. Also include the date, volume of materials, the exact location of each release, and the actions taken to clean up the materials and/or prevent exposure of the materials to storm water runoff or contamination of surface waters of the state. (If there have been no spills of polluting materials, state that in this section).
(Contractor has no information on past spills in the area of our work).

DATE	MATERIAL	VOLUME	LOCATION	ACTIONS TAKEN

3.4 SUMMARY OF SAMPLING DATA

Not all facilities will have sampling data available. If there is data available for your facility it is to be included in the SWPPP. If there is no data available, please state that in this section.

The following is a summary of the sampling data available for the Buckley AFB Child Development Center project:

Include sampling date, sampling location, parameters measured, range of concentrations for each parameter, sample collector, sample analyst, and a list of any changes in conditions that suggest the storm water data is no longer indicative of the current conditions at the facility.

(Contractor has no information on sample data from the area we will be working in).

4.0 BEST MANAGEMENT PRACTICES

Storm water management controls, or best management practices (BMPs), will be implemented to reduce the amount of pollutants in storm water discharged from the Buckley AFB Child Development Center project.

The permit requires that the following categories of BMPs to be considered, and selected where applicable.

4.1 NON-STRUCTURAL CONTROLS

Non-structural controls are practices that are specifically intended to reduce the amount of pollution getting into surface waters. There are generally implemented to address the problem at the source. They do not require any structural changes to the facility. The following Non-Structural Controls have been selected for implementation:

- **Preventive Maintenance**
  Preventive Maintenance involves the regular inspection, testing, and cleaning of facility equipment and operational systems. These inspections will help to uncover conditions, which might lead to a release of materials. Thus, allowing for maintenance to prevent such a release.

  The following equipment/activities will be included in the preventive maintenance program. (Examples: fuel pumps, storage tanks for waste fluids, all structural controls, etc.)

Equipment	Tasks	Frequency
Trencher	**Inspect**	**Daily**
Trucks	**Inspect**	**Daily**
Loader	**Inspect**	**Daily**
Fuel Truck	**Inspect**	**Daily**

- **Semi-annual Comprehensive Inspections**
  Comprehensive inspections of the facility (equipment, plant areas, and structural controls) are required by the permit. These inspections must occur at least once every six months. Records of the inspections must be kept on file with the SWPPP.

  The following is a description of our facilities comprehensive inspection schedule.

  Area will be inspected at the beginning of project and weekly until complete.

  Any time of rain or snowmelt in excess of 0.5 inches in one event, the site will be inspected for damage or erosion.

- **Good Housekeeping Practices**
  Good housekeeping practices are designed to maintain a clean and orderly work environment. This will reduce the potential for significant materials to come contact with storm water.

  The follow practices are included in our good housekeeping routine. (Examples: keeping the pump area clean, keeping an accurate inventory, sweeping paved areas and floors, picking up repair facilities, etc.)

Area/Equipment	Tasks	Frequency
Trenching	Inspect	Daily
Grading and Import of Borrow Materials	Clean up – Sweep streets	Daily
Topsoil application	Clean up	Daily
Backfill	Compact	Daily
Seeding	Wet spray	One time
Waste Building Materials in Dumpster	Haul offsite	Daily or when full

- **Sedimentation Control Measures**
  There may be certain areas at the facility that are prone to soil erosion. These areas need to be protected, and the soil kept out of the storm water discharge. (If there are no areas prone to soil erosion state that in this section.)

Area of Concern	Control Measures
Trench Area	Backfill and compact daily
Trench Area	Silt fences
Site Grading	Silkt fences and inlet control filters
Finished site grading	Reseed disturbed areas

- **Employee Training**
  Employee training will be a major component in ensuring the success of the facilities SWPPP. The more knowledgeable all employees are about the facility's SWPPP and what is expected of them, the greater the chance that the plan will be successful.

The following is a description of the employee training programs to be implemented to inform appropriate personnel at all levels of responsibility of the components and goals of the SWPPP. (Examples: good housekeeping practices, spill prevention and response procedures, waste minimization practices, informing customers of facility policies, etc.)

Topic	**Employees Included**	**Frequency**
House Keeping	Contractor staff and Subs	Weekly
Spill prevention and response	Contractor staff and subs	At beginning of project and quarterly during project
SWPPP BMP Maintenance	Contractor staff	At beginning of project

- **List of Significant Materials Still Present**
  After the implementation of the non-structural controls the following significant materials are expected to be present in the storm water discharge. These materials will be addressed through the use of structural controls.

  After the implementation of non-structural controls the following materials are expected to still be present in the storm water being discharged from the facility. (If there will be no significant materials present after the implementation of non-structural controls, state that in this section.)
  (Contractor is not aware of any significant materials present)

Material	**Location**	**Outfall**	**Planned Control Measure**

4.2 STRUCTURAL CONTROLS

Structural control measures will be necessary to control any pollutants that are still present in the storm water after the non-structural controls have been implemented. These types of controls are physical features that control and prevent storm water pollution. They can range from preventive measures to collection structures to treatment systems. Structural controls will require construction of a physical feature or barrier. (If no structural control measures are needed at the facility, state that in this section).

- **Preventive Measures**
  Preventive measures are controls that are intended to prevent the exposure of storm water to contaminate.

  The following preventive measures have been chosen for this facility. (Examples: signs and labels, safety posts, fences, a security system, coverings over areas of concern, etc.)

Area	**Material**	**Control Measure**
Trench	Sediment	Backfill and compact daily
Area grading	Sediment	Silt Fences Seed and mulch

- **Diversions**
  Diversion practices are structures (including grading and paving) that are used to divert storm water away from high-risk areas and prevent contaminants from mixing with the runoff, or to channel contaminated storm water to a treatment facility or containment area.

  The following areas are to be protected through the use of diversion structures. (Examples: storage areas, processing areas, past spills, etc.)

Area	**Material**	**Control Measure**
Area grading	Sediment	Divert roadside ditch to new storm sewer

- **Containment**

  Containment areas are structures designed to hold pollutants or contaminated storm water to prevent it from being discharged to surface waters. These structures can range from drip pans to large containment areas required for Pollution Incident Prevention Plans (PIPP) or Spill Control and Countermeasures (SPCC) plans.

  Containment structures will be/have been installed in the following areas. (Examples: containment around waste fluid storage areas, drip pans under valves and pipe connections, curbing around dismantling areas or parts storage areas, etc.)

  (None that Contractor is aware of, no waste or fuels stored on site)

Area	**Material**	**Control Measure**

- **Other Controls**

  There are other control measures that can be used that may not fit into one of the previously mentioned categories. The use of such controls is encouraged.

  The following additional controls have to be used at the facility. (Examples: sumps, oil/water separators, sand filters, vegetative filters, basins [collection, retention, detention], reduce, reuse. and recycle materials, etc.)

  (None that Contractor is aware of, no waste or fuels stored on site)

Area	**Material**	**Control Measure**

5.0 NON-STORM WATER DISCHARGES

The permit requires that all discharge locations be evaluated for the presence of non-storm water discharges. Any unauthorized storm water dischargers must be eliminated, or covered under another National Pollutant Discharge Elimination System (NPDES) permit. Certification that there are no unauthorized discharges must be submitted to the appropriate district supervisor. The following is a list of non-storm water discharges authorized under the general permit.

> Fire fighting activities, fire hydrant flushing, potable water sources including waterline flushing, irrigation drainage, lawn watering, uncontaminated ground water, foundation or footing drains, building wash down where no detergents were used, air conditioning condensate, dust control spraying.

The following table summarizes the evaluation results.

(Will evaluate but in area of construction non storm water discharges are unlikely).

Date	**Outfall**	**Method**	**Evaluator**	**Observations** (are there any non-storm water discharges? Authorized or unauthorized?)	**Date Corrected**

CERTIFICATION OF EVALUATION OF NON-STORM WATER DISCHARGES

I certify under penalty of law that the storm water drainage system in this SWPPP has been tested or evaluated for the presence of non-storm water discharges either by me, or under my direction and supervision. To the best of my knowledge and belief, the information submitted is true, accurate, and complete. And at the time this plan was completed no unauthorized discharges were present. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations.

_____ _____

(Signature) (Date)

_____ _____

(Printed Name) (Title)

6.0 RECORD KEEPING AND REPORTING

The permit requires that records of all preventive maintenance inspections, the semi-annual comprehensive site inspections, records of employee training sessions, and the annual report be retained at *(Contractor firm name)* for at least three years after the permit coverage expires.

These records must be made available, upon request, to a representative of the regulating authority. In the case of facilities which discharge storm water to a municipal separate storm sewer system, the records must also be made available to the operator of the municipal system.

6.1 ANNUAL REPORT

The permit requires that *(Contractor firm name)* prepare an annual report discussing the effectiveness of the SWPPP. This report should include any changes that have been made, the reason for the changes, any spills that occurred, what actions were taken as result of the spill, inspection results, and any other information relevant to the SWPPP. The annual report is to be retained on site.

6.2 SAMPLE RECORD KEEPING AND REPORTING FORMS

The following pages contain sample forms for the record keeping and reporting associated with the SWPPP. The following forms are examples; they are not required to be used by your facility.

Non-storm Water Inspection Report
Good Housekeeping
Preventive Maintenance
Storm Water Inspection Report

NON-STORM WATER INSPECTION REPORT

Date of Inspection: _____ Time: _____

Inspected by (printed name): _____

Signature: _____

Description of type of inspection (check those that apply):
visual observation dye tests smoke tests TV line survey
analysis of accurate schematics sampling/monitoring

Observations/Results: _____

_____

_____

_____

_____

_____

_____

_____

Are there any non-storm water discharges? yes no

Is the discharge authorized under this permit? yes no

Is the discharge covered under another National Pollutant Discharge Elimination System (NPDES) permit? yes no

Are significant structural changes required to eliminate the discharge? yes no

GOOD HOUSEKEEPING

Date: _____ Time: _____

Inspected by (printed): _____

Signature: _____

Areas Inspected	Observations	Actions Taken
Parking areas		
Fueling areas		
Outfalls		
Overlot grading area		
Dumpsters		
Grounds (in general)		
Ditches or drainage inlets		

PREVENTIVE MAINTENANCE

Date: _____Time: _____

Inspected by (printed): _____

Signature: _____

Areas Inspected	Observations	Actions Taken

COMPREHENSIVE INSPECTION

Date: _____ Time:_____

Inspected by (printed): _____

Signature: _____

Areas Inspected	Observations	Actions Taken
Storm water outfalls		
Property boundaries		
Grounds (in general)		
Parking lots		
Storage areas		
Dumpsters		
Waste storage areas		
Equipment		

7.0 CERTIFICATION OF THE SWPPP

I certify under penalty of law that this SWPPP has been developed in accordance with good engineering practices. To the best of my knowledge and belief, the information submitted is true, accurate, and complete. In addition, at the time this plan was completed no unauthorized discharges were present. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations.

_____
(Signature of Operator)

_____ _____
(Printed Name) (Date)

_____ _____
(Signature of Corporate Officer) (Date)

_____ _____
(Printed Name) (Title)

STORM WATER POLLUTION PREVENTION PLAN CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____ _____

(government representative) Date
Authorized Representative
of the Contracting Officer

NPDES Permit Number: _COR10000F_

THIS FORM REPLACES FORM 3510-9 (8-98)
See the Following Pages for Instructions

Form Approved OMB Nos. 2040-0188 and 2040-0211

NPDES FORM

United States Environmental Protection Agency
Washington, DC 20460

Notice of Intent (NOI) for Storm Water Discharges Associated with CONSTRUCTION ACTIVITY Under a NPDES General Permit

Submission of this Notice of Intent (NOI) constitutes notice that the party identified in Section II of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) Number identified in Section I of this form. Submission of this NOI also constitutes notice that the party identified in Section II of this form meets the eligibility requirements in Part 1.3 of the CGP for the project identified in Section III of this form. Permit coverage is required prior to commencement of construction activity until final stabilization. TO OBTAIN AUTHORIZATION, THIS FORM MUST BE COMPLETE AND ACCURATE. SEE INSTRUCTIONS AT THE END OF THIS FORM.

I. Permit Number

II. Operator Information

Name:

IRS Employer Identification Number (EIN): -

Street:

City: State: Zip Code: -

Phone: - - Fax (optional): - -

Email (optional):

III. Project/Site Information

Project/Site Name:

Project Street/Location:

City: State: Zip Code: -

County or similar government subdivision:

Latitude/Longitude (Use one of three possible formats, and specify method)

Latitude
1. _ _º _ _´ _ _´´ N (degrees, minutes, seconds)
2. _ _º _ _ . _ _´ N (degrees, minutes, decimal)
3. _ _ . _ _ _ _º N (decimal)

Longitude
1. _ _ _º _ _´ _ _´´ W (degrees, minutes, seconds)
2. _ _ _º _ _ . _ _´ W (degrees, minutes, decimal)
3. _ _ _ . _ _ _ _º W (decimal)

Method: U.S.G.S. topographic map EPA web site GPS Other:
• If you used a U.S.G.S. topographic map, what was the scale:

Project Located in Indian country? Yes No
If so, name of Reservation OR if not part of a Reservation, put “Not Applicable”:

Estimated Project Start Date: / / (Month Date Year)

Estimated Project Completion Date: / / (Month Date Year)

Estimated Area to be Disturbed (to the nearest quarter acre): .

IV. SWPPP Information

Has the SWPPP been prepared in advance of filing this NOI? Yes No

Location of SWPPP for viewing: Address in Section II Address in Section III Other

If Other:

SWPPP Street:

City:

State: Zip Code: -

SWPPP Contact Information (if different than that in Section II):

Name:

Phone: - - Fax (optional): - -

Email (optional):

V. Discharge Information

What is the name(s) of the waterbody(ies) to which you discharge?

Is this discharge consistent with the assumptions and requirements of applicable EPA approved or established TMDL(s)?

Yes No

VI. Endangered Species Information

Under which criterion of the permit have you satisfied your ESA eligibility obligations?

A B C D E F

- If you select criterion F, provide permit tracking number of operator under which you are certifying eligibility:

VII. Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name:

Print Title:

Signature:

Date (Month Date Year):

NPDES General Permit for Storm Water Discharges From Construction Activities

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National Pollutant Discharge Elimination System
General Permit for Discharges from
Large and Small Construction Activities

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §1251 et. seq., (hereafter CWA or the Act), as amended by the Water Quality Act of 1987, P.L. 100-4, operators of large and small construction activities that are described in Subpart 1.3 of this National Pollutant Discharge Elimination System (NPDES) general permit, except for those activities excluded from authorization of discharge in Subpart 1.3.C of this permit are authorized to discharge pollutants to waters of the United States in accordance with the conditions and requirements set forth herein. Permit coverage is required from the "commencement of construction activities" until "final stabilization" as defined in Appendix A.

This permit shall become effective on July 1, 2003.

This permit and the authorization to discharge shall expire at midnight, July 1, 2008.

Signed:

Linda M. Murphy, Director, Office of Ecosystem Protection
EPA Region 1

Kevin Bricke, Acting Director, Division of Environmental Planning and Protection
EPA Region 2

Carlos E. O'Neill, P.E., Acting Division Director, Caribbean Environmental Protection Division
EPA Region 2

John M. Capacasa, Director, Water Protection Division
EPA Region 3

Rebecca Harvey, Chief, NPDES Program Branch
EPA Region 5

Miguel I. Flores, Director, Water Quality Protection Division
EPA Region 6

Leo J. Alderman, Director, Water, Wetlands, and Pesticides Division
EPA Region 7

Stephen S. Tuber, Assistant Regional Administrator, Office of Partnerships and Regulatory Assistance
EPA Region 8

Nancy Woo, Acting Director, Water Division
EPA Region 9

Randall F. Smith, Director, Office of Water
EPA Region 10

The signatures are for the permit conditions in Parts 1 through 9 and Appendices A through G and for any additional conditions which apply to facilities located in the corresponding state, Indian country, or other area.

PART 1: COVERAGE UNDER THIS PERMIT

1.1 Introduction

This Construction General Permit (CGP) authorizes storm water discharges from large and small construction activities that result in a total land disturbance of equal to or greater than one acre, where those discharges enter surface waters of the United States or a municipal separate storm sewer system (MS4) leading to surface waters of the United States subject to the conditions set forth in this permit. This permit also authorizes storm water discharges from any other construction activity designated by EPA where EPA makes that designation based on the potential for contribution to an excursion of a water quality standard or for significant contribution of pollutants to waters of the United States. This permit replaces two permits issued in 1998 (63 FR 7858, February 17, 1998 for EPA Regions 1, 2, 3, 7, 8, 9, and 10 and 63 FR 36489, July 6, 1998 for EPA Region 6). Any references to the 1998 CGP in this permit refer to those two permits.

This permit is presented in a reader-friendly, plain language format. This permit uses the terms “you” and “your” to identify the person(s) who owns or operates a “facility” or “activity” as defined in Appendix A and who must comply with the conditions of this permit. This format should allow you, the permittee and operator of a large or small construction activity, to easily locate and understand applicable requirements.

The goal of this permit is to reduce or eliminate storm water pollution from construction activity by requiring that you plan and implement appropriate pollution control practices to protect water quality.

1.2 Permit Area

If your large or small construction activity is located within the areas listed in Appendix B, you may be eligible to obtain coverage under this permit. Permit coverage is actually provided by legally separate and distinctly numbered permits covering each of the areas listed in Appendix B.

1.3 Eligibility

Permit eligibility is limited to discharges from “large” and “small” construction activity as defined in Appendix A or as otherwise designated by EPA. This general permit contains eligibility restrictions, as well as permit conditions and requirements. You may have to take certain actions to be eligible for coverage under this permit. In such cases, you must continue to satisfy those eligibility provisions to maintain permit authorization. If you do not meet the requirements that are a pre-condition to eligibility, then resulting discharges constitute unpermitted discharges. By contrast, if you do not comply with the requirements of the general permit, you may be in violation of the general permit for your otherwise eligible discharges.

A. Allowable Storm Water Discharges

Subject to compliance with the terms and conditions of this permit, you are authorized to discharge pollutants in:

1. Storm water associated with large and small construction activity as defined in Appendix A;
2. Storm water discharges designated by EPA as needing a storm water permit under 40 CFR §122.26(a)(1)(v) or §122.26(b)(15)(ii);
3. Discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided:
    a. The support activity is directly related to the construction site required to have NPDES permit coverage for discharges of storm water associated with construction activity;
    b. The support activity is not a commercial operation serving multiple unrelated construction projects by different operators, and does not operate beyond the completion of the construction activity at the last construction project it supports; and
    c. Appropriate controls and measures are identified in a Storm Water Pollution Prevention Plan (SWPPP) covering the discharges from the support activity areas; and
4. Discharges composed of allowable discharges listed in 1.3.A and 1.3.B commingled with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

B. Allowable Non-Storm Water Discharges

You are authorized for the following non-storm water discharges, provided the non-storm water component of the discharge is in compliance with Subpart 3.5 (Non-Storm Water Discharge Management):

1. Discharges from fire-fighting activities;
2. Fire hydrant flushings;
3. Waters used to wash vehicles where detergents are not used;
4. Water used to control dust in accordance with Subpart 3.4.G;
5. Potable water including uncontaminated water line flushings;
6. Routine external building wash down that does not use detergents;
7. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used;
8. Uncontaminated air conditioning or compressor condensate;
9. Uncontaminated ground water or spring water;
10. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
11. Uncontaminated excavation dewatering;
12. Landscape irrigation.

C. Limitations on Coverage

1. This permit does not authorize post-construction discharges that originate from the site after construction activities have been completed and the site has achieved final stabilization, including any temporary support activity. Post-construction storm water discharges from industrial sites may need to be covered by a separate NPDES permit.
2. This permit does not authorize discharges mixed with non-storm water. This exclusion does not apply to discharges identified in Subpart 1.3.B, provided the discharges are in compliance with Subpart 3.5 (Non-Storm Water Discharge Management).
3. This permit does not authorize storm water discharges associated with construction activity that have been covered under an individual permit or required to obtain coverage under an alternative general permit in accordance with Subpart 4.2.
4. This permit does not authorize discharges that EPA, prior to authorization under this permit, determines will cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard. Where such a determination is made prior to authorization, EPA may notify you that an individual permit application is necessary in accordance with Subpart 4.2. However, EPA may authorize your coverage under this permit after you have included appropriate controls and implementation procedures in your SWPPP designed to bring your discharge into compliance with water quality standards.
5. *Discharging into Receiving Waters With an Approved Total Maximum Daily Load Analysis*
   a. You are not eligible for coverage under this permit for discharges of pollutants of concern to waters for which there is a total maximum daily load (TMDL) established or approved by EPA unless you incorporate into your SWPPP measures or controls that are consistent with the assumptions and requirements of such TMDL. To be eligible for coverage under this general permit, you must incorporate into your SWPPP any conditions applicable to your discharges necessary for consistency with the assumptions and requirements of such TMDL. If a specific wasteload allocation has been established that would apply to your discharge, you must incorporate that allocation into your SWPPP and implement necessary steps to meet that allocation.
   b. In a situation where an EPA-approved or established TMDL has specified a general wasteload allocation applicable to construction storm water discharges, but no specific requirements for construction sites have been identified in the TMDL, you should consult with the State or Federal TMDL authority to confirm that adherence to a SWPPP that meets the requirements of the CGP will be consistent with the approved TMDL. Where an EPA-approved or established TMDL has not

specified a wasteload allocation applicable to construction storm water discharges, but has not specifically excluded these discharges, adherence to a SWPPP that meets the requirements of the CGP will generally be assumed to be consistent with the approved TMDL. If the EPA-approved or established TMDL specifically precludes such discharges, the operator is not eligible for coverage under the CGP.

6. *Endangered and Threatened Species and Critical Habitat Protection*

   a. Coverage under this permit is available only if your storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities, as defined in Appendix A, are not likely to jeopardize the continued existence of any species that are federally-listed as endangered or threatened ("listed") under the Endangered Species Act (ESA) or result in the adverse modification or destruction of habitat that is federally-designated as critical under the ESA ("critical habitat").

   b. You are not eligible to discharge if the storm water discharges, allowable non-storm water discharges, or storm water discharge-related activities would cause a prohibited "take" of federally-listed endangered or threatened species (as defined under section 3 of the ESA and 50 CFR 17.3), unless such takes are authorized under sections 7 or 10 of the ESA.

   c. Determining Eligibility: You must use the process in Appendix C (ESA Review Procedures) to determine eligibility *PRIOR* to submittal of the Notice of Intent (NOI). You must meet one or more of the following six criteria (A-F) for the entire term of coverage under the permit:

Criterion A. No federally-listed threatened or endangered species or their designated critical habitat are in the project area as defined in Appendix C; or

Criterion B. Formal consultation with the Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded and that consultation:

i. Addressed the effects of the project's storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and
ii. The consultation resulted in either:

a. Biological opinion finding no jeopardy to federally-listed species or destruction/adverse modification of federally-designated critical habitat, or

b. written concurrence from the Service(s) with a finding that the storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities are not likely to adversely affect federally-listed species or federally-designated critical habitat; or

Criterion C. Informal consultation with the Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded and that consultation:

i. Addressed the effects of the project's storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and
ii. The consultation resulted in either:

a. Biological opinion finding no jeopardy to federally-listed species or destruction/adverse modification of federally-designated critical habitat, or

b. written concurrence from the Service(s) with a finding that the storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities are not likely to adversely affect federally-listed species or federally-designated critical habitat; or

Criterion D. The construction activities are authorized through the issuance of a permit under section 10 of the ESA, and that authorization addresses the effects of the storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities on federally-listed species and federally-designated critical habitat; or

Criterion E. Storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities are not likely to adversely affect any federally-listed

threatened or endangered species or result in the destruction or adverse modification of federally-designated critical habitat; or

Criterion F. The project's storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities were already addressed in another operator's valid certification of eligibility under Criteria A-E which included your construction activities and there is no reason to believe that federally-listed species or federally-designated critical habitat not considered in the prior certification may be present or located in the project area. By certifying eligibility under this criterion, you agree to comply with any measures or controls upon which the other operator's certification was based.

You must comply with any applicable terms, conditions, or other requirements developed in the process of meeting the eligibility requirements of the criteria in this section to remain eligible for coverage under this permit. Such terms and conditions must be documented and incorporated into your SWPPP.

7. Historic Properties

[Reserved]

You are reminded that you must comply with applicable state, tribal and local laws concerning the protection of historic properties and places.

1.4 Waivers for Certain Small Construction Activities

Three scenarios exist under which small construction activities (see definition in Appendix A) may be waived from the NPDES permitting requirements detailed in this general permit. These exemptions are predicated on certain criteria being met and proper notification procedures being followed. Details of the waiver options and procedures for requesting a waiver are provided in Appendix D.

PART 2: AUTHORIZATION FOR DISCHARGES OF STORM WATER FROM CONSTRUCTION ACTIVITY

To obtain coverage under this general permit, you, the operator, must prepare and submit a complete and accurate Notice of Intent (NOI), as described in this Part. Discharges are not authorized if your NOI is incomplete or inaccurate or if you were never eligible for permit coverage.

2.1 Authorization to Discharge Date

This permit is effective as of the publication date in the Federal Register and is effective for five years, expiring at midnight on the anniversary of publication in the fifth year.

A. If you submit an NOI during the first 90 days after the issuance date of this permit you are authorized to discharge storm water from construction activities under the terms and conditions of this permit seven (7) calendar days after submittal to EPA of a complete and accurate NOI (i.e., 7 days from date of postmark), except as noted in Subpart 2.1.C.

B. If you submit an NOI after the first 90 days of this permit and prior to the expiration date of this permit, you are authorized to discharge storm water from construction activities under the terms and conditions of this permit seven (7) calendar days after acknowledgment of receipt of your complete NOI is posted on EPA's NPDES website ***http://www.epa.gov/npdes/stormwater/cgp***, except as noted in Subpart 2.1.C.

C. EPA may delay your authorization based on eligibility considerations of Subpart 1.3 (e.g., ESA concerns). In these instances, you are not authorized for coverage under this permit until you receive notice from EPA of your eligibility.

2.2 Notice of Intent Contents

A. You must use the NOI form provided in Appendix E (or a photocopy thereof) and available at **www.epa.gov/npdes/stormwater/cgp**. If EPA makes other NOI forms available (either directly, by public notice, or by making information available on the Internet), you may take advantage of any of those options to satisfy the NOI use requirements of this Subpart.

B. You must provide the following information on the NOI form:

1. The applicable permit number for which you are requesting coverage (See Appendix B);

2. Operator name, address, telephone number, and Employer Identification Number (EIN) as established by the U.S. Internal Revenue Service;
3. Project/Site name, address, county or similar governmental subdivision, and latitude/longitude of your construction project or site;
4. Whether your site is located in Indian country and if so, the name of the Reservation, if applicable;
5. Whether the SWPPP has been prepared in advance of filing of this NOI and the location where the applicable SWPPP may be viewed;
6. Name of the water(s) of the U.S. into which your site discharges;
7. Indication whether your discharge is consistent with the assumptions and requirements of applicable EPA approved or established TMDLs;
8. Estimated dates of commencement of construction activity and final stabilization (i.e., project start and completion dates);
9. Total acreage (to the nearest quarter acre) to be disturbed for which you are requesting permit coverage;
10. Whether any federally-listed threatened or endangered species, or federally-designated critical habitat are in your project area to be covered by this permit, and the basis for certifying eligibility for permit coverage based on the instructions in Appendix C;
11. A certification statement, signed and dated by an authorized representative as defined in Appendix G, Section 11, and the name and title of that authorized representative.

2.3 Submission Deadlines

A. *New Projects:* To obtain coverage under this permit, you must submit a complete and accurate NOI and be authorized consistent with Subpart 2.1 prior to your commencement of construction activities.

B. *Permitted Ongoing Projects (only applicable for first 90 days after this permit is issued):* If you previously received authorization to discharge for your project under the 1998 CGP and you wish to continue coverage under this permit:

1. Except as noted in 2.3.B.2, you must:
    1. Submit an NOI within 90 days of the issuance date of this permit, and
    2. Until you are authorized under this permit consistent with Subpart 2.1, comply with the terms and conditions of the 1998 CGP under which you were previously authorized.
2. If you meet the termination of coverage requirements in accordance with Subpart 5.1 within 90 days of the issuance date of this permit (e.g., construction will be finished and final stabilization achieved) you must:
    1. Submit an NOT consistent with the 2003 CGP using the NOT form provided in Appendix F, and
    2. Until coverage is no longer required, comply with the terms and conditions of the 1998 CGP under which you were previously authorized.

C. *Unpermitted Ongoing Projects (only applicable for first 90 days after this permit is issued):* If you previously did not receive authorization to discharge for your project under the 1998 CGP and you wish to obtain coverage under this permit:

1. Except as noted in 2.3.C.2, you must:
    1. Submit an NOI within 90 days of the issuance date of this permit, and
    2. Until you are authorized under this permit consistent with Subpart 2.1, comply with an interim Storm Water Pollution Prevention Plan (SWPPP) consistent with the 1998 CGP.
2. If you meet the termination of coverage requirements in accordance with Subpart 5.1 within 90 days of the issuance date of this permit (e.g., construction will be finished and final stabilization achieved) you must comply with an interim Storm Water Pollution Prevention Plan (SWPPP) consistent with the 1998 CGP until permit coverage is no longer required.

D. *Late Notifications:* Operators are not prohibited from submitting NOIs after initiating clearing, grading, excavation activities, or other construction activities. When a late NOI is submitted, authorization for discharges occurs consistent with Subpart 2.1. The Agency reserves the right to take enforcement action for any unpermitted discharges or permit noncompliance that occur between the commencement of construction and discharge authorization.

2.4 Where to Submit

A. Except as noted in Subpart 2.3.B, you must send your complete and accurate NOI to EPA at one of the following addresses:

For Regular U.S. Mail Delivery:
EPA Storm Water Notice Processing Center
Mail Code 4203M
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

For Overnight/Express Mail Delivery:
EPA Storm Water Notice Processing Center
Room 7420
U.S. EPA
1201 Constitution Avenue, NW
Washington, DC 20004

B. In lieu of Subpart 2.4.A, when available, you may submit your NOI using EPA's electronic NOI system (i.e., eNOI) as detailed at www.epa.gov/npdes/stormwater/cgp.

PART 3: STORM WATER POLLUTION PREVENTION PLANS (SWPPPS)

3.1 Storm Water Pollution Prevention Plan Framework

A. A SWPPP must be prepared prior to submission of an NOI as required in Part 2. At least one SWPPP must be developed for each construction project covered by this permit and such SWPPP must be prepared in accordance with good engineering practices.

B. The SWPPP must:

1. Identify all potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges from the construction site;
2. Describe practices to be used to reduce pollutants in storm water discharges from the construction site; and
3. Assure compliance with the terms and conditions of this permit.

C. Once a definable area has been finally stabilized, you may mark this on your SWPPP and no further SWPPP or inspection requirements apply to that portion of the site (e.g., earth-disturbing activities around one of three buildings in a complex are done and the area is finally stabilized, one mile of a roadway or pipeline project is done and finally stabilized, etc).

D. You must implement the SWPPP as written from commencement of construction activity until final stabilization is complete.

3.2 Requirements for Different Types of Operators

You may meet one or both of the operational control components in the definition of operator found in Appendix A. Subpart 3.2.C applies to all permittees having control over only a portion of a construction site.

A. If you have operational control over construction plans and specifications, you must ensure that:

1. The project specifications meet the minimum requirements of this Subpart and all other applicable permit conditions;
2. The SWPPP indicates the areas of the project where the operator has operational control over project specifications, including the ability to make modifications in specifications;
3. All other permittees implementing portions of the SWPPP (or their own SWPPP) who may be impacted by a change to the construction plan are notified of such changes in a timely manner; and
4. The SWPPP indicates the name of the party(ies) with day-to-day operational control of those activities necessary to ensure compliance with the SWPPP or other permit conditions.

B. If you have operational control over day-to-day activities, you must ensure that:

1. The SWPPP meets the minimum requirements of this Subpart and identifies the parties responsible for implementation of control measures identified in the plan;
2. The SWPPP indicates areas of the project where you have operational control over day-to-day activities;
3. The SWPPP indicates the name of the party(ies) with operational control over project specifications (including the ability to make modifications in specifications).

C. If you have operational control over only a portion of a larger project (e.g., one of four homebuilders in a subdivision), you are responsible for compliance with all applicable terms and conditions of this permit as it relates to your activities on your portion of the construction site, including protection of endangered species, critical habitat, and historic properties, and implementation of best management practices (BMPs) and other controls required by the SWPPP. You must ensure either directly or through coordination with other permittees, that your activities do not render another party's pollution control ineffective. You must either implement your portion of a common SWPPP or develop and implement your own SWPPP.

For more effective coordination of BMPs and opportunities for cost sharing, a cooperative effort by the different operators at a site to prepare and participate in a comprehensive SWPPP is encouraged. Individual operators at a site may, but are not required to, develop separate SWPPPs that cover only their portion of the project provided reference is made to other operators at the site. In instances where there is more than one SWPPP for a site, cooperation between the permittees is encouraged to ensure the storm water discharge controls and other measures are consistent with one another (e.g., provisions to protect listed species and critical habitat).

3.3 Pollution Prevention Plan Contents: Site and Activity Description

A. The SWPPP must identify all operators for the project site, and the areas of the site over which each operator has control.

B. The SWPPP must describe the nature of the construction activity, including:

1. The function of the project (e.g., low density residential, shopping mall, highway, etc.);
2. The intended sequence and timing of activities that disturb soils at the site;
3. Estimates of the total area expected to be disturbed by excavation, grading, or other construction activities, including dedicated off-site borrow and fill areas; and
4. A general location map (e.g., USGS quadrangle map, a portion of a city or county map, or other map) with enough detail to identify the location of the construction site and waters of the United States within one mile of the site.

C. The SWPPP must contain a legible site map, showing the entire site, identifying:

1. Direction(s) of storm water flow and approximate slopes anticipated after major grading activities;
2. Areas of soil disturbance and areas that will not be disturbed;
3. Locations of major structural and nonstructural BMPs identified in the SWPPP;
4. Locations where stabilization practices are expected to occur;
5. Locations of off-site material, waste, borrow or equipment storage areas;
6. Locations of all waters of the United States (including wetlands);
7. Locations where storm water discharges to a surface water; and
8. Areas where final stabilization has been accomplished and no further construction-phase permit requirements apply.

D. The SWPPP must describe and identify the location and description of any storm water discharge associated with industrial activity other than construction at the site. This includes storm water discharges from dedicated asphalt plants and dedicated concrete plants, that are covered by this permit.

3.4 Pollution Prevention Plan Contents: Controls to Reduce Pollutants

A. The SWPPP must include a description of all pollution control measures (i.e., BMPs) that will be implemented as part of the construction activity to control pollutants in storm water discharges. For each major activity identified in the project description the SWPPP must clearly describe appropriate control measures, the general sequence during the construction process in which the measures will be implemented, and which operator is responsible for the control measure's implementation.

B. The SWPPP must include a description of interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented. Site plans should ensure that existing vegetation is preserved where possible and that disturbed portions of the site are stabilized. Use of impervious surfaces for stabilization should be avoided.

C. The following records must be maintained as part of the SWPPP:

   1. Dates when major grading activities occur;
   2. Dates when construction activities temporarily or permanently cease on a portion of the site; and
   3. Dates when stabilization measures are initiated.

D. The SWPPP must include a description of structural practices to divert flows from exposed soils, retain/detain flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Placement of structural practices in floodplains must be avoided to the degree practicable.

E. The SWPPP must include a description of all post-construction storm water management measures that will be installed during the construction process to control pollutants in storm water discharges after construction operations have been completed. Structural measures should be placed on upland soils to the degree practicable. Such measures must be designed and installed in compliance with applicable federal, local, state or tribal requirements.

F. The SWPPP must describe measures to prevent the discharge of solid materials, including building materials, to waters of the United States, except as authorized by a permit issued under section 404 of the CWA.

G. The SWPPP must describe measures to minimize, to the extent practicable, off-site vehicle tracking of sediments onto paved surfaces and the generation of dust.

H. The SWPPP must include a description of construction and waste materials expected to be stored on-site with updates as appropriate. The SWPPP must also include a description of controls, including storage practices, to minimize exposure of the materials to storm water, and spill prevention and response practices.

I. The SWPPP must include a description of pollutant sources from areas other than construction (including storm water discharges from dedicated asphalt plants and dedicated concrete plants), and a description of controls and measures that will be implemented at those sites to minimize pollutant discharges.

3.5 Non-Storm Water Discharge Management

The SWPPP must identify all allowable sources of non-storm water discharges listed in Subpart 1.3.B of this permit, except for flows from fire fighting activities, that are combined with storm water discharges associated with construction activity at the site. Non-storm water discharges should be eliminated or reduced to the extent feasible. The SWPPP must identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

3.6 Maintenance of Controls

A. All erosion and sediment control measures and other protective measures identified in the SWPPP must be maintained in effective operating condition. If site inspections required by Subpart 3.10 identify BMPs that are not operating effectively, maintenance must be performed as soon as possible and before the next storm event whenever practicable to maintain the continued effectiveness of storm water controls.

B. If existing BMPs need to be modified or if additional BMPs are necessary for any reason, implementation must be completed before the next storm event whenever practicable. If implementation before the next storm event is impracticable, the situation must be documented in the SWPPP and alternative BMPs must be implemented as soon as possible.

C. Sediment from sediment traps or sedimentation ponds must be removed when design capacity has been reduced by 50 percent.

3.7 Documentation of Permit Eligibility Related to Endangered Species

The SWPPP must include documentation supporting a determination of permit eligibility with regard to Endangered Species, including:

A. Information on whether federally-listed endangered or threatened species, or federally-designated critical habitat may be in the project area;

B. Whether such species or critical habitat may be adversely affected by storm water discharges or storm water discharge-related activities from the project;

C. Results of the Appendix C listed species and critical habitat screening determinations;

D. Confirmation of delivery of NOI to EPA or to EPA's electronic NOI system. This may include an overnight, express or registered mail receipt acknowledgment; or electronic acknowledgment from EPA's electronic NOI system.

E. Any correspondence for any stage of project planning between the U.S. Fish and Wildlife Service (FWS), EPA, the U.S. National Marine Fisheries Service (NMFS), or others and you regarding listed species and critical habitat, including any notification that delays your authorization to discharge under this permit;

F. A description of measures necessary to protect federally-listed endangered or threatened species, or federally-designated critical habitat. The permittee must describe and implement such measures to maintain eligibility for coverage under this permit.

3.8 Copy of Permit Requirements

Copies of this permit and of the signed and certified NOI form that was submitted to EPA must be included in the SWPPP. Also, upon receipt, a copy of the letter from the EPA Storm Water Notice Processing Center notifying you of their receipt of your administratively complete NOI must also be included as a component of the SWPPP.

3.9 Applicable State, Tribal, or Local Programs

The SWPPP must be consistent with all applicable federal, state, tribal, or local requirements for soil and erosion control and storm water management, including updates to the SWPPP as necessary to reflect any revisions to applicable federal, state, tribal, or local requirements for soil and erosion control.

3.10 Inspections

A. Inspections must be conducted in accordance with one of the two schedules listed below. You must specify in your SWPPP which schedule you will be following.

   1. At least once every 7 calendar days, OR
   2. At least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

B Inspection frequency may be reduced to at least once every month if:

   1. The entire site is temporarily stabilized,
   2. Runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or the ground is frozen), or
   3. Construction is occurring during seasonal arid periods in arid areas and semi-arid areas.

C. A waiver of the inspection requirements is available until one month before thawing conditions are expected to result in a discharge if all of the following requirements are met:

   1. The project is located in an area where frozen conditions are anticipated to continue for extended periods of time (i.e., more than one month);
   2. Land disturbance activities have been suspended; and
   3. The beginning and ending dates of the waiver period are documented in the SWPPP.

D. Inspections must be conducted by qualified personnel (provided by the operator or cooperatively by multiple operators). "Qualified personnel" means a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact

storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activity.

E. Inspections must include all areas of the site disturbed by construction activity and areas used for storage of materials that are exposed to precipitation. Inspectors must look for evidence of, or the potential for, pollutants entering the storm water conveyance system. Sedimentation and erosion control measures identified in the SWPPP must be observed to ensure proper operation. Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to waters of the United States, where accessible. Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking.

F. Utility line installation, pipeline construction, and other examples of long, narrow, linear construction activities may limit the access of inspection personnel to the areas described in Subpart 3.10.E above. Inspection of these areas could require that vehicles compromise temporarily or even permanently stabilized areas, cause additional disturbance of soils, and increase the potential for erosion. In these circumstances, controls must be inspected on the same frequencies as other construction projects, but representative inspections may be performed. For representative inspections, personnel must inspect controls along the construction site for 0.25 mile above and below each access point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the areas described above. The conditions of the controls along each inspected 0.25 mile segment may be considered as representative of the condition of controls along that reach extending from the end of the 0.25 mile segment to either the end of the next 0.25 mile inspected segment, or to the end of the project, whichever occurs first.

G. For each inspection required above, you must complete an inspection report. At a minimum, the inspection report must include:

1. The inspection date;
2. Names, titles, and qualifications of personnel making the inspection;
3. Weather information for the period since the last inspection (or since commencement of construction activity if the first inspection) including a best estimate of the beginning of each storm event, duration of each storm event, approximate amount of rainfall for each storm event (in inches), and whether any discharges occurred;
4. Weather information and a description of any discharges occurring at the time of the inspection;
5. Location(s) of discharges of sediment or other pollutants from the site;
6. Location(s) of BMPs that need to be maintained;
7. Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
8. Location(s) where additional BMPs are needed that did not exist at the time of inspection; and
9. Corrective action required including any changes to the SWPPP necessary and implementation dates.

A record of each inspection and of any actions taken in accordance with this Part must be retained as part of the SWPPP for at least three years from the date that permit coverage expires or is terminated. The inspection reports must identify any incidents of non-compliance with the permit conditions. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the construction project or site is in compliance with the SWPPP and this permit. The report must be signed in accordance with Appendix G, Section 11 of this permit.

3.11 Maintaining an Updated Plan

A. The SWPPP, including the site map, must be amended whenever there is a change in design, construction, operation, or maintenance at the construction site that has or could have a significant effect on the discharge of pollutants to the waters of the United States that has not been previously addressed in the SWPPP.

B. The SWPPP must be amended if during inspections or investigations by site staff, or by local, state, tribal or federal officials, it is determined that the discharges the SWPPP is ineffective in eliminating or significantly minimizing pollutants in storm water discharges from the construction site.

C. Based on the results of an inspection, the SWPPP must be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP must be completed within

seven (7) calendar days following the inspection. Implementation of these additional or modified BMPs must be accomplished as described in Subpart 3.6.B.

3.12 Signature, Plan Review and Making Plans Available

A. A copy of the SWPPP (including a copy of the permit), NOI, and acknowledgement letter from EPA must be retained at the construction site (or other location easily accessible during normal business hours to EPA, a state, tribal or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; the operator of a municipal separate storm sewer receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service) from the date of commencement of construction activities to the date of final stabilization. If you have day-to-day operational control over SWPPP implementation, you must have a copy of the SWPPP available at a central location on-site for the use of all those identified as having responsibilities under the SWPPP whenever they are on the construction site. If an on-site location is unavailable to store the SWPPP when no personnel are present, notice of the plan's location must be posted near the main entrance at the construction site.

B. A sign or other notice must be posted conspicuously near the main entrance of the construction site. If displaying near the main entrance is infeasible, the notice can be posted in a local public building such as the town hall or public library. The sign or other notice must contain the following information:

   1. A copy of the completed Notice of Intent as submitted to the EPA Storm Water Notice Processing Center; and

   2. If the location of the SWPPP or the name and telephone number of the contact person for scheduling SWPPP viewing times has changed (i.e., is different than that submitted to EPA in the NOI), the current location of the SWPPP and name and telephone number of a contact person for scheduling viewing times.

   For linear projects, the sign or other notice must be posted at a publicly accessible location near the active part of the construction project (e.g., where a pipeline project crosses a public road).

C. SWPPPs must be made available upon request by EPA; a state, tribal or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; the operator of a municipal separate storm sewer receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service to the requestor. The copy of the SWPPP that is required to be kept on-site or locally available must be made available, in its entirety, to the EPA staff for review and copying at the time of an on-site inspection.

D. All SWPPPs must be signed and certified in accordance with Appendix G, Section 11.

3.13 Management Practices

A. All control measures must be properly selected, installed, and maintained in accordance with any relevant manufacturer specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the operator must replace or modify the control for site situations as soon as practicable.

B. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts.

C. Litter, construction debris, and construction chemicals that could be exposed to storm water must be prevented from becoming a pollutant source in storm water discharges.

D. Except as provided below, stabilization measures must be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.

   1. Where stabilization by the 14th day is precluded by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practicable.

   2. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 14 days, temporary stabilization measures do not have to be initiated on that portion of the site.

3. In arid, semiarid, and drought-stricken areas where initiating perennial vegetative stabilization measures is not possible within 14 days after construction activity has temporarily or permanently ceased, final vegetative stabilization measures must be initiated as soon as practicable.

E. A combination of sediment and erosion control measures are required to achieve maximum pollutant removal.

1. Sediment Basins: For common drainage locations that serve an area with 10 or more acres disturbed at one time, a temporary (or permanent) sediment basin that provides storage for a calculated volume of runoff from the drainage area from a 2-year, 24-hour storm, or equivalent control measures, must be provided where attainable until final stabilization of the site. Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent control measures, must be provided where attainable until final stabilization of the site. When computing the number of acres draining into a common location, it is not necessary to include flows from offsite areas and flows from on-site areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin. In determining whether installing a sediment basin is attainable, the operator may consider factors such as site soils, slope, available area on-site, etc. In any event, the operator must consider public safety, especially as it relates to children, as a design factor for the sediment basin, and alternative sediment controls must be used where site limitations would preclude a safe design.
2. For drainage locations which serve 10 or more disturbed acres at one time and where a temporary sediment basin or equivalent controls is not attainable, smaller sediment basins and/or sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions).
3. For drainage locations serving less than 10 acres, smaller sediment basins and/or sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction area unless a sediment basin providing storage for a calculated volume of runoff from a 2-year, 24-hour storm or 3,600 cubic feet of storage per acre drained is provided.

F. Velocity dissipation devices must be placed at discharge locations and along the length of any outfall channel to provide a non-erosive flow velocity from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., no significant changes in the hydrological regime of the receiving water).

3.14 Documentation of Permit Eligibility Related to Total Maximum Daily Loads

The SWPPP must include documentation supporting a determination of permit eligibility with regard to waters that have an EPA-established or approved TMDL, including:

A. Identification of whether your discharge is identified, either specifically or generally, in an EPA-established or approved TMDL and any associated allocations, requirements, and assumptions identified for your discharge;

B. Summaries of consultation with State or Federal TMDL authorities on consistency of SWPPP conditions with the approved TMDL, and

C. Measures taken by you to ensure that your discharge of pollutants from the site is consistent with the assumptions and requirements of the EPA-established or approved TMDL, including any specific wasteload allocation that has been established that would apply to your discharge.

See section 1.3.C.5 for further information on determining permit eligibility related to TMDLs.

PART 4: SPECIAL CONDITIONS, MANAGEMENT PRACTICES AND OTHER NON-NUMERIC LIMITATIONS

4.1 Continuation of the Expired General Permit

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with the Administrative Procedure Act and remain in force and effect. If you were granted permit coverage prior to the expiration date, you will automatically remain covered by the continued permit until the earliest of:

A. Reissuance or replacement of this permit, at which time you must comply with the conditions of the new permit to maintain authorization to discharge; or

B. Your submittal of a Notice of Termination; or

C. Issuance of an individual permit for the project's discharges; or

D. A formal permit decision by EPA to not reissue this general permit, at which time you must seek coverage under an alternative general permit or an individual permit.

4.2 Requiring an Individual Permit or an Alternative General Permit

A. EPA may require you to apply for and/or obtain either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition EPA to take action under this paragraph. If EPA requires you to apply for an individual NPDES permit, EPA will notify you in writing that a permit application is required. This notification will include a brief statement of the reasons for this decision and an application form. In addition, if you are an existing permittee covered under this permit, the notice will set a deadline to file the application, and will include a statement that on the effective date of issuance or denial of the individual NPDES permit or the alternative general permit as it applies to you, coverage under this general permit will automatically terminate. Applications must be submitted to EPA at the applicable EPA Regional offices listed in Appendix B of this permit. EPA may grant additional time to submit the application upon your request. If you are covered under this permit and you fail to submit in a timely manner an individual NPDES permit application as required by EPA, then the applicability of this permit to you is automatically terminated at the end of the day specified by EPA as the deadline for application submittal.

B. You may request to be excluded from the coverage of this general permit by applying for an individual permit. In such a case, you must submit an individual application in accordance with the requirements of 40 CFR §122.26(c)(1)(ii), with reasons supporting the request, to EPA at the applicable EPA Regional office listed in Appendix B of this permit. The request may be granted by issuance of an individual permit or an alternative general permit if your reasons are adequate to support the request.

C. When an individual NPDES permit is issued to you, who are otherwise subject to this permit, or you are authorized to discharge under an alternative NPDES general permit, the applicability of this permit to you is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. If you, who are otherwise subject to this permit, are denied an individual NPDES permit or an alternative NPDES general permit, the applicability of this permit to you is automatically terminated on the date of such denial, unless otherwise specified by EPA.

4.3 Releases in Excess of Reportable Quantities

The discharge of hazardous substances or oil in storm water discharges from the construction site must be prevented or minimized in accordance with the SWPPP. This permit does not relieve you of the federal reporting requirements of 40 CFR Part 110, 40 CFR Part 117 and 40 CFR Part 302 relating to spills or other releases of oils or hazardous substances.

Where a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117 or 40 CFR Part 302, occurs during a 24-hour period:

- you must provide notice to the National Response Center (NRC) (800–424–8802; in the Washington, DC, metropolitan area call 202–426–2675) in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117 and 40 CFR Part 302 as soon as site staff have knowledge of the discharge; and
- you must modify the SWPPP as required under Subpart 3.11 within 7 calendar days of knowledge of the release to: provide a description of the release, the circumstances leading to the release, and the date of the release. Plans must identify measures to prevent the reoccurrence of such releases and to respond to such releases.

4.4 Spills

This permit does not authorize the discharge of hazardous substances or oil resulting from an on-site spill.

4.5 Attainment of Water Quality Standards After Authorization

A. You must select, install, implement and maintain BMPs at your construction site that minimize pollutants in the discharge as necessary to meet applicable water quality standards. In general, except in situations explained in Subpart 4.5.B below, your SWPPP developed, implemented, and updated consistent with Part 3.0 is considered as stringent as necessary to ensure that your discharges do not cause or contribute to an excursion above any applicable water quality standard.

B. At any time after authorization, EPA may determine that your storm water discharges may cause, have reasonable potential to cause, or contribute to an excursion above any applicable water quality standard. If such a determination is made, EPA will require you to:

   i. Develop a supplemental BMP action plan describing SWPPP modifications in accordance with Subpart 3.11 to address adequately the identified water quality concerns;

   ii. Submit valid and verifiable data and information that are representative of ambient conditions and indicate that the receiving water is attaining water quality standards; or

   iii. Cease discharges of pollutants from construction activity and submit an individual permit application according to Subpart 4.2.

   All written responses required under this part must include a signed certification consistent with Appendix G, Section 11.

PART 5: TERMINATION OF COVERAGE

5.1 Requirements

You may only submit a Notice of Termination (NOT) after one or more of the following conditions have been met:

A. Final stabilization has been achieved on all portions of the site for which you are responsible;

B. Another operator has assumed control according to Appendix G, Section 11.C over all areas of the site that have not been finally stabilized;

C. Coverage under an individual or alternative general NPDES permit has been obtained; or

D. For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

The NOT must be submitted within 30 days of one of the above conditions being met. Authorization to discharge terminates at midnight of the day the NOT is signed.

5.2 Submitting a Notice of Termination

It is your responsibility to submit a complete and accurate Notice of Termination (NOT), using the form provided in Appendix F (or a photocopy thereof) available at www.epa.gov/npdes/stormwater/cgp. If EPA notifies dischargers (either directly, by public notice, or by making information available on the Internet) of other NOT form options (e.g., electronic submission), you may take advantage of those options to satisfy the requirements of Part 5.

A. The Notice of Termination must include the following information:

   1. The NPDES permit tracking number for the storm water discharge;

   2. The basis for submission of the NOT, including: final stabilization has been achieved on all portions of the site for which the permittee is responsible; another operator/permittee has assumed control over all areas of the site that have not been finally stabilized; coverage under an alternative NPDES permit has been obtained; or, for residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner;

   3. You, the operator's name, address, telephone number and your organization's Employer Identification Number (EIN) as established by the U.S. Internal Revenue Service;

   4. The name of the project and address (or a description of location if no street address is available) of the construction site for which the notification is submitted; and

   5. A certification statement, signed and dated by an authorized representative as defined in Appendix G, Section 11 and the name and title of that authorized representative.

5.3 Where to Submit

A. All NOTs must be submitted to one of the following addresses:

For Regular U.S. Mail Delivery:
EPA Storm Water Notice Processing Center
Mail Code 4203M
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

For Overnight/Express Mail Delivery:
EPA Storm Water Notice Processing Center
Room 7420
U.S. EPA
1201 Constitution Avenue, NW
Washington, DC 20004

B. In lieu of Subpart 5.3.A, you can submit your NOT to EPA using EPA's electronic system (i.e., eNOI), when available. Check www.epa.gov/npdes/stormwater/cgp for updates.

PART 6: RETENTION OF RECORDS

Copies of the SWPPP and all documentation required by this permit, including records of all data used to complete the NOI to be covered by this permit, must be retained for at least three years from the date that permit coverage expires or is terminated. This period may be extended by request of EPA at any time.

PART 7: REOPENER CLAUSE

7.1 Procedures for Modification or Revocation

Permit modification or revocation will be conducted according to 40 CFR §122.62, §122.63, §122.64 and §124.5.

7.2 Water Quality Protection

If there is evidence indicating that the storm water discharges authorized by this permit cause, have the reasonable potential to cause or contribute to an excursion above any applicable water quality standard, you may be required to obtain an individual permit in accordance with Part 4.5 of this permit, or the permit may be modified to include different limitations and/or requirements.

7.3 Timing of Permit Modification

EPA may elect to modify the permit prior to its expiration (rather than waiting for the new permit cycle) to comply with any new statutory or regulatory requirements, such as for effluent limitation guidelines, that may be promulgated in the course of the current permit cycle.

PART 8: STANDARD PERMIT CONDITIONS

The federal regulations require that the Standard Conditions provisioned at 40 CFR §122.41 be applied to all NPDES permits. You are required to comply with those Standard Conditions, details of which are provided in Appendix G.

PART 9: PERMIT CONDITIONS APPLICABLE TO SPECIFIC STATES, INDIAN COUNTRY, OR TERRITORIES

The provisions of this Part provide modifications or additions to the applicable conditions of this permit to reflect specific additional conditions required as part of the state or tribal CWA Section 401 certification process, or the Coastal Zone Management Act (CZMA) certification process, or as otherwise established by the permitting authority. The specific additional revisions and requirements only apply to activities in those specific states, Indian country, and federal facilities. States, Indian country, and federal facilities not included in this Part do not have any modifications or additions to the applicable conditions of this permit.

State Coastal Zone Management Act (CZMA) certification was not received from Massachusetts in time for that state to be included in this permit. As such, large construction activities in Massachusetts covered under the 1998 CGP will continue to be covered under that permit. EPA will reissue the CGP for Massachusetts for large and small construction activities at a later date, and will include any state-specific modifications or additions as part of the State's CZMA certification process.

A. Region 1

1. MAR100000: Commonwealth of Massachusetts, except Indian country

   a. State Water Quality Statutes, Regulations, and Policies:

      i. You must comply with the Massachusetts Clean Waters Act (Ch. 21, ss. 23-56).

      ii. You must comply with the conditions in 314 CMR 4.00 - Surface Water Quality Standards.

      iii. You must comply with the conditions in 314 CMR 3.00 - Surface Water Discharge Permit Program.

      iv. You must comply with the Wetlands Protection Act, Ch. 131, s. 40 and its regulations, 310 CMR 10.00 and any order of Conditions issued by a Conservation Commission or a Superseding Order of Conditions issued by the Massachusetts Department of Environmental Protection.

   b. Department of Environmental Protection Storm Water Management Policy:

      i. You must comply with the Massachusetts Storm Water Management Policy, March 1997 and applicable Storm Water Performance Standards, as prescribed by state regulations promulgated under the authority of the Massachusetts Clean Waters Act, MGL Ch. 21, ss. 23-56 and the Wetlands Protection Act Ch. 131, s. 40.

   c. Other State Environmental Laws, Regulations, Policies:

      i. You must comply with the Massachusetts Endangered Species Act [MESA] (MGL Ch. 313A and regulations at 321 CMR 10.00) and any actions undertaken to comply with this storm water permit, shall not result in non-compliance with the MESA.

      ii. You must not conduct activities under this permit that will interfere with implementation of mosquito control work conducted in accordance with Chapter 252 including, s. 5A thereunder and DEP Guideline Number BRP G01-02, West Nile Virus Application of Pesticides to Wetland Resource Areas and Buffer Zones, and Public Water Systems.

   d. Other Department Directives:

      i. The Department may require you to perform water quality monitoring during the permit term if monitoring is necessary for the protection of public health or the environment as designated under the authority at 314 CMR 3.00.

      ii. The Department may require you to provide measurable verification of the effectiveness of BMPs and other control measures in your management program, including water quality monitoring.

      iii. The Department has determined that compliance with this permit does not protect you from enforcement actions deemed necessary by the Department under its associated regulations to address an imminent threat to the public health or a significant adverse environmental impact which results in a violation of the Massachusetts Clean Waters Act, Ch. 21, ss. 26-53.

      iv. The Department reserves the right to modify the 401 Water Quality Certification if any changes, modifications or deletions are made to the general permit. In addition, the Department reserves the right to add and/or alter the terms and conditions of its 401 Water Quality Certification to carry out its responsibilities during the term of this permit with respect to water quality, including any revisions to 314 CMR 4.00, Surface Water Quality Standards.

   e. Permit Compliance

      i. Should any violation of the Massachusetts Surface Water Quality Standards (314 CMR 4.00) or the conditions of this certification occur, the Department will direct you to correct the violations(s). The Department has the right to take any action as authorized by the General Laws of the Commonwealth to address the violation of this permit or the MA Clean Waters Act and the regulations promulgated thereunder. Substantial civil and criminal penalties are authorized under MGL Ch. 21, s. 42 for discharging into Massachusetts' waters in violation of an order or permit issued by this Department. This certification does not relieve the you of the duty to comply with other applicable Massachusetts statutes and regulations.

2. NHR100000: State of New Hampshire

   a. If you disturb 100,000 square feet or more of contiguous area, you must also apply for a "Significant Alteration of the Terrain Permit from DES pursuant to RSA 485-A:17 and Env-Ws 415. This requirement

applies to the disturbances of only 50,000 square feet when construction occurs within the protected shoreline (see RSA 483-B and Env-Ws 1400).

b. You must determine that any excavation dewatering discharges are not contaminated before they will be authorized as an allowable non-storm water discharge under this permit (see Subpart 1.3.B). The water is considered uncontaminated if there is no groundwater contamination within 1,000 feet of the discharge. Information on groundwater contamination can be generated over the Internet via the NHDES web site www.des.state.nh.us (One Stop Data Retrieval, Onestop Master Site Table). The web site also provides E-mail access to an NHDES Site Remediation Contact to answer questions about using the Web site.

c. You must treat any uncontaminated excavation dewatering discharges as necessary to remove suspended solids and turbidity. The discharges must be sampled at a location prior to mixing with storm water at least once per week during weeks when discharges occur. The samples must be analyzed for total suspended solids (TSS) and must meet monthly average and maximum daily TSS limitations of 50 milligrams per liter (mg/L) and 100 mg/L, respectively. TSS (a.k.a. Residue, Nonfilterable) analysis and sampling must be performed in accordance with Tables IB (parameter, units and method) and II (required containers, preservation techniques and holding times) in 40 CFR 136.3 (see: http://www.access.gpo.gov/nara/cfr/waisidx_02/40cfr136_02.html). Records of any sampling and analysis must be maintained and kept with the SWPPP for at least three years after final site stabilization.

d. During site design and preparation of the storm water pollution prevention plan (SWPPP), you must consider opportunities for groundwater recharge using on-site infiltration. The SWPPP must include a description of any on-site infiltration that will be installed as a post construction storm water management measure (see Subpart 3.4.E) or reasons for not employing such measures. For design considerations for infiltration measures see the September 2001 DES publication titled “Managing Storm Water as a Valuable Resource” which is available online at: www.des.state.nh.us/StormWater/construction.htm. Loss of annual recharge to groundwater should be minimized through the use of infiltration measures wherever feasible.

B. Region 2

1. NYR10000I: Indian country within the State of New York

St. Regis Mohawk Territory at Akwesasne

a. NOIs shall also be submitted to the St. Regis Mohawk Tribe, Environment Division, at the same time they are submitted to EPA, at the following address:

St. Regis Mohawk Tribe, Environment Division
412 State Route 37
Akwesasne, NY 13655
Attn: Clean Water Program Manager.

b. In addition, Storm Water Pollution Prevention Plans (and any updates or amendments thereto) must be submitted to the Environment Division and to the Tribal Historic Preservation Officer at least thirty (30) days in advance of corresponding Notices of Intent. This will allow the Environment Division and the THPO to make an informed determination as to whether any proposed discharges might adversely impact the quality of its surface or groundwater, or disturb sites of historic or cultural significance to the Tribe that may be listed, or eligible to be listed, on the National Register of Historic Places.

c. Within 10 days of the inspection required under Subpart 3.10.G of this permit, the permittee shall provide a copy of the Inspection Report to the Environment Division.

C. Region 6

1. NMR150000: The State of New Mexico, except Indian country

NOTE: Conditions in the New Mexico Environment Department (NMED) certification of the permit resulted in permit requirements adding further restrictions on eligibility for discharges to Outstanding National Resource Waters (ONRWs), expanding on requirements for pollution prevention plans, and limiting options provided in the permit related to inspection frequency and final stabilization.

a. In addition to all other provisions of this permit, operators who intend to obtain authorization under this permit for all new storm water discharges must satisfy the conditions in Subpart 9.C.1.a.i, unless a TMDL has been established for the receiving stream which specifies a waste load allocation (WLA) for

construction storm water discharges or the receiving stream is a Tier 3 water, in which case Subpart 9.C.1.a.ii applies.

i. The operator must include a Sediment Control Plan (SCP) as a part of the Storm Water Pollution Prevention Plan (SWPPP). The SCP must include site-specific interim and permanent stabilization, managerial, and structural solids, erosion, and sediment control BMPs and/or other controls that are designed to prevent an increase in the sediment yield and flow velocity from pre-construction, undisturbed conditions. This applies to discharges both during construction and after construction operations have been completed. The SCP must identify, and document the rationale for selecting these BMPs and/or other controls. The SCP must also describe design specifications, construction specifications, maintenance schedules (including a long term maintenance plan), criteria for inspections, as well as expected performance and longevity of the BMPs. Using appropriate soil loss prediction models (such as SEDCAD 4.0, RUSLE, SEDIMONT II, MULTISED, etc.), the operator(s) must demonstrate, and include documentation in the SCP, that implementation of the site-specific practices will result in sediment yields that will not be greater than the sediment yield levels from pre-construction, undisturbed conditions. The SCP must be prepared in accordance with good engineering practices and certified by a registered professional engineer. The operator(s) must design, implement, and maintain BMPs in the manner specified in the SCP and the SWPPP.

ii. Operators are not eligible to obtain authorization under this permit for all new storm water discharges to outstanding national resource waters (ONRWs) (also referred to as "Tier 3: waters). According to the Antidegradation Policy at Paragraph 3 of Subsection A of 20.6.4.8 NMAC, in part, "ONRWs may include, but are not limited to, surface waters of the state within national and state monuments, parks, wildlife refuges, waters of exceptional recreational or ecological significance, and waters identified under the Wild and Scenic Rivers Act." No ONRWs exist at the time this permit is being finalized; however, during the term of the permit, if a receiving water is designated as an ONRW, the operator must obtain an individual permit for storm water discharges from large and small construction activities.

b. Storm water discharges associated with industrial activity to Clean Water Act section 303(d) waters as well as all other "waters of the State" that the New Mexico Environment Department, Surface Waters Quality Bureau (SWQB) has determined to be or may reasonably be expected to be contributing to a violation of a water quality standard and/or that do not comply with the applicable anti-degradation provisions of the State's WQS are not authorized by this permit.

Note: Upon receipt of this determination, NMED anticipates that, within a reasonable period of time, EPA will notify the general permittee to apply for and obtain an individual NPDES permit for these discharges per 40 CFR Part 122.28(b)(3).

c. Inspections required under Subpart 3.10 must be conducted at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. The option for inspections at least once per 7 calendar days is not available. The Inspection Waivers provided in Parts 3.10.B and C still apply.

d. Permittees can not use temporary erosion controls as described in item 3 of the Appendix A definition of "Final Stabilization"as a method for final stabilization under the permit.

e. Signed copies of discharge monitoring reports, individual permit applications, and all other reports required by the permit to be submitted, shall also be sent to:

Program Manager
Point Source Regulation Section
Surface Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

2. NMR15000I: Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10000I and Ute Mountain Reservation Lands that are covered under Colorado permit COR10000I

a. *Pueblo of Acoma* The following conditions apply only to discharges on the Pueblo of Acoma.

i. A copy of the storm water pollution prevention plan, Notice of Intent, and Notice of Termination must be submitted to the Haaku Water Office at the address below. The pollution prevention plan must be submitted to the Pueblo at least thirty (30) days in advance of submitting the Notice of Intent to EPA.

HAAKU WATER OFFICE
Pueblo of Acoma
P.O. Box 309
Pueblo of Acoma, NM 87034

b. *Pueblo of Isleta* The following conditions apply only to discharges on the Pueblo of Isleta.

i. Subpart 1.3.C.4, (Eligibility, Limitations on Coverage) first sentence, is revised to read: "This permit does not authorize discharges that EPA or the Pueblo of Isleta, prior to authorization under this permit, determines will cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard or impairment of a designated use of receiving waters."

ii. Subpart 2.4. (Where to Submit) is amended to add the following section (2.4.C):

C. Copies of all Notices of Intent submitted to EPA must also be sent concurrently to the Pueblo of Isleta at the following address. Discharges are not authorized by this permit unless an accurate and complete Notice of Intent has been submitted to the Pueblo of Islet

Regular U.S. Mail Delivery	OR	Overnight/Express Mail Delivery
Environment Department Pueblo of Isleta P.O. Box 1270 Isleta, NM 87022		Environment Department Building L 11000 Broadway, SE Albuquerque, NM 87105

iii. Part 2 (Authorizations for Discharges of Storm Water from Construction Activity), second sentence, is amended to read: " Discharges are not authorized if your NOI is incomplete or inaccurate, if you failed to submit a copy of the NOI to the Pueblo of Isleta, or if you were never eligible for permit coverage.

iv. Subpart 3.4. (Pollution Prevention Plan Contents: Controls to Reduce Pollutants), section A, last sentence, is amended to read: "For each major activity identified in the project description the SWPPP must clearly describe appropriate control measures, the general sequence during the construction process in which the measures will be implemented, and which operator is responsible for the control measure's implementation and maintenance."

v. Subpart 3.8 (Copy of Permit Requirements), first sentence, is revised to read "Copies of this permit and of the signed and certified NOI form that was submitted to the Pueblo of Isleta and EPA must be included in the SWPPP."

vi. Subpart 3.10.(Inspections), section A is revised to read "Inspections must be conducted at least once every 7 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater."

vii. Subpart 3.10. (Inspections), section G, last paragraph, is amended to add: "Copies of inspection reports that identify incidents of noncompliance shall be sent to Pueblo of Isleta at the address listed in Subpart 2.4.C." (See above)

viii. Subpart 3.12. (Signature, Plan Review and Making Plans Available), section A, first sentence is amended to read: "A copy of the SWPPP (including a copy of the permit) must be retained at the construction site (or other location easily accessible during normal business hours to the Pueblo of Isleta's Environmental Department, EPA, a state, tribal or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; the operator of a municipal separate storm sewer receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service) from the date of commencement of construction activities to the date of final stabilization."

ix. Subpart 3.12. (Signature, Plan Review and Making Plans Available), section C. is amended to read: "SWPPPs must be made available upon request by EPA; representatives of the Pueblo of Isleta Environment Department, a state, tribal or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; the operator of a municipal separate storm sewer receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service to the requestor. The copy of the

SWPPP that is required to be kept on-site or locally available must be made available, in its entirety, to the EPA staff and the Pueblo of Isleta's Environment Department staff for review and copying at the time of an on-site inspection.

x. Subpart 3.13. (Management Practices), section A is amended to add: "Erosion and sediment controls shall be designed to retain sediment on-site."

xi. Subpart 4.3 (Releases in Excess of Reportable Quantities), first bullet is amended to read: "you must provide notice to the Pueblo of Isleta Environment Department (505-869-5748) and the National Response Center (NRC) (800–424–8802; in the Washington, DC, metropolitan area call 202–426–2675) in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117 and 40 CFR Part 302 as soon as site staff have knowledge of the discharge; and"

xii. Subpart 4.5 (Attainment of Water Quality Standards After Authorization), is amended to add the following fourth bullet:

"You must provide the Pueblo of Isleta, at the address listed in Subpart 2.4.C, with a copy of the EPA notification, the supplemental action plan, data and certification required by EPA."

xiii. Subpart 5.3. (Where to Submit) is amended to add the following section (5.3.C):

C. Copies of all Notices of Termination submitted to EPA must also be sent concurrently to the Pueblo of Isleta at the following address.

Regular U.S. Mail Delivery	OR	Overnight/Express Mail Delivery
Environment Department Pueblo of Isleta P.O. Box 1270 Isleta, NM 87022		Environment Department Building L 11000 Broadway, SE Albuquerque, NM 87105

xiv. Any correspondence, other than NOIs and NOTs, with the Pueblo of Isleta concerning storm water discharges authorized by this permit shall sent one of the addresses in Subpart 5.3.C (see above).

xv. Appendix G, Section 9, first sentence is amended to read:

"You must allow the Pueblo of Isleta's Environment Department, EPA, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:"

xvi. Appendix G, Section 12, subsections A, B, C, F, G and H are amended to require that when you must notify EPA of an event (e.g., planned changes, anticipated noncompliance, transfers, required reporting due to potential adverse effects or environmental impacts or other noncompliance matters), the Pueblo of Isleta must also be notified.

xvii. Parties wishing to apply for an Equivalent Analysis Waiver (see Appendix D, Section C) must provide a copy of the waiver analysis to the Pueblo of Isleta at the address specified in Subpart 5.3.C (See above) at the time it is submitted to EPA.

c. *Pueblo of San Juan.* The following conditions apply only to discharges on the Pueblo of San Juan.

i. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Pueblo at the time it is provided to the Environmental Protection Agency, at the following address:

Office of Environmental Affairs
Pueblo of San Juan
P.O. Box 717
San Juan, NM 87566

ii. Appendix G, Section 10 (Monitoring and records), item D is amended to add:

"All monitoring must be conducted in accordance with the Pueblo of San Juan's Quality Assurance Project Plan."

d. *Pueblo of Sandia*. The following conditions apply only to discharges on the Pueblo of Sandia.

i. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Pueblo at the same time it is submitted to the Environmental Protection Agency.

Environment Department
Pueblo of Sandia
Box 6008
Bernalillo, NM 87004

ii. The Storm Water Pollution Prevention Plan must be available to tribal environmental personnel upon request.

iii. You must telephone the Pueblo of Sandia Environment Department at (505) 867-4533 of any noncompliance that may endanger human health or the environment within ten (10) hours of becoming aware of the circumstance.

e. *Santa Clara Pueblo*. The following conditions apply only to discharges on the Santa Clara Pueblo.

i. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Santa Clara Pueblo Office of Environmental Affairs at the same time it is submitted to the Environmental Protection Agency.

Santa Clara Pueblo
Office of Environmental Affairs
One Knee Street
P.O. Box 580
Espanola, NM 87532

f. *Pueblo of Tesuque* The following conditions apply only to discharges on the Pueblo of Tesuque.

i. A copy of the storm water pollution prevention plan, Notice of Intent, and Notice of Termination must be submitted to the Pueblo of Tesuque Environment Department at the address below. The Notice of Intent and the Notice of Termination must be submitted at the same time they are submitted to EPA. The pollution prevention plan must be submitted before the project begins. Phone: 505- 983-2667 FAX: 505-982-2331

Pueblo of Tesuque
Environment Department
Rt. 42, Box 360-T
Santa Fe, NM 87506

3. OKR15000F: Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).

a. Subpart 1.3.C. (Limitations on Coverage) is modified to add paragraphs 8 and 9 as follows:

"8. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Big Lee Creek or an water or watershed designated "ORW" (Outstanding Resource Water) in Oklahoma's Water Quality Standards, this permit may only be used to authorize discharges from temporary construction activities. Discharges from ongoing activities such as sand and gravel mining or any other mineral mining are not authorized.

9. Activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Big Lee Creek or an water or watershed designated "ORW" (Outstanding Resource Water) in Oklahoma's Water Quality Standards, this permit may not be used to authorize discharges from concrete or asphalt batch plants."

D. Region 8

1. MTR10000I: Indian country within the State of Montana

a. Confederated Salish and Kootenai Tribes of the Flathead Nation. The following conditions apply only for projects on the Flathead Indian Reservation:

i. The permittee must send the SWPPP to the Tribes at least 30 days before construction starts. The 30 day period will give Tribal staff time to become familiar with the project site, prepare for construction inspections and determine compliance with Tribal water quality standards, as required by the Tribe's Water Quality Management Ordinance 89B (1990) and Surface Water Quality Standards & Antidegradation Policy (1995). Copies of the SWPPP should be sent to the following address:

Confederated Salish and Kootenai Tribes
Natural Resources Department
Department Head
P.O. Box 278
Pablo, MT 59855

ii. Before submitting the Notice of Termination, permittees must clearly demonstrate to an appointed tribal staff person during an on-site inspection that requirements for site stabilization have been met and all temporary erosion control structures removed. The staff person performing the on-site inspection will be determined by the Environmental Protection Division Manager. The staff person will draft a short letter stating the stabilization requirements have been met to add to the permittees Notice of Termination submission to EPA.

iii. The permittee must send a copy of the Notice of Intent (NOI) and the Notice of Termination (NOT) to the Tribes at the same time that the NOI and NOT is sent to EPA. Copies of the NOI and NOT should be sent to the address above.

b. Fort Peck Tribes - Assiniboine & Sioux. The following conditions apply only for projects within the Fort Peck Indian Reservation:

i. The permittee must send a copy of the Notice of Intent (NOI) and the Notice of Termination (NOT) to the Tribes at the same time that the NOI and NOT is sent to EPA. Copies of the NOI and NOT should be sent to the following address:

Deb Madison
Environmental Program Manager
Fort Peck Assiniboine & Sioux Tribes
P.O. Box 1027
Poplar, MT 59255

E. Region 9

1. ASR100000: The Island of American Samoa

a. Discharges authorized by the general permit shall meet all applicable American Samoa water quality standards.

b. Permittees discharging under the general permit shall comply with all conditions of the permit.

2. AZR10000I: Indian country lands within the State of Arizona, including Navajo Reservation lands in New Mexico and Utah

a. White Mountain Apache Tribe. The following condition applies only for projects on the White Mountain Apache Reservation: All NOIs for proposed storm water discharge coverage shall be provided to the following address:

Tribal Environmental Planning Office
P.O. Box 2109
Whiteriver, AZ 85941

3. NIR100000: Commonwealth of the Northern Mariana Islands (CNMI)

a. An Earthmoving and Erosion Control Permit shall be obtained from the CNMI DEQ prior to any construction activity covered under the NPDES general permit.

b. All conditions and requirements set forth in the USEPA NPDES general permit for discharges from large and small construction must be complied with.

c. A SWPPP for storm water discharges from construction activity must be approved by the Director of the CNMI DEQ prior to the submission of the NOI to USEPA. The CNMI address for the submittal of the SWPPP for approval is:

Commonwealth of the Northern Mariana Islands
Office of the Governor
Director, Division of Environmental Quality (DEQ)
P.O. Box 501304 C.K.
Saipan, MP 96950-1304

d. An NOI to be covered by the general permit for discharges from large and small construction sites must be submitted to CNMI DEQ (use above address) and USEPA, Region 9, in the form prescribed by USEPA, accompanied by a SWPPP approval letter from CNMI DEQ.

e. The NOI must be postmarked seven (7) calendar days prior to any storm water discharges and a copy must be submitted to the Director of CNMI DEQ (use above address) no later than seven (7) calendar days prior to any stormwater discharges.

f. Copies of all monitoring reports required by the NPDES general permit must be submitted to CNMI DEQ (use above address).

g. In accordance with section 10.3(h) and (i) of the CNMI water quality standards, CNMI DEQ reserves the right to deny coverage under the general permit and to require submittal of an application for an individual NPDES permit based on a review of the NOI or other information made available to the Director.

F. Region 10

1. AKR100000: The State of Alaska, except Indian country

a. Operators of construction projects disturbing five or more acres occurring outside the Municipality of Anchorage must submit a copy of the Storm Water Pollution Prevention Plan (SWPPP) and a copy of the Notice of Intent (NOI) to the State of Alaska Department of Environmental Conservation (ADEC) for review, and shall be accompanied by the state-required fee of $400. Submittal of the SWPPP and the NOI to the ADEC should be made at the same time the NOI is submitted to the EPA.

b. Operators of publicly-funded projects disturbing five or more acres occurring within the Municipality of Anchorage must submit a copy of the SWPPP and a copy of the NOI to the ADEC for review, and shall be accompanied by the state-required fee of $400. Submittal of the SWPPP and the NOI to the ADEC should be made at the same time the NOI is submitted to the EPA.

c. Operators of construction projects disturbing at least one acre and less than five acres must submit a copy of the NOI to the ADEC at the same time it is submitted to the EPA.

d. Storm Water Pollution Prevention Plans and Notices of Intent must be submitted to ADEC at the following address:

Alaska Department of Environmental Conservation
Water Quality Permitting/Storm Water
555 Cordova Street
Anchorage, Alaska 99501

e. Operators of private construction projects disturbing one or more acres within the Municipality of Anchorage shall submit a copy of the Storm Water Pollution Prevention Plan to the Municipality at the following address:

Municipality of Anchorage, Office of Planning Development and Public Works
4700 S. Bragaw Street
P.O. Box 196650
Anchorage, Alaska 99519-6650

f. Submittal of the SWPPP to the Municipality of Anchorage should be made before or at the same time the NOI is submitted to the EPA and the ADEC and shall be accompanied by any Municipality-required fee.

2. IDR100000: The State of Idaho, except Indian country
   a. Any construction related storm water discharges to impaired water bodies on Idaho's Clean Water Act (CWA) Section 303(d) list with EPA-approved Total Maximum Daily Loads (TMDL) must be consistent with any load allocations established by the applicable TMDL.
   b. No net increase of listed pollutants is allowed in any construction related storm water discharges to an impaired water body considered "high priority" as included on Idaho's CWA Section 303(d) list that does not yet have an EPA-approved TMDL.
   c. If a TMDL has not been established for an impaired water body considered "medium priority" or "low priority" as included on Idaho's CWA Section 303(d) list, BMPs shall be employed as necessary to prohibit further impairment of the designated or existing beneficial uses.
   d. Only BMPs authorized by the appropriate designated agency as defined in the Idaho Water Quality Standards and Wastewater Treatment Requirements (IDAPA 58.01.02 et seq.), or otherwise approved by the Idaho Department of Environmental Quality, will be allowed.
   e. Use of the "Equivalent Analysis Waiver" in Addendum D is not authorized.
   f. Operators may contact the Idaho Department of Environmental Quality regional office nearest the construction activity for more information about impaired waterways:

Boise Regional Office:
1445 N. Orchard
Boise ID 83706-2239
Tel: (208)373-0550
Fax: (208)373-0287

Cascade Satellite Office:
109 N. Main St., PO Box 247
Cascade, ID 83611
Tel: (208)382-6808
Fax: (208)382-3327

Coeur d'Alene Regional Office:
2110 Ironwood Parkway
Coeur d'Alene ID 83814
Tel: (208)769-1422
Fax: (208)769-1404

Grangeville Satellite Office:
300 W. Main
Grangeville ID 83530
Tel: (208)983-0808
Fax: (208)983-2873

Idaho Falls Regional Office:
900 N. Skyline, Suite B
Idaho Falls, ID 83402
Tel: (208)528-2650
Fax: (208)528-2695

Lewiston Regional Office:
1118 "F" Street
Lewiston, ID 83501
Tel: (208)799-4370
Toll Free: 1-877-541-3304
Fax: (208)799-3451

Pocatello Regional Office:
444 Hospital Way #300
Pocatello ID 83201
Tel: (208)236-6160
Fax: (208)236-6168

Twin Falls Regional Office:
601 Pole Line Road, Suite 2
Twin Falls, ID 83301
Tel: (208)736-2190
Fax: (208)736-2194

3. ORR10000I: Indian country within the State of Oregon, except Fort McDermitt Reservation lands (see Region 9):
   a. Confederated Tribes of the Umatilla Indian Reservation. The following conditions apply only for projects within the exterior boundaries of the Umatilla Indian Reservation:
      i. The operator shall be responsible for achieving compliance with the Confederated Tribes of the Umatilla Indian Reservation's (CTUIR) Water Quality Standards.
      ii. The operator shall submit all Erosion Control and/or Storm Water Pollution Prevention Plans to the CTUIR Water Resources Program for review and approval by the Department of Natural Resources Director prior to submitting the Notice of Intent to EPA and prior to beginning any discharge activities.
      iii. The operator shall contact the CTUIR Tribal Historic Preservation Office (THPO) prior to beginning any construction activities to determine whether a cultural resource survey of the project area or other investigation is required. All cultural resource fieldwork must be conducted by qualified personnel and documented using Oregon Reporting Standards. The resulting report must be submitted to the THPO for concurrence at least 30 days before any ground disturbing work can occur at the site. The operator must obtain THPO concurrence in the form of a letter, which (if necessary) will include any measures that must be taken to prevent or mitigate adverse effects to potentially eligible historic properties, prior to any ground disturbing work.
      iv. The operator shall submit copies of the Notice of Intent to the CTUIR Water Resources Program and the CTUIR Tribal Historic Preservation Office at the same time it is submitted to EPA.

v. Erosion Control and Storm Water Pollution Prevention Plans and Notices of Intent shall be submitted to:

Confederated Tribes of the Umatilla Indian Reservation
Water Resources Program
P.O. Box 638
Pendleton, OR 97801
(541) 276-3447

Confederated Tribes of the Umatilla Indian Reservation
Cultural Resources Protection Program
Tribal Historic Preservation Office
P.O. Box 638
Pendleton, OR 97801
(541) 276-3629

b. Confederated Tribes of Warm Springs. The following conditions apply only for projects on the Warm Springs Indian Reservation:

i. All activities covered by this NPDES general permit occurring within a designated riparian buffer zone as established in Ordinance 74 (Integrated Resource Management Plan or IRMP) must be reviewed, approved and permitted through the Tribe's Hydraulic Permit Application process, including payment of any applicable fees.

ii. All activities covered by this NPDES general permit must follow all applicable land management and resource conservation requirements specified in the IRMP.

iii. Operators of activities covered by this NPDES general permit must submit a Storm Water Pollution Prevention Plan to the Tribe's Water Control Board at the following address for approval at least 30 days prior to beginning construction activity:

Chair, Warm Springs Water Control Board
P.O. Box C
Warm Springs, Oregon 97761

4. WAR10000F: Federal Facilities in the State of Washington, except those located on Indian Country

The following conditions apply to stormwater discharges from all permitted construction sites which disturb one acre or more and which discharge to surface waters (40 CFR part 122.26(b)(14)(x) and 122.26 (b)(15)):

a. Discharges must not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), sediment management standards (Chapter 173-204 WAC), ground water quality standards (Chapter 173-200 WAC), and human health-based criteria in the National Toxics Rule (Federal Register, Vol. 57, No. 246, Dec. 22, 1992, pages 60848-60923). Discharges that are not in compliance with these standards are not authorized.

b. You must apply all known available and reasonable methods of prevention, control and treatment (AKART), including the preparation and implementation of an adequate Stormwater Pollution Prevention Plan (SWPPP), with all appropriate BMPs installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.

c. Stormwater BMPs must be properly designed, constructed, maintained and operated to:

i. Prevent pollution of state waters and protect water quality, including compliance with applicable state water quality standards;

ii. Satisfy state requirements for all known available and reasonable methods of prevention, control and treatment (AKART) of wastes (including construction stormwater runoff) prior to discharge to waters of the state; and

iii. Satisfy the federal technology-based treatment requirements under 40 CFR part 125.3.

d. You must document the technical basis for the design criteria used to select and design your stormwater management BMPs. You must document within your Stormwater Pollution Prevention Plan (SWPPP) how stormwater BMPs were selected, the pollutant removal performance expected from the BMP being selected, the technical basis (scientific, technical studies, and/or modeling) which support the performance claims for the BMPs being selected, and an assessment of how the selected BMP will

comply with state water quality standards, satisfy the state AKART requirements, and satisfy the federal technology-based treatment requirements.

If you choose to follow the stormwater management practices contained in stormwater technical manuals approved by Washington State, including the proper selection, implementation and maintenance of appropriate BMPs, you are presumed to have satisfied this demonstration requirement and do not need to include within the SWPPP the technical basis which support the performance claims for the BMPs being used. The SWPPP must include a reference to the manual used. Approved stormwater technical manuals include:

i. Stormwater Management Manual for Western Washington, August 2001, for sites west of the crest of the Cascade Mountains;

ii. Stormwater Management Manual for Eastern Washington, (completion expected in the fall of 2003) for sites east of the crest of the Cascade Mountains; or

iii. Other equivalent stormwater management guidance documents approved by Ecology.

e. Stormwater discharges from construction sites which disturb 5 acres or more (40 CFR part 122.26(b)(14)(x)) and which discharge to surface waters listed as impaired by the state under Section 303(d) of the Clean Water Act for turbidity, fine sediment, high pH, and/or phosphorus are subject to an effluent limitation that is equal to the applicable water quality standards at the point of discharge. If impairment is due to turbidity and/or fine sediment, the turbidity at the point of discharge shall not exceed the background (upstream) turbidity of the receiving water.

i. Effluent limitations apply to direct discharges to listed waterbodies as well as indirect discharges via a stormwater conveyance system.

ii. All references and requirements associated with Section 303(d) of the Clean Water Act shall use the most current listing by Ecology of impaired waters that exists at the time of application for coverage under this permit

f. Stormwater discharges from construction sites which disturb 5 acres or more (40 CFR part 122.26(b)(14)(x)) and which discharge to surface waters for which there is a total maximum daily load (TMDL) allocation or other control plan that addresses sediment (including turbidity, fine sediment, total suspended solids or siltation), high pH, or phosphorus must be consistent with the requirements in the approved TMDL or applicable control plan. Control plans may be total maximum daily load (TMDL) determinations, restrictions for the protection of endangered species, ground water management plans, or other limitations that regulate or set limits on discharges to a specific waterbody or groundwater recharge area.

Information on impaired waterways is available from the Department of Ecology web site at: http://www.ecy.wa.gov/programs/wq/stormwater. You may also contact the Department of Ecology for more information about impaired waterways at:

Mailing Address:
Department of Ecology
Stormwater Unit
PO Box 47600
Olympia, WA 98504-7600
Phone: 360-407-6000

Physical Address:
Department of Ecology
300 Desmond Drive
Lacey, WA 98503
Phone: 360-407-6000

5. WAR10000I: Indian country within the State of Washington

a. Puyallup Tribe of Indians. The following conditions apply only for projects on the Puyallup Reservation:

i. Each operator shall be responsible for achieving compliance with the Puyallup Tribe's Water Quality Standards.

ii. Each operator shall submit all Pollution Prevention Plans to the Puyallup Tribe Environmental Department for review and approval prior to beginning any discharge activities.

iii. Each operator shall submit a copy of the Notice of Intent to the Puyallup Tribal Environmental Department at the same time it is submitted to EPA.

iv. Storm Water Pollution Prevention Plans and Notices of Intent shall be submitted to:

Puyallup Tribe Natural Resources, Environmental Department
1850 Alexander Avenue
Tacoma, WA 98421

b. Confederated Tribes of the Chehalis Reservation. The following conditions apply only for projects on the Chehalis Reservation:

i. The operator shall be responsible for achieving compliance with the Chehalis Tribe's Water Quality Standards.

ii. The operator shall submit a Storm Water Pollution Prevention Plan to the Chehalis Tribe Department of Natural Resources for review and approval at least thirty (30) days prior to beginning any discharge activities.

iii. The operator shall submit a copy of the Notice of Intent to the Chehalis Tribe Department of Natural Resources at the same time it is submitted to EPA.

iv. Storm Water Pollution Prevention Plans and Notices of Intent shall be submitted to:

Chehalis Tribe Department of Natural Resources
420 Howanut Road
Oakville, WA 98568

Appendix A - Definitions and Acronyms

Definitions

"Arid Areas" means areas with an average annual rainfall of 0 to 10 inches.

"Best Management Practices" (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practice to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

"Commencement of Construction Activities" means the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction-related activities (e.g., stockpiling of fill material).

"Control Measure" as used in this permit, refers to any BMP or other method used to prevent or reduce the discharge of pollutants to waters of the United States.

"CWA" means the Clean Water Act or the Federal Water Pollution Control Act, 33 U.S.C. section 1251 et seq.

"Discharge" when used without qualification means the ''discharge of a pollutant.''

"Discharge of Storm Water Associated with Construction Activity" as used in this permit, refers to a discharge of pollutants in storm water from areas where soil disturbing activities (e.g., clearing, grading, or excavation), construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck washout, fueling), or other industrial storm water directly related to the construction process (e.g., concrete or asphalt batch plants) are located.

"Eligible" means qualified for authorization to discharge storm water under this general permit.

"Facility" or "Activity" means any "point source" or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

"Federal Facility" means any buildings, installations, structures, land, public works, equipment, aircraft, vessels, and other vehicles and property, owned by, or constructed or manufactured for the purpose of leasing to, the Federal government.

"Final Stabilization" means that:

1. All soil disturbing activities at the site have been completed and either of the two following criteria are met:
    a. a uniform (e.g,, evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or
    b. equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.
2. When background native vegetation will cover less than 100 percent of the ground (e.g., arid areas, beaches), the 70 percent coverage criteria is adjusted as follows: if the native vegetation covers 50 percent of the ground, 70 percent of 50 percent (0.70 X 0.50 = 0.35) would require 35 percent total cover for final stabilization. On a beach with no natural vegetation, no stabilization is required.
3. In arid and semi-arid areas only, all soil disturbing activities at the site have been completed and both of the following criteria have been met:
    a. Temporary erosion control measures (e.g., degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years without active maintenance by you,
    b. The temporary erosion control measures are selected, designed, and installed to achieve 70 percent vegetative coverage within three years.
4. For individual lots in residential construction, final stabilization means that either:
    a. The homebuilder has completed final stabilization as specified above, or

b. The homebuilder has established temporary stabilization including perimeter controls for an individual lot prior to occupation of the home by the homeowner and informing the homeowner of the need for, and benefits of, final stabilization.

5. For construction projects on land used for agricultural purposes (e.g., pipelines across crop or range land, staging areas for highway construction, etc.), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to ‘‘water of the United States,’’ and areas which are not being returned to their preconstruction agricultural use must meet the final stabilization criteria (1) or (2) or (3) above.

“Indian country” is defined at 40 CFR §122.2 to mean:

1. All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation;
2. All dependent Indian communities with the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and
3. All Indian allotments, the Indian titles to which have not been extinquished, including rights-of-ways running through the same.

“Large Construction Activity” is defined at 40 CFR §122.26(b)(14)(x) and incorporated here by reference. A large construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than five acres of land or will disturb less than five acres of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than five acres. Large construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

“Municipal Separate Storm Sewer System” or “MS4" is defined at 40 CFR §122.26(b)(8) to mean a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

1. Owned and operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
2. Designed or used for collecting or conveying storm water;
3. Which is not a combined sewer; and
4. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR §122.2.

“New Project” means the “commencement of construction activities” occurs after the effective date of this permit.

“Ongoing Project” means the “commencement of construction activities” occurs before the effective date of this permit.

“Operator” for the purpose of this permit and in the context of storm water associated with construction activity, means any party associated with a construction project that meets either of the following two criteria:

1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
2. The party has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions). This definition is provided to inform permittees of EPA’s interpretation of how the regulatory definitions of ‘‘owner or operator’’ and ‘‘facility or activity’’ are applied to discharges of storm water associated with construction activity.

“Owner or operator” means the owner or operator of any ‘‘facility or activity’’ subject to regulation under the NPDES program.

"Permitting Authority" means the United States Environmental Protection Agency, EPA, a Regional Administrator of the Environmental Protection Agency or an authorized representative.

"Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

"Pollutant" is defined at 40 CFR §122.2. A partial listing from this definition includes: dredged spoil, solid waste, sewage, garbage, sewage sludge, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or municipal waste.

"Project Area" means:

- The areas on the construction site where storm water discharges originate and flow toward the point of discharge into the receiving waters (including areas where excavation, site development, or other ground disturbance activities occur) and the immediate vicinity. (Example: 1. Where bald eagles nest in a tree that is on or bordering a construction site and could be disturbed by the construction activity or where grading causes storm water to flow into a small wetland or other habitat that is on the site that contains listed species.)
- The areas where storm water discharges flow from the construction site to the point of discharge into receiving waters. (Example: Where storm water flows into a ditch, swale, or gully that leads to receiving waters and where listed species (such as amphibians) are found in the ditch, swale, or gully.)
- The areas where storm water from construction activities discharge into receiving waters and the areas in the immediate vicinity of the point of discharge. (Example: Where storm water from construction activities discharges into a stream segment that is known to harbor listed aquatic species.)
- The areas where storm water BMPs will be constructed and operated, including any areas where storm water flows to and from BMPs. (Example: Where a storm water retention pond would be built.)
- The areas upstream and /or downstream from construction activities discharges into a stream segment that may be affected by the said discharges. (Example: Where sediment discharged to a receiving stream settles downstream and impacts a breeding area of a listed aquatic species.)

"Receiving water" means the "Water of the United States" as defined in 40 CFR §122.2 into which the regulated storm water discharges.

"Runoff coefficient" means the fraction of total rainfall that will appear at the conveyance as runoff.

"Semi-Arid Areas" means areas with an average annual rainfall of 10 to 20 inches.

"Site" means the land or water area where any "facility or activity" is physically located or conducted, including adjacent land used in connection with the facility or activity.

"Small Construction Activity" is defined at 40 CFR §122.26(b)(15) and incorporated here by reference. A small construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than one (1) acre and less than five (5) acres of land or will disturb less than one (1) acre of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than one (1) acre and less than five (5) acres. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

"Storm Water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

"Storm Water Discharge-Related Activities" as used in this permit, include: activities that cause, contribute to, or result in storm water point source pollutant discharges, including but not limited to: excavation, site development, grading and other surface disturbance activities; and measures to control storm water including the siting, construction and operation of BMPs to control, reduce or prevent storm water pollution.

"Total Maximum Daily Load" or "TMDL" means the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure.

"Waters of the United States" is as defined at 40 CFR §122.2.

"Wetland" means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

ACRONYMS

BMP - Best Management Practices

CGP - Construction General Permit

CFR - Code of Federal Regulations

CWA - Clean Water Act

EPA - United States Environmental Protection Agency

ESA - Endangered Species Act

FWS - United States Fish and Wildlife Service

MS4 - Municipal Separate Storm Sewer System

MSGP - Multi-Sector General Permit

NHPA - National Historic Preservation Act

NMFS - United States National Marine Fisheries Service

NOI - Notice of Intent

NOT - Notice of Termination

NPDES - National Pollutant Discharge Elimination System

POTW - Publicly Owned Treatment Works

SHPO - State Historic Preservation Officer

SWPPP - Storm Water Pollution Prevention Plan

THPO - Tribal Historic Preservation Officer

TMDL - Total Maximum Daily Load

WQS - Water Quality Standard

Appendix B - Permit Areas Eligible for Coverage

Permit coverage for storm water discharges from construction activity occurring within the following areas is provided by legally separate and distinctly numbered permits:

1. EPA Region 1: CT, MA, ME, NH, RI, VT

US EPA, Region 01
Office of Ecosystem Protection
NPDES Storm Water Program
1 Congress St, Suite 1100 (CMU)
Boston, MA 02114-2023

The States of Connecticut, Maine, Rhode Island, and Vermont are the NPDES Permitting Authority for the majority of discharges within their respective states. The 1998 CGP was issued in the State of Massachusetts on February 17, 1998 (63 FR 78116) and the terms and conditions of the 1998 permit are effective for large construction activities in Massachusetts until further noticed. EPA will reissue this permit for the State of Massachusetts and for Indian Country within the State of Massachusetts for both large and small construction activities at a future date.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
CTR10000I	Indian country within the State of Connecticut
NHR100000	State of New Hampshire
RIR10000I	Indian country within the State of Rhode Island
VTR10000F	Federal Facilities in the State of Vermont

2. EPA Region 2: NJ, NY, PR, VI

For NJ, NY, and VI:

US EPA, Region 02
NPDES Storm Water Program
290 Broadway, 24th Floor
New York, NY 10007-1866

For PR:

US EPA, Region 02
Caribbean Environmental Protection Division
NPDES Storm Water Program
1492 Ponce de Leon Ave
Central Europa Building, Suite 417
San Juan, PR 00907-4127

The State of New York is the NPDES Permitting Authority for the majority of discharges within its state. The State of New Jersey and the Virgin Islands are the NPDES Permitting Authority for all discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
NYR10000I	Indian country within the State of New York
PRR100000	The Commonwealth of Puerto Rico

3. EPA Region 3: DE, DC, MD, PA, VA, WV

US EPA, Region 03
NPDES Storm Water Program
1650 Arch St
Philadelphia, PA 19103

The State of Delaware is the NPDES Permitting Authority for the majority of discharges within its state. Maryland, Pennsylvania, Virginia, and West Virginia are the NPDES Permitting Authority for all discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
DCR100000	The District of Columbia
DER10000F	Federal Facilities in the State of Delaware

4. EPA Region 4: AL, FL, GA, KY, MS, NC, SC, TN

US EPA, Region 04
Water Management Division
NPDES Storm Water Program
61 Forsyth St SW
Atlanta, GA 30303-3104

Coverage Not Available. Construction activities in Region 4 must obtain permit coverage under an alternative permit.

5. EPA Region 5: IL, IN, MI, MN, OH, WI

US EPA, Region 05
NPDES & Technical Support
NPDES Storm Water Program
77 W Jackson Blvd
(WN-16J)
Chicago, IL 60604-3507

The States of Michigan, Minnesota, and Wisconsin are the NPDES Permitting Authority for the majority of discharges within their respective states. The States of Illinois, Indiana, and Ohio are the NPDES Permitting Authorities for all discharges within their respective states.

Permit No.	Areas of coverage/where EPA is Permitting Authority
MIR10000I	Indian country within the State of Michigan
MNR10000I	Indian country within the State of Minnesota
WIR10000I	Indian country within the State of Wisconsin, except the Sokaogon Chippewa (Mole Lake) Community.

6. EPA Region 6: AR, LA, OK, TX, NM (except see Region 9 for Navajo lands, and see Region 8 for Ute Mountain Reservation lands)

US EPA, Region 06
NPDES Storm Water Program
1445 Ross Ave, Suite 1200
Dallas, TX 75202-2733

The States of Louisiana, Oklahoma, and Texas are the NPDES Permitting Authority for the majority of discharges within their respective state. The State of Arkansas is the NPDES Permitting Authority for all discharges within its respective state.

Permit No.	Areas of coverage/where EPA is Permitting Authority
LAR15000I	Indian country within the State of Louisiana
NMR150000	The State of New Mexico, except Indian country
NMR15000I	Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10000I and Ute Mountain Reservation Lands that are covered under Colorado permit COR10000I.
OKR15000I	Indian country within the State of Oklahoma
OKR15000F	Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).
TXR15000F	Discharges in the State of Texas that are not under the authority of the Texas Commission on Environmental Quality (formerly TNRCC), including activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline.
TXR15000I	Indian country within the State of Texas.

7. EPA Region 7: IA, KS, MO, NE (except see Region 8 for Pine Ridge Reservation Lands)

US EPA, Region 07
NPDES Storm Water Program
901 N 5th St
Kansas City, KS 66101

The States of Iowa, Kansas, and Nebraska are the NPDES Permitting Authority for the majority of discharges within their respective states. The State of Missouri is the NPDES Permitting Authority for all discharges within its state.

Permit No.	Areas of coverage/where EPA is Permitting Authority
IAR10000I	Indian country within the State of Iowa
KSR10000I	Indian country within the State of Kansas
NER10000I	Indian country within the State of Nebraska, except Pine Ridge Reservation lands (see Region 8)

8. EPA Region 8: CO, MT, ND, SD, WY, UT (except see Region 9 for Goshute Reservation and Navajo Reservation Lands), the Ute Mountain Reservation in NM, and the Pine Ridge Reservation in NE.

US EPA, Region 08
NPDES Storm Water Program
999 18th St, Suite 300
(EPR-EP)
Denver, CO 80202-2466

The States of Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming are the NPDES Permitting Authority for the majority of discharges within their respective states.

Permit No.	Areas of coverage/where EPA is Permitting Authority
COR10000F	Federal Facilities in the State of Colorado, except those located on Indian country
COR10000I	Indian country within the State of Colorado, as well as the portion of the Ute Mountain Reservation located in New Mexico
MTR10000I	Indian country within the State of Montana
NDR10000I	Indian country within the State of North Dakota, as well as that portion of the Standing Rock Reservation located in South Dakota (except for the portion of the lands within the former boundaries of the Lake Traverse Reservation which is covered under South Dakota permit SDR10000I listed below)
SDR10000I	Indian country within the State of South Dakota, as well as the portion of the Pine Ridge Reservation located in Nebraska and the portion of the lands within the former boundaries of the Lake Traverse Reservation located in North Dakota (except for the Standing Rock Reservation which is covered under North Dakota permit NDR10000I listed above)
UTR10000I	Indian country within the State of Utah, except Goshute and Navajo Reservation lands (see Region 9)
WYR10000I	Indian country within the State of Wyoming

9. EPA Region 9: CA, HI, NV, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, the Goshute Reservation in UT and NV, the Navajo Reservation in UT, NM, and AZ, the Duck Valley Reservation in ID, and the Fort McDermitt Reservation in OR.

US EPA, Region 09
NPDES Storm Water Program
75 Hawthorne St
San Francisco, CA 94105-3901

The States of Arizona, California and Nevada are the NPDES Permitting Authority for the majority of discharges within their respective states. The State of Hawaii is the NPDES Permitting Authority for all discharges within its state.

Permit No.	Areas of coverage/where EPA is Permitting Authority
ASR100000	The Island of American Samoa
AZR10000I	Indian country within the State of Arizona, as well as Navajo Reservation lands in New Mexico and Utah
CAR10000I	Indian country within the State of California
GUR100000	The Island of Guam
JAR100000	Johnston Atoll
MWR100000	Midway Island and Wake Island
NIR100000	Commonwealth of the Northern Mariana Islands
NVR10000I	Indian country within the State of Nevada, as well as the Duck Valley Reservation in Idaho, the Fort McDermitt Reservation in Oregon and the Goshute Reservation in Utah

10. EPA Region 10: AK, WA, ID (except see Region 9 for Duck Valley Reservation Lands), and OR (except see Region 9 for Fort McDermitt Reservation).

US EPA, Region 10
NPDES Storm Water Program
1200 6th Ave (OW-130)
Seattle, WA 98101-1128
Phone: (206) 553-6650

The States of Oregon and Washington are the NPDES Permitting Authority for the majority of discharges within their respective states.

Permit No.	Areas of coverage/where EPA is Permitting Authority
AKR100000	The State of Alaska, except Indian country
AKR10000I	Indian country within the state of Alaska
IDR100000	The State of Idaho, except Indian country
IDR10000I	Indian country within the State of Idaho, except Duck Valley Reservation lands (see Region 9)
ORR10000I	Indian country within the State of Oregon, except Fort McDermitt Reservation lands (see Region 9)
WAR10000F	Federal Facilities in the State of Washington, except those located on Indian country
WAR10000I	Indian country within the State of Washington

Appendix C - Endangered Species Act Review Procedures

You must meet at least one of the six criteria in Subpart 1.3.C.6 to be eligible for coverage under this permit. You must follow the procedures in this Appendix to assess the potential effects of storm water discharges and storm water discharge-related activities on listed species and their critical habitat. When evaluating these potential effects, operators must evaluate the entire project area.

For purposes of this Appendix, the term "project area" is inclusive of the term "Action Area." Action area is defined in 50 CFR §402.02 as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. This includes areas beyond the footprint of the construction area that may be affected by storm water discharges and storm water discharge related activities. "Project area" is defined in Appendix A.

(Operators who are eligible and able to certify eligibility under Criterion B, C, D, or F of Subpart 1.3.C.6 because of a previously issued ESA section 10 permit, a previously completed ESA section 7 consultation, or because the operator's activities were already addressed in another operator's certification of eligibility may proceed directly to Step Four.)

Step One: Determine if Listed Threatened or Endangered Species are Present On or Near Your Project Area

You must determine, to the best of your knowledge, whether listed species are located on or near your project area. To make this determination, you should:

- Determine if listed species are in your county or township. The local offices of the U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), and State or Tribal Heritage Centers often maintain lists of federally listed endangered or threatened species on their internet sites. Visit www.epa.gov/npdes/stormwater/cgp to find the appropriate site for your state or check with your local office. In most cases, these lists allow you to determine if there are listed species in your county or township.
- If there are listed species in your county or township, check to see if critical habitat has been designated and if that area overlaps or is near your project area.
- Contact your local FWS, NMFS, or State or Tribal Heritage Center to determine if the listed species could be found on or near your project area and if any critical habitat areas have been designated that overlap or are near your project area. Critical habitat areas maybe designated independently from the listed species for your county, so even if there are no listed species in your county or township, you must still contact one of the agencies mentioned above to determine if there are any critical habitat areas on or near your project area.

You can also find critical habitat designations and associated requirements at 50 CFR Parts 17 and 226. http://www.access.gpo.gov.

- If there are no listed species in your county or township, no critical habitat areas on or near your project area, or if your local FWS, NMFS, or State or Tribal Heritage Center indicates that listed species are not a concern in your part of the county or township, you may check box A on the Notice of Intent Form.
- If there are listed species and if your local FWS, NMFS, or State or Tribal Heritage Center indicates that these species could exist on or near your project area, you will need to do one or more of the following:
    - Conduct visual inspections: This method may be particularly suitable for construction sites that are smaller in size or located in non-natural settings such as highly urbanized areas or industrial parks where there is little or no natural habitat, or for construction activities that discharge directly into municipal storm water collection systems.
    - Conduct a formal biological survey. In some cases, particularly for larger construction sites with extensive storm water discharges, biological surveys may be an appropriate way to assess whether species are located on or near the project area and whether there are likely adverse effects to such species. Biological surveys are frequently performed by environmental consulting firms. A biological survey may in some cases be useful in conjunction with Steps Two, Three, or Four of these instructions.
    - Conduct an environmental assessment under the National Environmental Policy Act (NEPA). Such reviews may indicate if listed species are in proximity to the project area. Coverage under the CGP does not trigger such a review because the CGP does not regulate new sources (that is, dischargers subject to New Source Performance Standards under section 306 of the Clean Water Act), and is thus statutorily

exempted from NEPA. See CWA section 511(c). However, some construction activities might require review under NEPA for other reasons such as federal funding or other federal involvement in the project.

If listed threatened or endangered species or critical habitat are present in the project area, you must look at impacts to species and/or habitat when following Steps Two through Four. Note that many but not all measures imposed to protect listed species under these steps will also protect critical habitat. Thus, meeting the eligibility requirements of this CGP may require measures to protect critical habitat that are separate from those to protect listed species.

Step Two: Determine if the Construction Activity's Storm Water Discharges or Storm Water Discharge-Related Activities Are Likely to Adversely Affect Listed Threatened or Endangered Species or Designated Critical Habitat

To receive CGP coverage, you must assess whether your storm water discharges or storm water discharge-related activities is likely to adversely affect listed threatened or endangered species or designated critical habitat that are present on or near your project area.

Potential adverse effects from storm water discharges and storm water discharge-related activities include:

- *Hydrological.* Storm water discharges may cause siltation, sedimentation or induce other changes in receiving waters such as temperature, salinity or pH. These effects will vary with the amount of storm water discharged and the volume and condition of the receiving water. Where a storm water discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely. Construction activity itself may also alter drainage patterns on a site where construction occurs that can impact listed species or critical habitat.
- *Habitat.* Excavation, site development, grading, and other surface disturbance activities from construction activities, including the installation or placement of storm water BMPs, may adversely affect listed species or their habitat. Storm water may drain or inundate listed species habitat.
- *Toxicity.* In some cases, pollutants in storm water may have toxic effects on listed species.

The scope of effects to consider will vary with each site. If you are having difficulty determining whether your project is likely to adversely affect listed species or critical habitat, or one of the Services has already raised concerns to you, you must contact the appropriate office of the FWS, NMFS or Natural Heritage Center for assistance. If adverse effects are not likely, then you may check box E on the NOI form and apply for coverage under the CGP. If the discharge may adversely effect listed species or critical habitat, you must follow Step Three.

Step Three: Determine if Measures Can Be Implemented to Avoid Adverse Effects

If you make a preliminary determination that adverse effects are likely to occur, you can still receive coverage under Criterion E of Subpart 1.3.C.6 of the CGP if appropriate measures are undertaken to avoid or eliminate the likelihood of adverse effects prior to applying for CGP coverage. These measures may involve relatively simple changes to construction activities such as re-routing a storm water discharge to bypass an area where species are located, relocating BMPs, or by changing the "footprint" of the construction activity. You should contact the FWS and/or NMFS to see what appropriate measures might be suitable to avoid or eliminate the likelihood of adverse impacts to listed species and/or critical habitat. (See 50 CFR §402.13(b)). This can entail the initiation of informal consultation with the FWS and/or NMFS (described in more detail in Step Four).

If you adopt measures to avoid or eliminate adverse affects, you must continue to abide by those measures for the duration of the construction project and coverage under the CGP. These measures must be described in the SWPPP and are enforceable CGP conditions and/or conditions for meeting the eligibility criteria in Subpart 1.3. If appropriate measures to avoid the likelihood of adverse effects are not available, you must follow Step Four.

Step Four: Determine if the Eligibility Requirements of Criterion B, C, D, or F of Subpart 1.3.C.6 Can Be Met

Where adverse effects are likely, you must contact the FWS and/or NMFS. You may still be eligible for CGP coverage if any likely adverse effects can be addressed through meeting Criterion B, C, D, or F of Subpart 1.3.C.6 of the CGP. These criteria are as follows:

1. *An ESA Section 7 Consultation Is Performed for Your Activity (See Criterion B or C of Subpart 1.3.C.6 of the CGP).*

Formal or informal ESA section 7 consultation is performed with the FWS and/or NMFS that addresses the effects of your storm water discharges and storm water discharge-related activities on federally-listed and threatened

species and designated critical habitat. FWS and/or NMFS may request that consultation take place if any actions are identified that may affect listed species or critical habitat. In order to be eligible for coverage under this permit, consultation must result in a "no jeopardy opinion" or a written concurrence by the Service(s) on a finding that your storm water discharge(s) and storm water discharge-related activities are not likely to adversely affect listed species or critical habitat (For more information on consultation, see 50 CFR §402). If you receive a "jeopardy opinion," you may continue to work with the FWS and/or NMFS and your permitting authority to modify your project so that it will not jeopardize listed species or designated critical habitat.

Most consultations are accomplished through informal consultation. By the terms of this CGP, EPA has automatically designated operators as non-federal representatives for the purpose of conducting informal consultations. See Subpart 1.3.C.6 and 50 CFR §402.08 and §402.13. When conducting informal ESA section 7 consultation as a non-federal representative, you must follow the procedures found in 50 CFR Part 402 of the ESA regulations. You must notify FWS and/or NMFS of your intention and agreement to conduct consultation as a non-federal representative.

Consultation may occur in the context of another federal action at the construction site (e.g., where ESA section 7 consultation was performed for issuance of a wetlands dredge and fill permit for the project or where a NEPA review is performed for the project that incorporates a section 7 consultation). Any terms and conditions developed through consultations to protect listed species and critical habitat must be incorporated into the SWPPP. As noted above, operators may, if they wish, initiate consultation with the Services at Step Four.

Whether ESA section 7 consultation must be performed with either the FWS, NMFS or both Services depends on the listed species that may be affected by the operator's activity. In general, NMFS has jurisdiction over marine, estuaries, and anadromous species. Operators should also be aware that while formal section 7 consultation provides protection from incidental takings liability, informal consultation does not.

2. *An Incidental Taking Permit Under Section 10 of the ESA is Issued for the Operators Activity (See Criterion D of Subpart 1.3.C.6 of the CGP).*

Your construction activities are authorized through the issuance of a permit under section 10 of the ESA and that authorization addresses the effects of your storm water discharge(s) and storm water discharge-related activities on federally-listed species and designated critical habitat. You must follow FWS and/or NMFS procedures when applying for an ESA Section 10 permit (see 50 CFR §17.22(b)(1) for FWS and §222.22 for NMFS). Application instructions for section 10 permits for FWS and NMFS can be obtained by accessing the FWS and NMFS websites (http://www.fws.gov and http://www.nmfs.noaa.gov) or by contacting the appropriate FWS and NMFS regional office.

3. *You are Covered Under the Eligibility Certification of Another Operator for the Project Area (See Criterion F of Subpart 1.3.C.6 of the CGP).*

Your storm water discharges and storm water discharge-related activities were already addressed in another operator's certification of eligibility under Criteria A through E of Subpart 1.3.C.6 which also included your project area. For example, a general contractor or developer may have completed and filed an NOI for the entire project area with the necessary Endangered Species Act certifications (criteria A-E), subcontractors may then rely upon that certification and must comply with any conditions resulting from that process. By certifying eligibility under Criterion F of Subpart 1.3.C.6, you agree to comply with any measures or controls upon which the other operator's certification under Criterion B, C, or D of Subpart 1.3.C.6 was based. Certification under Criterion F of Subpart 1.3.C.6 is discussed in more detail in the Fact Sheet that accompanies this permit.

You must comply with any terms and conditions imposed under the eligibility requirements of Criterion A through F to ensure that your storm water discharges and storm water discharge-related activities are protective of listed species and/or critical habitat. Such terms and conditions must be incorporated in the project's SWPPP. If the eligibility requirements of Subpart 1.3.C.6 cannot be met, then you are not eligible for coverage under the CGP. In these instances, you may consider applying to EPA for an individual permit.

Appendix D - Small Construction Waivers and Instructions

These waivers are only available to storm water discharges associated with small construction activities (i.e., 1-5 acres). As the operator of a small construction activity, you may be able to qualify for a waiver in lieu of needing to obtain coverage under this general permit based on: (A) a low rainfall erosivity factor, (B) a TMDL analysis, or (C) an equivalent analysis that determines allocations for small construction sites are not needed. Each operator, otherwise needing permit coverage, must notify EPA of its intention for a waiver. It is the responsibility of those individuals wishing to obtain a waiver from coverage under this general permit to submit a complete and accurate waiver certification as described below. Where the operator changes or another is added during the construction project, the new operator must also submit a waiver certification to be waived.

A. Rainfall Erosivity Waiver

Under this scenario the small construction project's rainfall erosivity factor calculation ("R" in the Revised Universal Soil Loss Equation) is less than 5 during the period of construction activity. The operator must certify to the Permitting Authority that construction activity will occur only when the rainfall erosivity factor is less than 5. The period of construction activity begins at initial earth disturbance and ends with final stabilization. Where vegetation will be used for final stabilization, the date of installation of a stabilization practice that will provide interim non-vegetative stabilization can be used for the end of the construction period, provided the operator commits (as a condition of waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization as defined in the construction general permit have been met. If use of this interim stabilization eligibility condition was relied on to qualify for the waiver, signature on the waiver with its certification statement constitutes acceptance of and commitment to complete the final stabilization process. The operator must submit a waiver certification to EPA prior to commencing construction activities.

> *Note: The rainfall erosivity factor "R" is determined in accordance with Chapter 2 of Agriculture Handbook Number 703, Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE), pages 21–64, dated January 1997; United States Department of Agriculture (USDA), Agricultural Research Service.*

EPA funded a cooperative agreement with Texas A&M University to develop an online rainfall erosivity calculator. You can access the calculator from EPA's website at: www.epa.gov/npdes/stormwater/cgp. Use of the calculator allows you to determine potential eligibility for the rainfall erosivity waiver. It may also be useful in determining the time periods during which construction activity could be waived from permit coverage. You may find that moving your construction activity by a few weeks or expediting site stabilization will allow you to qualify for the waiver.

If you are the operator of the construction activity and eligible for a waiver based on low erosivity potential, you must provide the following information on the waiver certification in order to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operators;
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The rainfall erosivity factor calculation that applies to the active construction phase at your project site; and
5. A statement, signed and dated by an authorized representative as provided in Appendix G, Subsection 11, that certifies that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five.

At the time of publication, a Low Erosivity Waiver Form is not available. If EPA does create a form, it will be noticed (either directly, by public notice, or by making information available on the Internet at www.epa.gov/npdes/stormwater/cgp.

> *Note: If the R factor is 5 or greater, you cannot apply for the rainfall erosivity waiver, and must apply for permit coverage as per Subpart 2.1 of the construction general permit, unless you qualify for the Water Quality Waiver as described below.*

If your small construction project continues beyond the projected completion date given on the waiver certification, you must recalculate the rainfall erosivity factor for the new project duration. If the R factor is below five (5), you

must update all applicable information on the waiver certification and retain a copy of the revised waiver as part of the site SWPPP. The new waiver certification must be submitted prior to the projected completion date listed on the original waiver form to assure your exemption from permitting requirements is uninterrupted. If the new R factor is five (5) or above, you must submit an NOI as per Part 2.

B. TMDL Waiver

This waiver is available if EPA has established or approved a TMDL that addresses the pollutant(s) of concern and has determined that controls on storm water discharges from small construction activity are not needed to protect water quality. The pollutant(s) of concern include sediment (such as total suspended solids, turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the construction activity. Information on TMDLs that have been established or approved by EPA is available from EPA online at http://www.epa.gov/owow/tmdl/ and from state and tribal water quality agencies.

If you are the operator of the construction activity and eligible for a waiver based on compliance with an EPA established or approved TMDL, you must provide the following information on the Waiver Certification form in order to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the water body(s) that would be receiving storm water discharges from your construction project;
5. The name and approval date of the TMDL;
6. A statement, signed and dated by an authorized representative as provided in Appendix G, Subsection 11, that certifies that the construction activity will take place and that the storm water discharges will occur, within the drainage area addressed by the TMDL.

C. Equivalent Analysis Waiver

This waiver is available for non-impaired waters only. The operator can develop an equivalent analysis that determines allocations for his small construction site for the pollutant(s) of concern or determines that such allocations are not needed to protect water quality. This waiver requires a small construction operator to develop an equivalent analysis based on existing in-stream concentrations, expected growth in pollutant concentrations from all sources, and a margin of safety.

If you are a construction operator who wants to use this waiver, you must develop your equivalent analysis and provide the following information to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2 Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3 Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the water bodies that would be receiving storm water discharges from your construction project;
5. Your equivalent analysis;
6. A statement, signed and dated by an authorized representative as provided in Appendix G, Subsection 11, that certifies that the construction activity will take place and that the storm water discharges will occur, within the drainage area addressed by the equivalent analysis.

D. Waiver Deadlines and Submissions

1. Waiver certifications must be submitted prior to commencement of construction activities.

2. If you submit a TMDL or equivalent analysis waiver request, you are not waived until EPA approves your request. As such, you may not commence construction activities until receipt of approval from EPA.
3. Late Notifications: Operators are not prohibited from submitting waiver certifications after initiating clearing, grading, excavation activities, or other construction activities. The Agency reserves the right to take enforcement for any unpermitted discharges or permit noncompliance that occur between the time construction commenced and waiver authorization is granted.

Submittal of a waiver certification is an optional alternative to obtaining permit coverage for discharges of storm water associated with small construction activity, provided you qualify for the waiver. Any discharge of storm water associated with small construction activity not covered by either a permit or a waiver may be considered an unpermitted discharge under the Clean Water Act. As mentioned above, EPA reserves the right to take enforcement for any unpermitted discharges or permit noncompliance that occur between the time construction commenced and either discharge authorization is granted or a complete and accurate waiver certification is submitted. EPA may notify any operator covered by a waiver that they must apply for a permit. EPA may notify any operator who has been in non-compliance with a waiver that they may no longer use the waiver for future projects. Any member of the public may petition EPA to take action under this provision by submitting written notice along with supporting justification.

Complete and accurate Rainfall Erosivity waiver certifications must be sent to the following address:

Regular U.S. Mail Delivery

EPA Storm Water Notice Processing Center
Mail Code 4203M
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Overnight/Express Mail Delivery

EPA Storm Water Notice Processing Center
Room 7420
U.S. EPA
1201Constitution Avenue, NW
Washington, DC 20004

Complete and accurate TMDL or equivalent analysis waiver requests must be sent to the applicable EPA Region office specified in Appendix B.

Appendix E - Notice of Intent Form and Instructions

From the effective date of this permit, operators are to use the Notice of Intent Form contained in this Appendix to obtain permit coverage.

This Form Replaces Form 3510-9 (8-98)
Refer to the Following Pages for Instructions

Form Approved OMB Nos. 2040-0188 and 2040-0211

NPDES Form

EPA

United States Environmental Protection Agency
Washington, DC 20460

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

Submission of this Notice of Intent (NOI) constitutes notice that the party identified in Section II of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) permit number identified in Section I of this form. Submission of this NOI also constitutes notice that the party identified in Section II of this form meets the eligibility requirements of the CGP for the project identified in Section III of this form. Permit coverage is required prior to commencement of construction activity until you are eligible to terminate coverage as detailed in the CGP. To obtain authorization, you must submit a complete and accurate NOI form. Refer to the instructions at the end of this form.

I. Permit Number

II. Operator Information

Name:

IRS Employer Identification Number (EIN): -

Mailing Address:

Street:

City: State: Zip Code: -

Phone: - - Fax (optional): - -

E-mail (optional):

III. Project/Site Information

Project/Site Name:

Project Street/Location:

City: State: Zip Code: -

County or similar government subdivision:

Latitude/Longitude (Use one of three possible formats, and specify method)

Latitude
1. __° __′ __″ N (degrees, minutes, seconds)
2. __° __.__′ N (degrees, minutes, decimal)
3. __.____° N (decimal)

Longitude
1. ___° __′ __″ W (degrees, minutes, seconds)
2. ___° __.__′ W (degrees, minutes, decimal)
3. ___.____° W (decimal)

Method: U.S.G.S. topographic map EPA web site GPS Other:
• If you used a U.S.G.S. topographic map, what was the scale:

Project Located in Indian country? Yes No
If so, name of Reservation or if not part of a Reservation, put "Not Applicable":

Estimated Project Start Date: / / (Month Date Year)

Estimated Project Completion Date: / / (Month Date Year)

Estimated Area to be Disturbed (to the nearest quarter acre): .

IV. SWPPP Information

Has the SWPPP been prepared in advance of filing this NOI? Yes No

Location of SWPPP for viewing: Address in Section II Address in Section III Other

If Other:

SWPPP Street:

City:

State: Zip Code: -

SWPPP Contact Information (if different than that in Section II):

Name:

Phone: - - Fax (optional): - -

E-mail (optional):

V. Discharge Information

Identify the name(s) of waterbodies to which you discharge.

Is this discharge consistent with the assumptions and requirements of applicable EPA approved or established TMDL(s)?

Yes No

VI. Endangered Species Information

Under which criterion of the permit have you satisfied your ESA eligibility obligations?

A B C D E F

- If you select criterion F, provide permit tracking number of operator under which you are certifying eligibility:

VII. Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name:

Print Title:

Signature:

Date:

Instructions for Completing EPA Form 3510-9

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

NPDES Form | This Form Replaces Form 3510-9 (8/98) | Form Approved OMB Nos. 2040-0188 and 2040-0211

Who Must File an NOI Form
Under the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et.seq.; the Act), federal law prohibits storm water discharges from certain construction activities to waters of the U.S. unless that discharge is covered under a National Pollutant Discharge Elimination System (NPDES) Permit. Operator(s) of construction sites where one or more acres are disturbed, smaller sites that are part of a larger common plan of development or sale where there is a cumulative disturbance of at least one acre, or any other site specifically designated by the Director, must submit an NOI to obtain coverage under an NPDES general permit. Each person, firm, public organization, or any other entity that meets either of the following criteria must file this form: (1) they have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) they have day-to-day operational control of those activities at the project necessary to ensure compliance with SWPPP requirements or other permit conditions. If you have questions about whether you need an NPDES storm water permit, or if you need information to determine whether EPA or your state agency is the permitting authority, refer to *www.epa.gov/npdes/stormwater/cgp* or telephone the Storm Water Notice Processing Center at (866) 352-7755.

Where to File NOI Form
See the applicable CGP for information on where to send your completed NOI form.

Completing the Form
Obtain and read a copy of the appropriate EPA Storm Water Construction General Permit for your area. To complete this form, type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks (abbreviate if necessary to stay within the number of characters allowed for each item). Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, refer to *www.epa.gov/npdes/stormwater/cgp* or telephone the Storm Water Notice Processing Center at (866) 352-7755. Please submit original document with signature in ink - do not send a photocopied signature.

Section I. Permit Number
Provide the number of the permit under which you are applying for coverage (see Appendix B of the general permit for the list of eligible permit numbers).

Section II. Operator Information
Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application. An operator of a project is a legal entity that controls at least a portion of site operations and is not necessarily the site manager. Provide the employer identification number (EIN from the Internal Revenue Service; IRS), also commonly referred to as your taxpayer ID. If the applicant does not have an EIN enter "NA" in the space provided. Also provide the operator's mailing address, telephone number, fax number (optional) and e-mail address (if you would like to be notified via e-mail of NOI approval when available). Correspondence for the NOI will be sent to this address.

Section III. Project/Site Information
Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for permit coverage to be granted.

The applicant must also provide the latitude and longitude of the facility either in degrees, minutes, seconds; degrees, minutes, decimal; or decimal format. The latitude and longitude of your facility can be determined in several different ways, including through the use of global positioning system (GPS) receivers, U.S. Geological Survey (U.S.G.S.) topographic or quadrangle maps, and EPA's web-based siting tools, among others. Refer to *www.epa.gov/npdes/stormwater/cgp* for further guidance on the use of these methodologies. For consistency, EPA requests that measurements be taken from the approximate center of the construction site. Applicants must specify which method they used to determine latitude and longitude. If a U.S.G.S. topographic map is used, applicants are required to specify the scale of the map used.

Indicate whether the project is in Indian country, and if so, provide the name of the Reservation. If the project is in Indian Country Lands that are not part of a Reservation, indicate "not applicable" in the space provided.

Enter the estimated construction start and completion dates using four digits for the year (i.e., 05/27/1998). Enter the estimated area to be disturbed including but not limited to: grubbing, excavation, grading, and utilities and infrastructure installation. Indicate to the nearest quarter acre. Note: 1 acre = 43,560 sq. ft.

Section IV. SWPPP Information
Indicate whether or not the SWPPP was prepared in advance of filing the NOI form. Check the appropriate box for the location where the SWPPP may be viewed. Provide the name,

fax number (optional), and e-mail address (optional) of the contact person if different than that listed in Section II of the NOI form.

Section V. Discharge Information

Enter the name(s) of receiving waterbodies to which the project's storm water will discharge. These should be the first bodies of water that the discharge will reach. (Note: If you discharge to more than one waterbody, please indicate all such waters in the space provided and attach a separate sheet if necessary.) For example, if the discharge leaves your site and travels through a roadside swale or a storm sewer and then enters a stream that flows to a river, the stream would be the receiving waterbody. Waters of the U.S. include lakes, streams, creeks, rivers, wetlands, impoundments, estuaries, bays, oceans, and other surface bodies of water within the confines of the U.S. and U.S. coastal waters. Waters of the U.S. do not include man-made structures created solely for the purpose of wastewater treatment. U.S. Geological Survey topographical maps may be used to make this determination. If the map does not provide a name, use a format such as "unnamed tributary to Cross Creek". If you discharge into a municipal separate storm sewer system (MS4), you must identify the waterbody into which that portion of the storm sewer discharges. That information should be readily available from the operator of the MS4.

Indicate whether your storm water discharges from construction activities will be consistent with the assumptions and requirements of applicable EPA approved or established TMDL(s). To answer this question, refer to *www.epa.gov/npdes/stormwater/cgp* for state- and regional-specific TMDL information related to the construction general permit. You may also have to contact your EPA regional office or state agency. If there are no applicable TMDLs or no related requirements, please check the "yes" box in the NOI form.

Section VI. Endangered Species Information

Indicate for which criterion (i.e., A, B, C, D, E, or F) of the permit the applicant is eligible with regard to protection of federally listed endangered and threatened species, and designated critical habitat. See Part 1.3.C.6 and Appendix C of the permit. If you select criterion F, provide the permit tracking number of the operator under which you are certifying eligibility. The permit tracking number is the number assigned to the operator by the Storm Water Notice Processing Center after EPA acceptance of a complete NOI.

Section VII. Certification Information

All applications, including NOIs, must be signed as follows:
For a corporation: By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name and title of the person signing the form and the date of signing. An unsigned or undated NOI form will not be considered eligible for permit coverage.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 3.7 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch 2136, U.S. Environmental Protection, Agency, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

Appendix F - Notice of Termination Form and Instructions

From the effective date of this permit, operators are to use the Notice of Termination Form contained in this Appendix to terminate permit coverage.

This Form Replaces Form 3517-7 (8-98)
Refer to the Following Page for Instructions

Form Approved OMB Nos. 2040-0086 and 2040-0211

NPDES Form

United States Environmental Protection Agency
Washington, DC 20460

Notice of Termination (NOT) of Coverage Under an NPDES General Permit for Storm Water Discharges Associated with Construction Activity

Submission of this Notice of Termination constitutes notice that the party identified in Section II of this form is no longer authorized to discharge storm water associated with construction activity under the NPDES program from the site identified in Section III of this form. All necessary information must be included on this form. Refer to the instructions at the end of this form.

I. Permit Information

NPDES Storm Water General Permit Tracking Number: _____

Reason for Termination (Check only one):

Final stabilization has been achieved on all portions of the site for which you are responsible.

Another operator has assumed control, according to Appendix G, Section 11.C of the CGP, over all areas of the site that have not been finally stabilized.

Coverage under an alternative NPDES permit has been obtained.

For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

II. Operator Information

Name: _____

IRS Employer Identification Number (EIN): ___ - _____

Mailing Address:

Street: _____

City: _____ State: ___ Zip Code: _____ - _____

Phone: ___ - ___ - ___ Fax (optional): ___ - ___ - ___

E-mail (optional): _____

III. Project/Site Information

Project/Site Name: _____

Project Street/Location: _____

City: _____ State: ___ Zip Code: _____ - _____

County or similar government subdivision: _____

IV. Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name:

Print Title:

Signature:

Date:

Instructions for Completing EPA Form 3510-13

Notice of Termination (NOT) of Coverage Under an NPDES General Permit for Storm Water Discharges Associated with Construction Activity

NPDES Form This Form Replaces Form 3517-7 (8-98) Form Approved OMB Nos. 2040-0086 and 2040-0211

Who May File an NOT Form

Permittees who are presently covered under the EPA-issued National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity may submit an NOT form when final stabilization has been achieved on all portions of the site for which you are responsible; another operator has assumed control in accordance with Appendix G, Section 11.C of the General Permit over all areas of the site that have not been finally stabilized; coverage under an alternative NPDES permit has been obtained; or for residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

"Final stabilization" means that all soil disturbing activities at the site have been completed and that a uniform perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed. See "final stabilization" definition in Appendix A of the Construction General Permit for further guidance where background native vegetation covers less than 100 percent of the ground, in arid or semi-arid areas, for individual lots in residential construction, and for construction projects on land used for agricultural purposes.

Completing the Form

Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, refer to *www.epa.gov/npdes/stormwater/cgp* or telephone the Storm Water Notice Processing Center at (866) 352-7755. Please submit original document with signature in ink - do not send a photocopied signature.

Section I. Permit Number

Enter the existing NPDES Storm Water General Permit Tracking Number assigned to the project by EPA's Storm Water Notice Processing Center. If you do not know the permit tracking number, refer to *www.epa.gov/npdes/stormwater/cgp* or contact the Storm Water Notice Processing Center at (866) 352-7755.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box. Check only one:

Final stabilization has been achieved on all portions of the site for which you are responsible.

Another operator has assumed control according to Appendix G, Section 11.C over all areas of the site that have not been finally stabilized.

Coverage under an alternative NPDES permit has been obtained.

For residential construction only, if temporary stabilization has been completed and the residence has been transferred to the homeowner.

Section II. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application and is covered by the permit tracking number identified in Section I. The operator of the project is the legal entity that controls the site operation, rather than the site manager. Provide the employer identification number (EIN from the Internal Revenue Service; IRS). If the applicant does not have an EIN enter "NA" in the space provided. Enter the complete mailing address and telephone number of the operator. *Optional:* enter the fax number and e-mail address of the operator.

Section III. Project/Site Information

Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for termination of permit coverage to be valid.

Section IV. Certification Information

All applications, including NOIs, must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name and title of the person signing the form and the date of signing. An unsigned or undated NOT form will not be considered valid termination of permit coverage.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 0.5 hours per notice, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460. Include the OMB number on any correspondence. Do not sent the completed form to this address.

Appendix G - Standard Permit Conditions

STANDARD PERMIT CONDITIONS

1. Duty To Comply

You must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

A. You must comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

B. The Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. §2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. §3701 note) (currently $27,500 per day for each violation).

   The Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.

C. Any person may be assessed an administrative penalty by the Administrator for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Pursuant to 40 CFR Part 19 and the Act, administrative penalties for Class I violations are not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. §2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. §3701 note) (currently $11,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $27,500). Pursuant to 40 CFR Part 19 and the Act, penalties for Class II violations are not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. §2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. §3701 note) (currently $11,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $137,500).

2. Duty to Reapply

If you wish to continue an activity regulated by this permit after the expiration date of this permit, you must apply for and obtain a new permit.

3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for you in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. Duty to Mitigate

You must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

5. Proper Operation and Maintenance

You must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by you to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by you only when the operation is necessary to achieve compliance with the conditions of this permit.

6. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. Your filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

7. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privileges.

8. Duty to Provide Information

You must furnish to EPA, within a reasonable time, any information which EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. You must also furnish to EPA upon request, copies of records required to be kept by this permit.

9. Inspection and Entry

You must allow EPA, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

A. Enter upon your premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

B. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

C. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

D. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

10. Monitoring and Records

A. Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity.

B. You must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of EPA at any time.

C. Records of monitoring information must include:

   1. The date, exact place, and time of sampling or measurements;

   2. The individual(s) who performed the sampling or measurements;

   3. The date(s) analyses were performed

4. The individual(s) who performed the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses.

D. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.

E. The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

11. Signatory Requirements

A. All applications, including NOIs, must be signed as follows:

1. For a corporation: By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
2. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or
3. For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

B. All reports required by this permit, including SWPPPs, must be signed by a person described in Appendix G, Subsection 11.A above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described in Appendix G, Subsection 11.A;
2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
3. The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

C. Changes to Authorization. If an authorization under Subpart 2.1 is no longer accurate because a different operator has responsibility for the overall operation of the construction site, a new NOI satisfying the requirements of Subpart 2.1 must be submitted to EPA prior to or together with any reports, information, or applications to be signed by an authorized representative. The change in authorization must be submitted within the time frame specified in Subpart 2.2, and sent to the address specified in Subpart 2.3.

D. Any person signing documents required under the terms of this permit must include the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is,

to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

E. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

12. Reporting Requirements

A. Planned changes. You must give notice to EPA as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR §122.29(b); or
2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR §122.42(a)(1).

B. Anticipated noncompliance. You must give advance notice to EPA of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

C. Transfers. This permit is not transferable to any person except after notice to EPA. EPA may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Clean Water Act. (See 40 CFR §122.61; in some cases, modification or revocation and reissuance is mandatory.)

D. Monitoring reports. Monitoring results must be reported at the intervals specified elsewhere in this permit.

1. Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by EPA for reporting results of monitoring of sludge use or disposal practices.
2. If you monitor any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by EPA.
3. Calculations for all limitations which require averaging of measurements must use an arithmetic mean.

E. Compliance schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.

F. Twenty-four hour reporting.

1. You must report any noncompliance which may endanger health or the environment. Any information must be provided orally within 24 hours from the time you become aware of the circumstances. A written submission must also be provided within five days of the time you become aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
2. The following shall be included as information which must be reported within 24 hours under this paragraph.
   a. Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)
   b. Any upset which exceeds any effluent limitation in the permit
   c. Violation of a maximum daily discharge limitation for any of the pollutants listed by EPA in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)

3. EPA may waive the written report on a case-by-case basis for reports under Appendix G, Subsection 12.F.2 if the oral report has been received within 24 hours.

G. Other noncompliance. You must report all instances of noncompliance not reported under Appendix G, Subsections 12.D, 12.E, and 12.F, at the time monitoring reports are submitted. The reports must contain the information listed in Appendix G, Subsection 12.F.

H. Other information. Where you become aware that you failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Permitting Authority, you must promptly submit such facts or information.

13. Bypass

A. Definitions.

1. Bypass means the intentional diversion of waste streams from any portion of a treatment facility

2. Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

B. Bypass not exceeding limitations. You may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Appendix G, Subsections 13.C and 13.D.

C. Notice–

1. Anticipated bypass. If you know in advance of the need for a bypass, you must submit prior notice, if possible at least ten days before the date of the bypass.

2. Unanticipated bypass. You must submit notice of an unanticipated bypass as required in Appendix G, Subsection 12.F (24-hour notice).

D. Prohibition of bypass.

1. Bypass is prohibited, and EPA may take enforcement action against you for bypass, unless:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

c. You submitted notices as required under Appendix G, Subsection 13.C.

2. EPA may approve an anticipated bypass, after considering its adverse effects, if EPA determines that it will meet the three conditions listed above in Appendix G, Subsection 13.D.1.

14. Upset

A. Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

B. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Appendix G, Subsection 14.C are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

C. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and that you can identify the cause(s) of the upset;

2. The permitted facility was at the time being properly operated; and

3. You submitted notice of the upset as required in Appendix G, Subsection 12.F.2.b(24 hour notice).
4. You complied with any remedial measures required under Appendix G, Section 4.

D. Burden of proof. In any enforcement proceeding, you, as the one seeking to establish the occurrence of an upset, has the burden of proof.

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SECTION 01572

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT
02/03

PART 1 GENERAL

1.1 GOVERNMENT POLICY

Government policy is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that policy the Contractor shall: (1) practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse.

1.2 MANAGEMENT

The Contractor shall take a pro-active, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort. Construction and demolition waste includes products of demolition or removal, excess or unusable construction materials, packaging materials for construction products, and other materials generated during the construction process but not incorporated into the work. In the management of waste consideration shall be given to the availability of viable markets, the condition of the material, the ability to provide the material in suitable condition and in a quantity acceptable to available markets, and time constraints imposed by internal project completion mandates. The Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling of waste. Revenues or other savings obtained for salvage, or recycling shall accrue to the Contractor. Firms and facilities used for recycling, reuse, and disposal shall be appropriately permitted for the intended use to the extent required by federal, state, and local regulations.

1.3 PLAN

A waste management plan shall be submitted within 15 days after notice to proceed and prior to initiating any site preparation work. The plan shall include the following:

a. Name of individuals on the Contractor's staff responsible for waste prevention and management.

b. Actions that will be taken to reduce solid waste generation.

c. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas and equipment to be used for processing, sorting, and temporary storage of wastes.

d. Characterization, including estimated types and quantities, of the waste to be generated.

e. Name of landfill and/or incinerator to be used and the estimated

costs for use, assuming that there would be no salvage or recycling on the project.

f. Identification of local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity.

g. List of specific waste materials that will be salvaged for resale, salvaged and reused, or recycled. Recycling facilities that will be used shall be identified.

h. Identification of materials that cannot be recycled/reused with an explanation or justification.

i. Anticipated net cost savings determined by subtracting Contractor program management costs and the cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.

1.4 RECORDS

Records shall be maintained to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. The records shall be made available to the Contracting Officer during construction, and a copy of the records shall be delivered to the Contracting Officer upon completion of the construction.

1.5 COLLECTION

The necessary containers, bins and storage areas to facilitate effective waste management shall be provided and shall be clearly and appropriately identified. Recyclable materials shall be handled to prevent contamination of materials from incompatible products and materials and separated by one of the following methods:

1.5.1 Source Separated Method.

Waste products and materials that are recyclable shall be separated from trash and sorted into appropriately marked separate containers and then transported to the respective recycling facility for further processing.

1.5.2 Co-Mingled Method.

Waste products and recyclable materials shall be placed into a single container and then transported to a recycling facility where the recyclable materials are sorted and processed.

1.5.3 Other Methods.

Other methods proposed by the Contractor may be used when approved by the Contracting Officer.

1.6 DISPOSAL

Except as otherwise specified in other sections of the specifications, disposal shall be in accordance with the following:

1.6.1 Reuse.

First consideration shall be given to salvage for reuse since little or no re-processing is necessary for this method, and less pollution is created when items are reused in their original form. Sale or donation of waste suitable for reuse shall be considered. Salvaged materials, other than those specified in other sections to be salvaged and reinstalled, shall not be used in this project.

1.6.2 Recycle.

Waste materials not suitable for reuse, but having value as being recyclable, shall be made available for recycling whenever economically feasible.

1.6.3 Waste.

Materials with no practical use or economic benefit shall be disposed at a landfill or incinerator.

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12/01

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SECTION 01670

RECYCLED / RECOVERED MATERIALS

12/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 247	Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.2 OBJECTIVES

Government procurement policy is to acquire, in a cost effective manner, items containing the highest percentage of recycled and recovered materials practicable consistent with maintaining a satisfactory level of competition without adversely affecting performance requirements or exposing suppliers' employees to undue hazards from the recovered materials. The Environmental Protection Agency (EPA) has designated certain items which must contain a specified percent range of recovered or recycled materials. EPA designated products specified in this contract comply with the stated policy and with the EPA guidelines. The Contractor shall make all reasonable efforts to use recycled and recovered materials in providing the EPA designated products and in otherwise utilizing recycled and recovered materials in the execution of the work.

1.3 EPA DESIGNATED ITEMS INCORPORATED IN THE WORK

Various sections of the specifications contain requirements for materials that have been designated by EPA as being products which are or can be made with recovered or recycled materials. These items, when incorporated into the work under this contract, shall contain at least the specified percentage of recycled or recovered materials unless adequate justification (non-availability) for non-use is provided. When a designated item is specified as an option to a non-designated item, the designated item requirements apply only if the designated item is used in the work.

1.4 EPA PROPOSED ITEMS INCORPORATED IN THE WORK

Products other than those designated by EPA are still being researched and are being considered for future Comprehensive Procurement Guideline (CPG) designation. It is recommended that these items, when incorporated in the work under this contract, contain the highest practicable percentage of recycled or recovered materials, provided specified requirements are also met.

1.5 EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

There are many products listed in 40 CFR 247 which have been designated or proposed by EPA to include recycled or recovered materials that may be used by the Contractor in performing the work but will not be incorporated into the work. These products include office products, temporary traffic control products, and pallets. It is recommended that these non-construction products, when used in the conduct of the work, contain the highest practicable percentage of recycled or recovered materials and that these products be recycled when no longer needed.

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SECTION 01781

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SECTION 01781

OPERATION AND MAINTENANCE DATA
12/01

PART 1 GENERAL

1.1 SUBMISSION OF OPERATION AND MAINTENANCE DATA

Submit Operation and Maintenance (O&M) Data specifically applicable to this contract and a complete and concise depiction of the provided equipment, product, or system. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01330 SUBMITTAL PROCEDURES.

1.1.1 Package Quality

Documents must be fully legible. Poor quality copies and material with hole punches obliterating the text or drawings will not be accepted.

1.1.2 Package Content

Data package content shall be as shown in the paragraph titled "Schedule of Operation and Maintenance Data Packages." Comply with the data package requirements specified in the individual technical sections, including the content of the packages and addressing each product, component, and system designated for data package submission.

1.1.3 Changes to Submittals

Manufacturer-originated changes or revisions to submitted data shall be furnished by the Contractor if a component of an item is so affected subsequent to acceptance of the O&M Data. Changes, additions, or revisions required by the Contracting Officer for final acceptance of submitted data, shall be submitted by the Contractor within 30 calendar days of the notification of this change requirement.

1.2 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

1.2.1 Operating Instructions

Include specific instructions, procedures, and illustrations for the following phases of operation:

1.2.1.1 Safety Precautions

List personnel hazards and equipment or product safety precautions for all operating conditions.

1.2.1.2 Operator Prestart

Include procedures required to set up and prepare each system for use.

1.2.1.3 Startup, Shutdown, and Post-Shutdown Procedures

Provide narrative description for Startup, Shutdown and Post-shutdown

operating procedures including the control sequence for each procedure.

1.2.1.4 Normal Operations

Provide narrative description of Normal Operating Procedures. Include Control Diagrams with data to explain operation and control of systems and specific equipment.

1.2.1.5 Emergency Operations

Include Emergency Procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Include Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance and procedures for emergency operation of all utility systems including required valve positions, valve locations and zones or portions of systems controlled.

1.2.1.6 Operator Service Requirements

Include instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gage readings.

1.2.1.7 Environmental Conditions

Include a list of Environmental Conditions (temperature, humidity, and other relevant data) that are best suited for the operation of each product, component or system. Describe conditions under which the item equipment should not be allowed to run.

1.2.2 Preventive Maintenance

Include the following information for preventive and scheduled maintenance to minimize corrective maintenance and repair.

1.2.2.1 Lubrication Data

Include preventative maintenance lubrication data, in addition to instructions for lubrication provided under paragraph titled "Operator Service Requirements":

a. A table showing recommended lubricants for specific temperature ranges and applications.

b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities.

c. A Lubrication Schedule showing service interval frequency.

1.2.2.2 Preventive Maintenance Plan and Schedule

Include manufacturer's schedule for routine preventive maintenance, inspections, tests and adjustments required to ensure proper and economical operation and to minimize corrective maintenance. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

1.2.3 Corrective Maintenance (Repair)

Include manufacturer's recommended procedures and instructions for correcting problems and making repairs.

1.2.3.1 Troubleshooting Guides and Diagnostic Techniques

Include step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

1.2.3.2 Wiring Diagrams and Control Diagrams

Wiring diagrams and control diagrams shall be point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation configuration and numbering.

1.2.3.3 Maintenance and Repair Procedures

Include instructions and alist of tools required to repair or restore the product or equipment to proper condition or operating standards.

1.2.3.4 Removal and Replacement Instructions

Include step-by-step procedures and a list required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Instructions shall include a combination of text and illustrations.

1.2.3.5 Spare Parts and Supply Lists

Include lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonable delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead-time to obtain.

1.2.4 Corrective Maintenance Work-Hours

Include manufacturer's projection of corrective maintenance work-hours including requirements by type of craft. Corrective maintenance that requires completion or participation of the equipment manufacturer shall be identified and tabulated separately.

1.2.5 Appendices

Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:

1.2.6 Parts Identification

Provide identification and coverage for all parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing shall show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped by components, assemblies, and subassemblies in accordance with the manufacturer's standard practice. Parts data may cover more than one model or series of equipment, components, assemblies, subassemblies, attachments, or accessories, such as typically shown in a master parts catalog

1.2.6.1 Warranty Information

List and explain the various warranties and include the servicing and technical precautions prescribed by the manufacturers or contract documents in order to keep warranties in force. Include warranty information for primary components such as the compressor of air conditioning system.

1.2.6.2 Personnel Training Requirements

Provide information available from the manufacturers that is needed for use in training designated personnel to properly operate and maintain the equipment and systems.

1.2.6.3 Testing Equipment and Special Tool Information

Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components.

1.2.6.4 Contractor Information

Provide a list that includes the name, address, and telephone number of the General Contractor and each Subcontractor who installed the product or equipment, or system. For each item, also provide the name address and telephone number of the manufacturer's representative and service organization most convenient to the project site. Provide the name, address, and telephone number of the product, equipment, and system manufacturers.

1.3 SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES

Furnish the O&M data packages specified in individual technical sections. The required information for each O&M data package is as follows:

1.3.1 Data Package 1

a. Safety precautions

b. Maintenance and repair procedures

c. Warranty information

d. Contractor information

e. Spare parts and supply list

1.3.2 Data Package 2

a. Safety precautions

b. Normal operations

c. Environmental conditions

d. Lubrication data

e. Preventive maintenance plan and schedule

f. Maintenance and repair procedures

g. Removal and replacement instructions

h. Spare parts and supply list

i. Parts identification

j. Warranty information

k. Contractor information

1.3.3 Data Package 3

a. Safety precautions

b. Normal operations

c. Emergency operations

d. Environmental conditions

e. Lubrication data

f. Preventive maintenance plan and schedule

g. Troubleshooting guides and diagnostic techniques

h. Wiring diagrams and control diagrams

i. Maintenance and repair procedures

j. Removal and replacement instructions

k. Spare parts and supply list

l. Parts identification

m. Warranty information

n. Testing equipment and special tool information

o. Contractor information

1.3.4 Data Package 4

a. Safety precautions

b. Operator prestart

c. Startup, shutdown, and post-shutdown procedures

d. Normal operations

e. Emergency operations

f. Operator service requirements

g. Environmental conditions

h. Lubrication data

i. Preventive maintenance plan and schedule

j. Troubleshooting guides and diagnostic techniques

k. Wiring diagrams and control diagrams

l. Maintenance and repair procedures

m. Removal and replacement instructions

n. Spare parts and supply list

o. Corrective maintenance man-hours

p. Parts identification

q. Warranty information

r. Personnel training requirements

s. Testing equipment and special tool information

t. Contractor information

1.3.5 Data Package 5

a. Safety precautions

b. Operator prestart

c. Start-up, shutdown, and post-shutdown procedures

d. Normal operations

e. Environmental conditions

f. Preventive maintenance plan and schedule

g. Troubleshooting guides and diagnostic techniques

h. Wiring and control diagrams

i. Maintenance and repair procedures

j. Spare parts and supply list

k. Testing equipments and special tools

l. Warranty information

m. Contractor information

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Not used.

PART 3 EXECUTION

Not used.

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08/03

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SECTION 02300

EARTHWORK
08/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO T 180	(2001) Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and an 457 mm (18-in) Drop
AASHTO T 224	(2001) Correction for Coarse Particles in the Soil Compaction Test

ASTM INTERNATIONAL (ASTM)

ASTM C 136	(2001) Sieve Analysis of Fine and Coarse Aggregates
ASTM D 422	(1963; R 1998) Particle-Size Analysis of Soils
ASTM D 698	(2000a) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))
ASTM C 33	(1999ae1) Concrete Aggregates
ASTM D 1140	(2000) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve
ASTM D 1556	(2000) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(2000) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu. m.))
ASTM D 2487	(2000) Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	(2001) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

ASTM D 3017	(2001) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 4318	(2000) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C600	(1999) Installation of Ductile-Iron Water Mains and Their Appurtenances

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 530/F-93/004	1993; Rev O; Updates I, II, IIA, IIB, and III) Test Methods for Evaluating Solid Waste (Vol IA, IB, IC, and II) (SW-846)
EPA 600/4-79/020	(1983) Methods for Chemical Analysis of Water and Wastes

1.2 DEFINITIONS

1.2.1 Satisfactory Materials

Satisfactory materials shall comprise any materials classified by ASTM D 2487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, GM-GC, SW, SP, SM, SW-SM, SC, SW-SC, SP-SM, SP-SC, CL. Satisfactory materials for grading shall be comprised of stones less than 8 inches, except for fill material for pavements and building foundations which shall be comprised of stones less than 3 inches in any dimension.

1.2.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Unsatisfactory materials also include man-made fills; trash; refuse; backfills from previous construction; and material classified as satisfactory which contains root and other organic matter or frozen material. The Contracting Officer shall be notified of any contaminated materials.

1.2.3 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic. Testing required for classifying materials shall be in accordance with ASTM D 4318, ASTM C 136, ASTM D 422, and ASTM D 1140.

1.2.4 Degree of Compaction

Degree of compaction required, except as noted in the second sentence, is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 abbreviated as a percent of laboratory maximum density. Since ASTM D 1557 applies only to soils that have 30 percent or less by weight of their particles retained on the 3/4 inch sieve, the degree of compaction for material having more than 30 percent by weight of their particles retained on the 3/4 inch sieve shall be expressed as a percentage of the maximum density in accordance with AASHTO T 180

Method D and corrected with AASHTO T 224. To maintain the same percentage of coarse material, the "remove and replace" procedure as described in the NOTE 8 in Paragraph 7.2 of AASHTO T 180 shall be used. On site soils below building foundation, shall be compacted to 100% of standard proctor maximum dry density ASTM D 698 at optimum moister content to 3% above optimum moister content. Select structural fill below building foundation, shall be compacted to 100% of standard proctor maximum dry density ASTM D 698 at optimum moister content to 3% above optimum. Select structural fill below building slab on grade, shall be compacted to 95% of standard proctor maximum dry density ASTM D 698 at optimum moister content to 3% above optimum. On site soils out side of the building foundation, shall be compacted to 95% of standard proctor maximum dry density ASTM D 698 at optimum moister content to 3% above optimum. For the location and extent of the structural fill, see contract documents.

1.2.5 Topsoil

Material suitable for topsoils obtained from offsite areas or excavations is defined as: Natural, friable soil representative of productive, well-drained soils in the area, free of subsoil, stumps, rocks larger than one inch diameter, brush, weeds, toxic substances, and other material detrimental to plant growth. Amend topsoil pH range to obtain a pH of 5.5 to 7.

1.2.6 Unstable Material

Unstable material shall consist of materials too wet to properly support the utility pipe, conduit, or appurtenant structure.

1.2.7 Select Granular Material

1.2.7.1 General Requirements

Select granular material shall consist of materials classified as GW, GP, SW, SP, SP-SC or SP-SM by ASTM D 2487 where indicated. Select fill material shall have a minimum 25% passing the #200 Sieve, a maximum liquid limit of 30 and a maximum plasticity index of 10.

1.2.8 Initial Backfill Material

Initial backfill shall consist of select granular material or satisfactory materials free from rocks 3 inches or larger in any dimension or free from rocks of such size as recommended by the pipe manufacturer, whichever is smaller.

1.2.9 Expansive Soils

Expansive soils are defined as soils that have a plasticity index equal to or greater than 30 when tested in accordance with ASTM D 4318, or have a swell potential greater than 1% at optimum moisture and a 200 psf surcharge.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Utilization of Excavated Materials; G, AO.

Procedure and location for disposal of unused satisfactory material. Proposed source of borrow material.

SD-06 Test Reports

Testing.

Within 24 hours of conclusion of physical tests, 3 copies of test results, including calibration curves and results of calibration tests.

SD-07 Certificates

Testing.

Qualifications of the commercial testing laboratory or Contractor's testing facilities.

1.4 SUBSURFACE DATA

Subsurface soil boring logs are appended to the SPECIAL CONTRACT REQUIREMENTS. These data represent the best subsurface information available; however, variations may exist in the subsurface between boring locations.

1.5 CLASSIFICATION OF EXCAVATION

No consideration will be given to the nature of the materials, and all excavation will be designated as unclassified excavation.

1.6 CRITERIA FOR BIDDING

Base bids on the following criteria:

a. Surface elevations are as indicated.

b. Pipes or other artificial obstructions, except those indicated, will not be encountered.

c. Ground water elevations indicated by the boring log were those existing at the time subsurface investigations were made and do not necessarily represent ground water elevation at the time of construction.

d. Material character is indicated by the boring logs.

PART 2 PRODUCTS

2.1 REQUIREMENTS FOR OFFSITE SOILS

Offsite soils brought in for use as backfill shall be tested for TPH, BTEX and full TCLP including ignitability, corrosivity and reactivity. Backfill shall contain less than 100 parts per million (ppm) of total petroleum hydrocarbons (TPH) and less than 10 ppm of the sum of Benzene, Toluene,

Ethyl Benzene, and Xylene (BTEX) and shall not fail the TCPL test. TPH concentrations shall be determined by using EPA 600/4-79/020 Method 418.1. BTEX concentrations shall be determined by using EPA 530/F-93/004 Method 5030/8020. TCLP shall be performed in accordance with EPA 530/F-93/004 Method 1311. Provide Borrow Site Testing for TPH, BTEX and TCLP from a composite sample of material from the borrow site, with at least one test from each borrow site. Material shall not be brought on site until tests have been approved by the Contracting Officer.

2.2 BURIED WARNING AND IDENTIFICATION TAPE

Polyethylene plastic and metallic core or metallic-faced, acid- and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inch minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Color and printing shall be permanent, unaffected by moisture or soil.

Warning Tape Color Codes

Red:	Electric
Yellow:	Gas, Oil; Dangerous Materials
Orange:	Telephone and Other Communications
Blue:	Water Systems
Green:	Sewer Systems

2.2.1 Warning Tape for Metallic Piping

Acid and alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of tape shall be 0.003 inch. Tape shall have a minimum strength of 1500 psi lengthwise, and 1250 psi crosswise, with a maximum 350 percent elongation.

2.2.2 Detectable Warning Tape for Non-Metallic Piping

Polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of the tape shall be 0.004 inch. Tape shall have a minimum strength of 1500 psi lengthwise and 1250 psi crosswise. Tape shall be manufactured with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to 3 feet deep. Encase metallic element of the tape in a protective jacket or provide with other means of corrosion protection.

2.3 DETECTION WIRE FOR NON-METALLIC PIPING

Detection wire shall be insulated single strand, solid copper with a minimum of 12 AWG.

2.4 MATERIAL FOR RIP-RAP

Provide Bedding material and rock conforming to these requirements for construction indicated.

2.4.1 Bedding Material

Consisting of sand, gravel, or crushed rock, well graded, or poorly graded with a maximum particle size of 2 inches. Material shall be composed of tough, durable particles. Fines passing the No. 200 standard sieve shall have a plasticity index less than six.

2.4.2 Rock

Rock fragments sufficiently durable to ensure permanence in the structure and the environment in which it is to be used. Rock fragments shall be free from cracks, seams, and other defects that would increase the risk of deterioration from natural causes. The size of the fragments shall be such that no individual fragment exceeds a weight of 150 pounds and that no more than 10 percent of the mixture, by weight, consists of fragments weighing 2 pounds or less each. Specific gravity of the rock shall be a minimum of 2.50. The inclusion of more than trace quantities of dirt, sand, clay, and rock fines will not be permitted.

2.5 CAPILLARY WATER BARRIER

Capillary Water Barrier shall consist of clean, poorly graded crushed rock, crushed gravel, or uncrushed gravel placed beneath a building slab with or without a vapor barrier to cut off the capillary flow of pore water to the area immediately below. Fine aggregate grading shall conform to ASTM C 33 with a maximum of 3 percent by weight passing ASTM D 1140, No. 200 sieve, or coarse aggregate Size 57, 67, or 77.

PART 3 EXECUTION

3.1 STRIPPING OF TOPSOIL

Where indicated or directed, topsoil shall be stripped to a depth of 4 inches. Topsoil shall be spread on areas already graded and prepared for topsoil, or transported and deposited in stockpiles convenient to areas that are to receive application of the topsoil later, or at locations indicated or specified. Topsoil shall be kept separate from other excavated materials, brush, litter, objectionable weeds, roots, stones larger than 2 inches in diameter, and other materials that would interfere with planting and maintenance operations. Any surplus of topsoil from excavations and grading shall be removed from the site.

3.2 GENERAL EXCAVATION

The Contractor shall perform excavation of every type of material encountered within the limits of the project to the lines, grades, and elevations indicated and as specified. Grading shall be in conformity with the typical sections shown and the tolerances specified in paragraph FINISHING. Satisfactory excavated materials shall be transported to and placed in fill or embankment within the limits of the work. Unsatisfactory materials encountered within the limits of the work shall be excavated below grade and replaced with satisfactory materials as directed. Such excavated material and the satisfactory material ordered as replacement shall be included in excavation. Surplus satisfactory excavated material not required for fill or embankment shall be disposed of in areas approved for surplus material storage or designated waste areas. Unsatisfactory excavated material shall be disposed of in designated waste or spoil areas. During construction, excavation and fill shall be performed in a manner and sequence that will provide proper drainage at all times. Material

required for fill or embankment in excess of that produced by excavation within the grading limits shall be excavated from the borrow areas indicated or from other approved areas selected by the Contractor as specified.

3.2.1 Ditches, Gutters, and Channel Changes

Excavation of ditches, gutters, and channel changes shall be accomplished by cutting accurately to the cross sections, grades, and elevations shown. Ditches and gutters shall not be excavated below grades shown. Excessive open ditch or gutter excavation shall be backfilled with satisfactory, thoroughly compacted, material or with suitable stone or cobble to grades shown. Material excavated shall be disposed of as shown or as directed, except that in no case shall material be deposited less than 4 feet from the edge of a ditch. The Contractor shall maintain excavations free from detrimental quantities of leaves, brush, sticks, trash, and other debris until final acceptance of the work.

3.2.2 Drainage Structures

Excavations shall be made to the lines, grades, and elevations shown, or as directed. Trenches and foundation pits shall be of sufficient size to permit the placement and removal of forms for the full length and width of structure footings and foundations as shown. Rock or other hard foundation material shall be cleaned of loose debris and cut to a firm, level, stepped, or serrated surface. Loose disintegrated rock and thin strata shall be removed. When concrete or masonry is to be placed in an excavated area, the bottom of the excavation shall not be disturbed. Excavation to the final grade level shall not be made until just before the concrete or masonry is to be placed.

3.2.3 Drainage

Provide for the collection and disposal of surface and subsurface water encountered during construction. Completely drain construction site during periods of construction to keep soil materials sufficiently dry. The Contractor shall establish/construct storm drainage features (ponds/basins) at the earliest stages of site development, and throughout construction grade the construction area to provide positive surface water runoff away from the construction activity and/or provide temporary ditches, swales, and other drainage features and equipment as required to maintain dry soils. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions presented by the plans and specifications and to employ necessary measures to permit construction to proceed.

3.2.4 Dewatering

Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. French drains, sumps, ditches or trenches will not be permitted within 3 feet of the foundation of any structure, except with specific written approval, and after specific contractual provisions for restoration of the foundation area have been made. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in situ material. While the excavation is

open, the water level shall be maintained continuously, at least two feet below the working level.

3.2.5 Trench Excavation Requirements

The trench shall be excavated as recommended by the manufacturer of the pipe to be installed. Trench walls below the top of the pipe shall be sloped, or made vertical, and of such width as recommended in the manufacturer's installation manual. Where no manufacturer's installation manual is available, trench walls shall be made vertical. Trench walls more than 4 feet high shall be shored, cut back to a stable slope, or provided with equivalent means of protection for employees who may be exposed to moving ground or cave in. Trench walls which are cut back shall be excavated to at least the angle of repose of the soil. Special attention shall be given to slopes which may be adversely affected by weather or moisture content. The trench width below the top of pipe shall not exceed 24 inches plus pipe outside diameter (O.D.) for pipes of less than 24 inches inside diameter and shall not exceed 36 inches plus pipe outside diameter for sizes larger than 24 inches inside diameter. Where recommended trench widths are exceeded, redesign, stronger pipe, or special installation procedures shall be utilized by the Contractor. The cost of redesign, stronger pipe, or special installation procedures shall be borne by the Contractor without any additional cost to the Government.

3.2.5.1 Bottom Preparation

The bottoms of trenches shall be accurately graded to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Bell holes shall be excavated to the necessary size at each joint or coupling to eliminate point bearing. Stones of 3 inches or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, shall be removed to avoid point bearing.

3.2.5.2 Removal of Unyielding Material

Where unyielding material is encountered in the bottom of the trench, such material shall be removed 6 inches below the required grade and replaced with suitable materials as provided in paragraph BACKFILLING AND COMPACTION.

3.2.5.3 Removal of Unstable Material

Where unstable material is encountered in the bottom of the trench, such material shall be removed to the depth directed and replaced to the proper grade with select granular material as provided in paragraph BACKFILLING AND COMPACTION. When removal of unstable material is required due to the Contractor's fault or neglect in performing the work, the resulting material shall be excavated and replaced by the Contractor without additional cost to the Government.

3.2.5.4 Excavation for Appurtenances

Excavation for manholes, catch-basins, inlets, or similar structures shall be of sufficient size to permit the placement and removal of forms for the full length and width of structure footings and foundations as shown. Rock shall be cleaned of loose debris and cut to a firm surface either level, stepped, or serrated, as shown or as directed. Loose disintegrated rock and thin strata shall be removed. Removal of unstable material shall be as specified above. When concrete or masonry is to be placed in an excavated area, special care shall be taken not to disturb the bottom of the

excavation. Excavation to the final grade level shall not be made until just before the concrete or masonry is to be placed.

3.2.5.5 Jacking, Boring, and Tunneling

Unless otherwise indicated, excavation shall be by open cut except that sections of a trench may be jacked, bored, or tunneled if, in the opinion of the Contracting Officer, the pipe, cable, or duct can be safely and properly installed and backfill can be properly compacted in such sections.

3.2.6 Underground Utilities

Movement of construction machinery and equipment over pipes and utilities during construction shall be at the Contractor's risk. Perform work adjacent to non-Government utilities as indicated in accordance with procedures outlined by utility company. Excavation made with power-driven equipment is not permitted within two feet of known Government-owned utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work affected by the contract excavation until approval for backfill is granted by the Contracting Officer. Report damage to utility lines or subsurface construction immediately to the Contracting Officer.

3.2.7 Structural Excavation

Ensure that footing subgrades have been inspected and approved by the Contracting Officer prior to concrete placement. Excavate to bottom of pile cap prior to placing or driving piles, unless authorized otherwise by the Contracting Officer.

3.3 SELECTION OF BORROW MATERIAL

Borrow material shall be selected to meet the requirements and conditions of the particular fill or embankment for which it is to be used. Borrow material shall be obtained from the borrow areas from approved private sources. Unless otherwise provided in the contract, the Contractor shall obtain from the owners the right to procure material, pay royalties and other charges involved, and bear the expense of developing the sources, including rights-of-way for hauling. Unless specifically provided, no borrow shall be obtained within the limits of the project site without prior written approval. Necessary clearing, grubbing, and satisfactory drainage of borrow pits and the disposal of debris thereon shall be considered related operations to the borrow excavation.

3.4 SHORING

3.4.1 Geotechnical Engineer

The Contractor is required to hire a Professional Geotechnical Engineer to provide inspection of excavations and soil/groundwater conditions throughout construction. The Geotechnical Engineer shall be responsible for performing pre-construction and periodic site visits throughout construction to assess site conditions. TA written report shall be submitted, at least monthly, informing the Contractor and Contracting Officer of the status of the plan and an accounting of the Contractor's adherence to the plan addressing any present or potential problems. The

Geotechnical Engineer shall be available to meet with the Contracting Officer at any time throughout the contract duration.

3.5 FINAL GRADE OF SURFACES TO SUPPORT CONCRETE

Excavation to final grade shall not be made until just before concrete is to be placed. Only excavation methods that will leave the foundation rock in a solid and unshattered condition shall be used. Approximately level surfaces shall be roughened, and sloped surfaces shall be cut as indicated into rough steps or benches to provide a satisfactory bond. Shales shall be protected from slaking and all surfaces shall be protected from erosion resulting from ponding or flow of water.

3.6 GROUND SURFACE PREPARATION

3.6.1 General Requirements

Unsatisfactory material in surfaces to receive fill or in excavated areas shall be removed and replaced with satisfactory materials as directed by the Contracting Officer. The surface shall be scarified to a depth of 6 inches before the fill is started. Sloped surfaces steeper than 1 vertical to 4 horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When subgrades are less than the specified density, the ground surface shall be broken up to a minimum depth of 6 inches, pulverized, and compacted to the specified density. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches and compacted as specified for the adjacent fill.

3.6.2 Frozen Material

Material shall not be placed on surfaces that are muddy, frozen, or contain frost. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment well suited to the soil being compacted. Material shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used. Minimum subgrade density shall be as specified in paragraph TESTING.

3.7 UTILIZATION OF EXCAVATED MATERIALS

Unsatisfactory materials removed from excavations shall be disposed of in designated waste disposal or spoil areas. Satisfactory material removed from excavations shall be used, insofar as practicable, in the construction of fills, embankments, subgrades, shoulders, bedding (as backfill), and for similar purposes. No satisfactory excavated material shall be wasted without specific written authorization. Satisfactory material authorized to be wasted shall be disposed of in designated areas approved for surplus material storage or designated waste areas as directed. Coarse rock from excavations shall be stockpiled and used for constructing slopes or embankments adjacent to streams, or sides and bottoms of channels and for protecting against erosion. No excavated material shall be disposed of to obstruct the flow of any stream, endanger a partly finished structure, impair the efficiency or appearance of any structure, or be detrimental to the completed work in any way.

3.8 BURIED TAPE AND DETECTION WIRE

3.8.1 Buried Warning and Identification Tape

Provide buried utility lines with utility identification tape. Bury tape 12 inches below finished grade; under pavements and slabs, bury tape 6 inches below top of subgrade.

3.8.2 Buried Detection Wire

Bury detection wire directly above non-metallic piping at a distance not to exceed 12 inches above the top of pipe. The wire shall extend continuously and unbroken, from manhole to manhole. The ends of the wire shall terminate inside the manholes at each end of the pipe, with a minimum of 3 feet of wire, coiled, remaining accessible in each manhole. The wire shall remain insulated over it's entire length. The wire shall enter manholes between the top of the corbel and the frame, and extend up through the chimney seal between the frame and the chimney seal.

3.9 BACKFILLING AND COMPACTION

Backfill adjacent to any and all types of structures shall be placed and compacted to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials to prevent wedging action or eccentric loading upon or against the structure. Ground surface on which backfill is to be placed shall be prepared as specified in paragraph PREPARATION OF GROUND SURFACE FOR EMBANKMENTS. Compaction requirements for backfill materials shall also conform to the applicable portions of paragraphs PREPARATION OF GROUND SURFACE FOR EMBANKMENTS, EMBANKMENTS, and SUBGRADE PREPARATION. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.9.1 Trench Backfill

Trenches shall be backfilled to the grade shown.

3.9.1.1 Replacement of Unstable Material

Unstable material removed from the bottom of the trench or excavation shall be replaced with select granular material placed in layers not exceeding 6 inches loose thickness.

3.9.1.2 Bedding and Initial Backfill

Bedding shall be of the type and thickness shown. Initial backfill material shall be placed and compacted with approved tampers to a height of at least one foot above the utility pipe or conduit. The backfill shall be brought up evenly on both sides of the pipe for the full length of the pipe. Care shall be taken to ensure thorough compaction of the fill under the haunches of the pipe. Except as specified otherwise in the individual piping section, provide bedding for buried piping in accordance with AWWA C600, Type 4, except as specified herein. Backfill to top of pipe shall be compacted to 95 percent of ASTM D 698 maximum density. Plastic piping shall have bedding to spring line of pipe. Provide materials as follows:

a. Clean, coarsely graded natural gravel, crushed stone or a combination thereof having a classification of GW or GP in accordance with ASTM D 2487 for bedding as indicated. Maximum

particle size shall not exceed 2 inches.

3.9.1.3 Final Backfill

The remainder of the trench, except for special materials for roadways, railroads and airfields, shall be filled with satisfactory material. Backfill material shall be placed and compacted as follows:

a. Roadways: Backfill shall be placed up to the required elevation as specified. Water flooding or jetting methods of compaction will not be permitted.

b. Sidewalks, Turfed or Seeded Areas and Miscellaneous Areas: Backfill shall be deposited in layers of a maximum of 12 inch loose thickness, and compacted to 85 percent maximum density for cohesive soils and 90 percent maximum density for cohesionless soils. Compaction by water flooding or jetting will not be permitted. This requirement shall also apply to all other areas not specifically designated above.

3.9.2 Backfill for Appurtenances

After the manhole, catchbasin, inlet, or similar structure has been constructed and the concrete has been allowed to cure for 7 days, backfill shall be placed in such a manner that the structure will not be damaged by the shock of falling earth. The backfill material shall be deposited and compacted as specified for final backfill, and shall be brought up evenly on all sides of the structure to prevent eccentric loading and excessive stress.

3.10 SPECIAL REQUIREMENTS

Special requirements for both excavation and backfill relating to the specific utilities are as follows:

3.10.1 Gas Distribution

Trenches shall be excavated to a depth that will provide not less than 18 inches of cover in rock excavation and not less than 24 inches of cover in other excavation. Trenches shall be graded as specified for pipe-laying requirements in Section 02556 GAS DISTRIBUTION SYSTEM.

3.10.2 Water Lines

Trenches shall be of a depth to provide a minimum cover of 5 feet from the existing ground surface, or from the indicated finished grade, whichever is lower, to the top of the pipe.

3.10.3 Electrical Distribution System

Direct burial cable and conduit or duct line shall have a minimum cover of 24 inches from the finished grade, unless otherwise indicated. Special trenching requirements for direct-burial electrical cables and conduits are specified in Section 16375 ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND.

3.10.4 Rip-Rap Construction

Construct rip-rap on bedding material in the areas indicated. Trim and dress indicated areas to conform to cross sections, lines and grades shown

within a tolerance of 0.1 foot.

3.10.4.1 Bedding Placement

Spread bedding material uniformly to a thickness of at least 3 inches on prepared subgrade as indicated. Compaction of bedding is not required. Finish bedding to present even surface free from mounds and windrows.

3.10.4.2 Stone Placement

Place rock for rip-rap on prepared bedding material to produce a well graded mass with the minimum practicable percentage of voids in conformance with lines and grades indicated. Distribute larger rock fragments, with dimensions extending the full depth of the rip-rap throughout the entire mass and eliminate "pockets" of small rock fragments. Rearrange individual pieces by mechanical equipment or by hand as necessary to obtain the distribution of fragment sizes specified above.

3.11 EMBANKMENTS

3.11.1 Earth Embankments

Earth embankments shall be constructed from satisfactory materials free of organic or frozen material and rocks with any dimension greater than 3 inches. The material shall be placed in successive horizontal layers of loose material not more than 8 inches in depth. Each layer shall be spread uniformly on a soil surface that has been moistened or aerated as necessary, and scarified or otherwise broken up so that the fill will bond with the surface on which it is placed. After spreading, each layer shall be plowed, disked, or otherwise broken up; moistened or aerated as necessary; thoroughly mixed; and compacted to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials. Compaction requirements for the upper portion of earth embankments forming subgrade for pavements shall be identical with those requirements specified in paragraph SUBGRADE PREPARATION. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.12 SUBGRADE PREPARATION

3.12.1 Construction

Subgrade shall be shaped to line, grade, and cross section, and compacted as specified. This operation shall include plowing, disking, and any moistening or aerating required to obtain specified compaction. Soft or otherwise unsatisfactory material shall be removed and replaced with satisfactory excavated material or other approved material as directed. Rock encountered in the cut section shall be excavated to a depth of 6 inches below finished grade for the subgrade. Low areas resulting from removal of unsatisfactory material or excavation of rock shall be brought up to required grade with satisfactory materials, and the entire subgrade shall be shaped to line, grade, and cross section and compacted as specified. The elevation of the finish subgrade shall not vary more than 0.05 foot from the established grade and cross section.

3.12.2 Compaction

Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired

rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. Except for paved areas each layer of the embankment shall be compacted to at least 90 percent of laboratory maximum density.

3.12.2.1 Subgrade for Pavements

Subgrade for pavements shall be compacted to at least 95 percent of laboratory maximum density for the depth below the surface of the pavement shown. When more than one soil classification is present in the subgrade, the top 8 inches of subgrade shall be scarified, windrowed, thoroughly blended, reshaped, and compacted.

3.13 FINISHING

The surface of excavations, embankments, and subgrades shall be finished to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. The degree of finish for graded areas shall be within 0.1 foot of the grades and elevations indicated except that the degree of finish for subgrades shall be specified in paragraph SUBGRADE PREPARATION. Gutters and ditches shall be finished in a manner that will result in effective drainage. The surface of areas to be turfed shall be finished to a smoothness suitable for the application of turfing materials. Settlement or washing that occurs in graded, topsoiled, or backfilled areas prior to acceptance of the work, shall be repaired and grades re-established to the required elevations and slopes.

3.13.1 Subgrade and Embankments

During construction, embankments and excavations shall be kept shaped and drained. Ditches and drains along subgrade shall be maintained to drain effectively at all times. The finished subgrade shall not be disturbed by traffic or other operation and shall be protected and maintained by the Contractor in a satisfactory condition until ballast, subbase, base, or pavement is placed. The storage or stockpiling of materials on the finished subgrade will not be permitted. No subbase, base course, ballast, or pavement shall be laid until the subgrade has been checked and approved, and in no case shall subbase, base, surfacing, pavement, or ballast be placed on a muddy, spongy, or frozen subgrade.

3.13.2 Capillary Water Barrier

Capillary water barrier under concrete floor and area-way slabs on grade shall be placed directly on the subgrade and shall be compacted with a minimum of two passes of a hand-operated plate-type vibratory compactor.

3.13.3 Grading Around Structures

Areas within 5 feet outside of each building and structure line shall be constructed true-to-grade, shaped to drain, and shall be maintained free of trash and debris until final inspection has been completed and the work has been accepted.

3.14 PLACING TOPSOIL

On areas to receive topsoil, the compacted subgrade soil shall be scarified to a 2 inch depth for bonding of topsoil with subsoil. Topsoil then shall be spread evenly to a thickness of 4 inches and graded to the elevations and slopes shown. Topsoil shall not be spread when frozen or excessively wet or dry. Material required for topsoil in excess of that produced by

excavation within the grading limits shall be obtained from offsite areas.

3.15 TESTING

Testing shall be performed by an approved commercial testing laboratory or by the Contractor subject to approval. If the Contractor elects to establish testing facilities, no work requiring testing will be permitted until the Contractor's facilities have been inspected and approved by the Contracting Officer. Field in-place density shall be determined in accordance with ASTM D 2922. When ASTM D 2922 is used, the calibration curves shall be checked and adjusted using only the sand cone method as described in ASTM D 1556. ASTM D 2922 results in a wet unit weight of soil and when using this method ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall also be checked along with density calibration checks as described in ASTM D 3017; the calibration checks of both the density and moisture gauges shall be made at the beginning of a job on each different type of material encountered and at intervals as directed by the Contracting Officer. When test results indicate, as determined by the Contracting Officer, that compaction is not as specified, the material shall be removed, replaced and recompacted to meet specification requirements. Tests on recompacted areas shall be performed to determine conformance with specification requirements. Inspections and test results shall be certified by a registered professional civil engineer. These certifications shall state that the tests and observations were performed by or under the direct supervision of the engineer and that the results are representative of the materials or conditions being certified by the tests. The following number of tests, if performed at the appropriate time, will be the minimum acceptable for each type operation.

3.15.1 Fill and Backfill Material Gradation

One test per 5,000 cubic yards stockpiled or in-place source material. Gradation of fill and backfill material shall be determined in accordance with ASTM C 136.

3.15.2 In-Place Densities

a. One test per 1,500 square feet, or fraction thereof, of each lift of fill or backfill areas compacted by other than hand-operated machines.

b. One test per 250 square feet, or fraction thereof, of each lift of fill or backfill areas compacted by hand-operated machines.

3.15.3 Check Tests on In-Place Densities

If ASTM D 2922 is used, in-place densities shall be checked by ASTM D 1556 as follows:

a. One check test per lift for each ten tests by ASTM D 2922.

3.15.4 Optimum Moisture and Laboratory Maximum Density

Tests shall be made for each type material or source of material including borrow material to determine the optimum moisture and laboratory maximum density values. One representative test per 1,000 cubic yards of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.

3.15.5 Tolerance Tests for Subgrades

Continuous checks on the degree of finish specified in paragraph SUBGRADE PREPARATION shall be made during construction of the subgrades.

3.15.6 Displacement of Sewers

After other required tests have been performed and the trench backfill compacted to the finished grade surface, the pipe shall be inspected to determine whether significant displacement has occurred. This inspection shall be conducted in the presence of the Contracting Officer. Pipe sizes larger than 36 inches shall be entered and examined, while smaller diameter pipe shall be inspected by shining a light or laser between manholes or manhole locations, or by the use of television cameras passed through the pipe. If, in the judgement of the Contracting Officer, the interior of the pipe shows poor alignment or any other defects that would cause improper functioning of the system, the defects shall be remedied as directed at no additional cost to the Government.

3.16 DISPOSITION OF SURPLUS MATERIAL

Surplus material or other soil material not required or suitable for filling or backfilling, and brush, refuse, stumps, roots, and timber shall be removed from Government property as directed by the Contracting Officer.

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SECTION 02510

WATER DISTRIBUTION SYSTEM
05/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 88	(1996) Seamless Copper Water Tube

ASME INTERNATIONAL (ASME)

ASME B16.26	(1988) Cast Copper Alloy Fittings for Flared Copper Tubes

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA B300	(1999) Hypochlorites
AWWA B301	(1999) Liquid Chlorine
AWWA C104	(1995) Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
AWWA C110	(1998) Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (75 mm through 1200 mm), for Water and Other Liquids
AWWA C111	(2000) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C151	(1996) Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids
AWWA C153	(2000) Ductile-Iron Compact Fittings, 3 In. Through 24 In. (76 mm through 610 mm) and 54 In. through 64 In. (1,400 mm through 1,600 mm) for Water Service
AWWA C502	(1994; C502a) Dry-Barrel Fire Hydrants
AWWA C509	(2001) Resilient-Seated Gate Valves for Water Supply Service
AWWA C600	(1999) Installation of Ductile-Iron Water Mains and Their Appurtenances

AWWA C651	(1999) Disinfecting Water Mains
AWWA C800	(2001) Underground Service Line Valves and Fittings
AWWA C900	(1997; C900a) Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In., for Water Distribution
AWWA M23	(1980) Manual: PVC Pipe - Design and Installation

ASBESTOS CEMENT PIPE PRODUCERS ASSOCIATION (ACPPA)

ACPPA 1344	(1988) Recommended Work Practices for A/C Pipe

ASTM INTERNATIONAL (ASTM)

ASTM D 1784	(1999ae1) Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM F 477	(2002e1) Elastomeric Seals (Gaskets) for Joining Plastic Pipe

DUCTILE IRON PIPE RESEARCH ASSOCIATION (DIPRA)

DIPRA TRD	(1997) Thrust Restraint Design for Ductile Iron Pipe

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS SP-80	(1997) Bronze Gate, Globe, Angle and Check Valves

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 24	(1995) Installation of Private Fire Service Mains and Their Appurtenances

NSF INTERNATIONAL (NSF)

NSF 14	(1998) Plastics Piping Components and Related Materials
NSF 61	(1999) Drinking Water System Components - Health Effects (Sections 1-9)

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC Paint 21	(1991) White or Colored Silicone Alkyd Paint
SSPC Paint 25	(1991) Red Iron Oxide, Zinc Oxide, Raw Linseed Oil and Alkyd Primer (Without Lead and Chromate Pigments)

1.2 PIPING

This section covers water distribution and service lines, and connections to building service at a point approximately 5 feet outside buildings and structures to which service is required. The Contractor shall have a copy of the manufacturer's recommendations for each material or procedure to be utilized available at the construction site at all times.

1.2.1 Service Lines

Piping for water service lines less than 3 inches in diameter shall be copper tubing, unless otherwise shown or specified. Piping for water service lines 3 inches and larger shall be ductile iron, or copper tubing unless otherwise shown or specified.

1.2.2 Distribution Lines 80 mm (3 Inches) or Larger

Piping for water distribution lines 3 inches or larger shall be ductile iron or polyvinyl chloride (PVC) unless otherwise shown or specified.

1.2.3 Sprinkler Supply Lines

Piping for water lines supplying sprinkler systems for building fire protection shall conform to NFPA 24 from the point of connection with the water distribution system to the building 5 foot line.

1.2.4 Potable Water Lines

Piping and components of potable water systems which come in contact with the potable water shall conform to NSF 61.

1.2.5 Plastic Piping System

Plastic piping system components (PVC) intended for transportation of potable water shall comply with NSF 14 and be legibly marked with their symbol.

1.2.6 Excavation, Trenching, and Backfilling

Excavation, trenching, and backfilling shall be in accordance with the applicable provisions of Section 02300 EARTHWORK, except as modified herein.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Installation.

The manufacturer's recommendations for each material or procedure to be utilized.

Waste Water Disposal Method; G, AO.

The method proposed for disposal of waste water from hydrostatic tests and disinfection, prior to performing hydrostatic tests.

SD-06 Test Reports

Bacteriological Disinfection; G, AO.

Test results from commercial laboratory verifying disinfection.

1.4 HANDLING

Pipe and accessories shall be handled to ensure delivery to the trench in sound, undamaged condition, including no injury to the pipe coating or lining. If the coating or lining of any pipe or fitting is damaged, the repair shall be made by the Contractor in a satisfactory manner, at no additional cost to the Government. No other pipe or material shall be placed inside a pipe or fitting after the coating has been applied. Pipe shall be carried into position and not dragged. Use of pinch bars and tongs for aligning or turning pipe will be permitted only on the bare ends of the pipe. The interior of pipe and accessories shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved method. Before installation, the pipe shall be inspected for defects. Material found to be defective before or after laying shall be replaced with sound material without additional expense to the Government. Rubber gaskets that are not to be installed immediately shall be stored in a cool and dark place.

PART 2 PRODUCTS

2.1 PIPE

Pipe shall conform to the respective specifications and other requirements specified below.

2.1.1 Plastic Pipe

2.1.1.1 PVC Plastic Pipe

Pipe, couplings and fittings shall be manufactured of material conforming to ASTM D 1784, Class 12454B.

a. Pipe 4 through 12 inch Diameter: Pipe, couplings and fittings shall conform to AWWA C900, Class 150, CIOD pipe dimensions, elastomeric-gasket joint, unless otherwise shown or specified.

2.1.2 Ductile-Iron Pipe

Ductile-iron pipe shall conform to AWWA C151, working pressure not less than 150 psi, unless otherwise shown or specified. Pipe shall be cement-mortar lined in accordance with AWWA C104. Linings shall be standard. When installed underground, pipe shall be coated in accordance with Section 13110 CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE).

2.1.3 Copper Tubing

Copper tubing shall conform to ASTM B 88, Type K, annealed.

2.2 FITTINGS AND SPECIALS

2.2.1 PVC Pipe System

a. For pipe 4 inch diameter and larger, fittings and specials shall be iron, bell end in accordance with AWWA C110, 150 psi pressure rating unless otherwise shown or specified, except that profile of bell may have special dimensions as required by the pipe manufacturer; or fittings and specials may be of the same material as the pipe with elastomeric gaskets, all in conformance with AWWA C900. Iron fittings and specials shall be cement-mortar lined (standard thickness) in accordance with AWWA C104. Fittings shall be bell and spigot or plain end pipe, or as applicable. Ductile iron compact fittings shall be in accordance with AWWA C153.

2.2.2 Ductile-Iron Pipe System

Fittings and specials shall be suitable for 150 psi pressure rating, unless otherwise specified. Fittings and specials for mechanical joint pipe shall conform to AWWA C110. Fittings and specials for use with push-on joint pipe shall conform to AWWA C110 and AWWA C111. Fittings and specials shall be cement-mortar lined (standard thickness) in accordance with AWWA C104. Ductile iron compact fittings shall conform to AWWA C153.

2.2.3 Copper Tubing System

Fittings and specials shall be flared and conform to ASME B16.26.

2.3 JOINTS

2.3.1 Plastic Pipe Jointing

2.3.1.1 PVC Pipe

Joints, fittings, and couplings shall be as specified for PVC pipe. Joints connecting pipe of differing materials shall be made in accordance with the manufacturer's recommendations, and as approved by the Contracting Officer. Elastomeric gaskets shall conform to ASTM F 477.

2.3.2 Ductile-Iron Pipe Jointing

a. Mechanical joints shall be of the stuffing box type and shall conform to AWWA C111.

b. Push-on joints shall conform to AWWA C111.

c. Rubber gaskets and lubricants shall conform to the applicable requirements of AWWA C111.

2.3.3 Isolation Joints

Isolation joints shall be installed between nonthreaded ferrous and nonferrous metallic pipe, fittings and valves. Isolation joints shall consist of a sandwich-type flange isolation gasket of the dielectric type, isolation washers, and isolation sleeves for flange bolts. Isolation gaskets shall be full faced with outside diameter equal to the flange outside diameter. Bolt isolation sleeves shall be full length. Units shall be of a shape to prevent metal-to-metal contact of dissimilar metallic piping elements.

2.3.4 Copper Tubing Jointing

Joints shall be compression-pattern flared and shall be made with the specified fittings.

2.4 VALVES

2.4.1 Gate Valves

Gate valves shall be designed for a working pressure of not less than 150 psi. Valve connections shall be as required for the piping in which they are installed. Valves shall have a clear waterway equal to the full nominal diameter of the valve, and shall be opened by turning counterclockwise. The operating nut or wheel shall have an arrow, cast in the metal, indicating the direction of opening.

a. Valves smaller than 3 inches shall be all bronze and shall conform to MSS SP-80, Type 1, Class 150.

b. Resilient-Seated Gate Valves: For valves 3 to 12 inches in size, resilient-seated gate valves shall conform to AWWA C509.

2.4.2 Indicator Post for Valves

Each valve shown on the drawings with the designation "P.I.V." shall be equipped with indicator post conforming to the requirements of NFPA 24. Operation shall be by a wrench which shall be attached to each post.

2.5 VALVE BOXES

Valve boxes shall be cast iron. Cast-iron boxes shall be extension type with slide-type adjustment and with flared base. The minimum thickness of metal shall be 3/16 inch. The word "WATER" shall be cast in the cover. The box length shall adapt, without full extension, to the depth of cover required over the pipe at the valve location.

2.6 FIRE HYDRANTS

Hydrants shall be Base standard Waterous Low-Profile model, dry-barrel type conforming to AWWA C502 with valve opening at least 5 inches in diameter and designed so that the flange at the main valve seat can be removed with the main valve seat apparatus remaining intact, closed and reasonably tight against leakage and with a breakable valve rod coupling and breakable flange connections located no more than 8 inches above the ground grade. Hydrants shall have a 6 inch bell connection, two 2-1/2 inch hose connections and one 4-1/2 inch pumper connection. Outlets shall have American National Standard fire-hose coupling threads. Working parts shall be bronze. Design, material, and workmanship shall be equal to the latest stock pattern ordinarily produced by the manufacturer. Hydrants shall be painted with 1 coat of red iron oxide, zinc oxide primer conforming to SSPC Paint 25 and 2 finish coats of silicone alkyd paint conforming to SSPC Paint 21, of the installation's standard colors or as directed by the Contracting Officer. Suitable bronze adapter for each outlet, with caps, shall be furnished.

2.7 MISCELLANEOUS ITEMS

2.7.1 Service Clamps

Service clamps shall have a pressure rating not less than that of the pipe to be connected and shall be either the single or double flattened strap type. Clamps shall have a galvanized malleable-iron body with cadmium plated straps and nuts. Clamps shall have a rubber gasket cemented to the body.

2.7.2 Corporation Stops

Corporation stops shall have standard corporation stop thread conforming to AWWA C800 on the inlet end, with flanged joints, compression pattern flared tube couplings, or wiped joints for connections to goosenecks.

2.7.3 Goosenecks

Copper tubing for gooseneck connections shall conform to the applicable requirements of ASTM B 88, Type K, annealed. Length of cable requirement connections shall be in accordance with standard practice.

2.7.4 Service Stops

Service stops shall be water-works inverted-ground-key type, oval or round flow way, tee handle, without drain. Pipe connections shall be suitable for the type of service pipe used. All parts shall be of bronze with female iron-pipe-size connections or compression-pattern flared tube couplings, and shall be designed for a hydrostatic test pressure not less than 200 psi.

2.7.5 Tapping Sleeves

Tapping sleeves of the sizes indicated for connection to existing main shall be the cast gray, ductile, or malleable iron, split-sleeve type with flanged or grooved outlet, and with bolts, follower rings and gaskets on each end of the sleeve. Construction shall be suitable for a maximum working pressure of 150 psi. Bolts shall have square heads and hexagonal nuts. Longitudinal gaskets and mechanical joints with gaskets shall be as recommended by the manufacturer of the sleeve. When using grooved mechanical tee, it shall consist of an upper housing with full locating collar for rigid positioning which engages a machine-cut hole in pipe, encasing an elastomeric gasket which conforms to the pipe outside diameter around the hole and a lower housing with positioning lugs, secured together during assembly by nuts and bolts as specified, pretorqued to 50 foot-pound.

2.7.6 Service Boxes

Service boxes shall be cast iron and shall be extension service boxes of the length required for the depth of the line, with either screw or slide-type adjustment. The boxes shall have housings of sufficient size to completely cover the service stop or valve and shall be complete with identifying covers.

2.7.7 Disinfection

Chlorinating materials shall conform to the following:

Chlorine, Liquid: AWWA B301.

Hypochlorite, Calcium and Sodium: AWWA B300.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Cutting of Pipe

Cutting of pipe shall be done in a neat and workmanlike manner without damage to the pipe. Unless otherwise recommended by the manufacturer and authorized by the Contracting Officer, cutting shall be done with an approved type mechanical cutter. Wheel cutter shall be used when practicable. Copper tubing shall be cut square and all burrs shall be removed. Squeeze type mechanical cutters shall not be used for ductile iron.

3.1.2 Adjacent Facilities

3.1.2.1 Sewer Lines

Where the location of the water pipe is not clearly defined in dimensions on the drawings, the water pipe shall not be laid closer horizontally than 10 feet from a sewer except where the bottom of the water pipe will be at least 12 inches above the top of the sewer pipe, in which case the water pipe shall not be laid closer horizontally than 6 feet from the sewer. Where water lines cross under gravity-flow sewer lines, the sewer pipe, for a distance of at least 10 feet each side of the crossing, shall be fully encased in concrete or shall be made of pressure pipe with no joint located within 3 feet horizontally of the crossing. Water lines shall in all cases cross above sewage force mains or inverted siphons and shall be not less than 2 feet above the sewer main. Joints in the sewer main, closer horizontally than 3 feet to the crossing, shall be encased in concrete.

3.1.2.2 Water Lines

Water lines shall not be laid in the same trench with sewer lines, gas lines, fuel lines, or electric wiring.

3.1.2.3 Copper Tubing Lines

Copper tubing shall not be installed in the same trench with ferrous piping materials.

3.1.2.4 Nonferrous Metallic Pipe

Where nonferrous metallic pipe, e.g. copper tubing, crosses any ferrous piping material, a minimum vertical separation of 12 inches shall be maintained between pipes.

3.1.3 Joint Deflection

3.1.3.1 Offset for Flexible Plastic Pipe

Maximum offset in alignment between adjacent pipe joints shall be as recommended by the manufacturer and approved by the Contracting Officer, but shall not exceed 5 degrees.

3.1.3.2 Allowable for Ductile-Iron Pipe

The maximum allowable deflection shall be as given in AWWA C600. If the alignment requires deflection in excess of the above limitations, special bends or a sufficient number of shorter lengths of pipe shall be furnished to provide angular deflections within the limit set forth.

3.1.4 Placing and Laying

Pipe and accessories shall be carefully lowered into the trench by means of derrick, ropes, belt slings, or other authorized equipment. Water-line materials shall not be dropped or dumped into the trench. Abrasion of the pipe coating shall be avoided. Except where necessary in making connections with other lines or as authorized by the Contracting Officer, pipe shall be laid with the bells facing in the direction of laying. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells, couplings, and joints. Pipe that has the grade or joint disturbed after laying shall be taken up and relaid. Pipe shall not be laid in water or when trench conditions are unsuitable for the work. Water shall be kept out of the trench until joints are complete. When work is not in progress, open ends of pipe, fittings, and valves shall be securely closed so that no trench water, earth, or other substance will enter the pipes or fittings. Where any part of the coating or lining is damaged, the repair shall be made by and at the Contractor's expense in a satisfactory manner. Pipe ends left for future connections shall be valved, plugged, or capped, and anchored, as shown.

3.1.4.1 Plastic Pipe Installation

PVC pipe shall be installed in accordance with AWWA M23.

3.1.4.2 Piping Connections

Where connections are made between new work and existing mains, the connections shall be made by using specials and fittings to suit the actual conditions. When made under pressure, these connections shall be installed using standard methods as approved by the Contracting Officer. Connections to existing asbestos-cement pipe shall be made in accordance with ACPPA 1344.

3.1.5 Jointing

3.1.5.1 PVC Plastic Pipe Requirements

a. Pipe 4 through 12 inch diameter: Joints shall be elastomeric gasket as specified in AWWA C900. Jointing procedure shall be as specified for pipe less than 4 inch diameter with configuration using elastomeric ring gasket.

3.1.5.2 Ductile-Iron Pipe Requirements

Mechanical and push-on type joints shall be installed in accordance with AWWA C600 for buried lines.

3.1.5.3 Copper Tubing Requirements

Joints shall be made with flared fittings. The flared end tube shall be pulled tightly against the tapered part of the fitting by a nut which is part of the fitting, so there is metal-to-metal contact.

3.1.5.4 Isolation Joints and Dielectric Fittings

Isolation joints and dielectric fittings shall be installed in accordance with details specified in paragraph JOINTS. Dielectric unions shall be encapsulated in a field-poured coal-tar covering, with at least 1/8 inch thickness of coal tar over all fitting surfaces.

3.1.5.5 Transition Fittings

Connections between different types of pipe and accessories shall be made with transition fittings approved by the Contracting Officer.

3.1.6 Installation of Service Lines

Service lines shall include the pipeline connecting building piping to water distribution lines to the connections with the building service at a point approximately 5 feet outside the building where such building service exists. Where building services are not installed, the Contractor shall terminate the service lines approximately 5 feet from the site of the proposed building at a point designated by the Contracting Officer. Such service lines shall be closed with plugs or caps. All service stops and valves shall be provided with service boxes. Service lines shall be constructed in accordance with the following requirements:

3.1.6.1 Service Lines

Service lines shall be connected to the main by a tapped saddle, tapping sleeve and valve, service clamp or reducing tee, depending on the main diameter and the service line diameter, and shall have a gate valve.

3.1.6.2 Service Lines for Sprinkler Supplies

Water service lines used to supply building sprinkler systems for fire protection shall be connected to the water distribution main in accordance with NFPA 24.

3.1.7 Setting of Fire Hydrants,Valves and Valve Boxes

3.1.7.1 Location of Fire Hydrants

Fire hydrants shall be located and installed as shown. Each hydrant shall be connected to the main with a 6 inch branch line having at least as much cover as the distribution main. Hydrants shall be set plumb with pumper nozzle facing the roadway, with the center of the lowest outlet not less than 18 inches above the finished surrounding grade, and the operating nut not more than 48 inches above the finished surrounding grade. Fire hydrants designated on the drawings as low profile shall have the lowest outlet not less than 18 inches above the finished surrounding grade, the top of the hydrant not more than 24 inches above the finished surrounding grade. Except where approved otherwise, the backfill around hydrants shall be thoroughly compacted to the finished grade immediately after installation to obtain beneficial use of the hydrant as soon as practicable. The hydrant shall be set upon a slab of concrete not less than 4 inches thick and 15 inches square. Not less than 7 cubic feet of free-draining broken stone or gravel shall be placed around and beneath the waste opening of dry barrel hydrants to ensure drainage.

3.1.7.2 Location of Valves

After delivery, valves, including those in hydrants, shall be drained to prevent freezing and shall have the interiors cleaned of all foreign matter before installation. Stuffing boxes shall be tightened and hydrants and valves shall be fully opened and fully closed to ensure that all parts are in working condition. Check, pressure reducing, vacuum, and air relief valves shall be installed in valve pits. Valves and valve boxes shall be installed where shown or specified, and shall be set plumb. Valve boxes shall be centered on the valves. Boxes shall be installed over each outside gate valve unless otherwise shown. Where feasible, valves shall be located outside the area of roads and streets. Earth fill shall be tamped around each valve box or pit to a distance of 4 feet on all sides of the box, or the undisturbed trench face if less than 4 feet.

3.1.7.3 Location of Service Boxes

Where water lines are located below paved streets having curbs, the boxes shall be installed directly back of the curbs. Where no curbing exists, service boxes shall be installed in accessible locations, beyond the limits of street surfacing, walks and driveways.

3.1.8 Thrust Restraint

Plugs, caps, tees and bends deflecting 11.25 degrees or more, either vertically or horizontally, on waterlines 4 inches in diameter or larger, and fire hydrants shall be provided with thrust restraints. Valves shall be securely anchored or shall be provided with thrust restraints to prevent movement. Thrust restraints shall be either thrust blocks or, for ductile-iron pipes, restrained joints. Thrust restraints shall be manufactured by the pipe manufacturer.

3.1.8.1 Thrust Blocks

Thrust blocking shall be concrete of a mix not leaner than: 1 cement, 2-1/2 sand, 5 gravel; and having a compressive strength of not less than 2,000 psi after 28 days. Blocking shall be placed between solid ground and the hydrant or fitting to be anchored. Unless otherwise indicated or directed, the base and thrust bearing sides of thrust blocks shall be poured directly against undisturbed earth. The sides of thrust blocks not subject to thrust may be poured against forms. The area of bearing shall be as shown or as directed. Blocking shall be placed so that the fitting joints will be accessible for repair. Steel rods and clamps, protected by galvanizing or by coating with bituminous paint, shall be used to anchor vertical down bends into gravity thrust blocks.

3.1.8.2 Restrained Joints

For ductile-iron pipe, restrained joints shall be designed by the Contractor or the pipe manufacturer in accordance with DIPRA TRD.

3.2 HYDROSTATIC TESTS

Where any section of a water line is provided with concrete thrust blocking for fittings or hydrants, the hydrostatic tests shall not be made until at least 5 days after installation of the concrete thrust blocking, unless otherwise approved.

3.2.1 Pressure Test

After the pipe is laid, the joints completed, fire hydrants permanently installed, and the trench backfilled the newly laid piping or any valved section of piping shall, unless otherwise specified, be subjected for 1 hour to a hydrostatic pressure test of 200 psi. Each valve shall be opened and closed several times during the test. Joints showing visible leakage shall be replaced or remade as necessary. Cracked or defective pipe, joints, fittings, hydrants and valves discovered in consequence of this pressure test shall be removed and replaced with sound material, and the test shall be repeated until the test results are satisfactory.

3.2.2 Leakage Test

Leakage test shall be conducted after the pressure tests have been satisfactorily completed. The duration of each leakage test shall be at least 2 hours, and during the test the water line shall be subjected to not less than 200 psi pressure. Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved or approved section, necessary to maintain pressure within 5 psi of the specified leakage test pressure after the pipe has been filled with water and the air expelled. Piping installation will not be accepted if leakage exceeds the allowable leakage which is determined by the following formula:

L = 0.0001351ND(P raised to 0.5 power)

L = Allowable leakage in gallons per hour
N = Number of joints in the length of pipeline tested
D = Nominal diameter of the pipe in inches
P = Average test pressure during the leakage test, in psi gauge

Should any test of pipe disclose leakage greater than that calculated by the above formula, the defective joints shall be located and repaired until the leakage is within the specified allowance, without additional cost to the Government.

3.2.3 Time for Making Test

Except for joint material setting or where concrete thrust blocks necessitate a 5-day delay, pipelines jointed with rubber gaskets, mechanical or push-on joints, or couplings may be subjected to hydrostatic pressure, inspected, and tested for leakage at any time after partial completion of backfill. Cement-mortar lined pipe may be filled with water as recommended by the manufacturer before being subjected to the pressure test and subsequent leakage test.

3.2.4 Concurrent Hydrostatic Tests

The Contractor may elect to conduct the hydrostatic tests using either or both of the following procedures. Regardless of the sequence of tests employed, the results of pressure tests, leakage tests, and disinfection shall be as specified. Replacement, repair or retesting required shall be accomplished by the Contractor at no additional cost to the Government.

a. Pressure test and leakage test may be conducted concurrently.

b. Hydrostatic tests and disinfection may be conducted concurrently, using the water treated for disinfection to accomplish the

hydrostatic tests. If water is lost when treated for disinfection and air is admitted to the unit being tested, or if any repair procedure results in contamination of the unit, disinfection shall be reaccomplished.

3.3 BACTERIAL DISINFECTION

3.3.1 Bacteriological Disinfection

Before acceptance of potable water operation, each unit of completed waterline shall be disinfected as prescribed by AWWA C651. Personnel from the Contractor's commercial laboratory shall take at least 3 water samples from different points, approved by the Contracting Officer, in proper sterilized containers and perform a bacterial examination in accordance with state approved methods. The commercial laboratory shall be certified by the state's approving authority for examination of potable water. The disinfection shall be repeated until tests indicate the absence of pollution for at least 2 full days. The unit will not be accepted until satisfactory bacteriological results have been obtained.

3.4 CLEANUP

Upon completion of the installation of water lines, and appurtenances, all debris and surplus materials resulting from the work shall be removed.

-- End of Section --

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SECTION 02531

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07/03

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SECTION 02531

SANITARY SEWERS
07/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C 150	(2002a) Portland Cement
ASTM C 270	(2002) Mortar for Unit Masonry
ASTM C 443	(2002) Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C 478	(2002a) Precast Reinforced Concrete Manhole Sections
ASTM C 923	(2002) Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals
ASTM C 94	(2000e2) Ready-Mixed Concrete
ASTM C 990	(2001a) Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealers
ASTM D 2321	(2000) Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D 3034	(2000) Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D 3212	(1996a) Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM D 4101	(1995) Polypropylene Injection and Extrusion Materials
ASTM F 477	(2002e1) Elastomeric Seals (Gaskets) for Joining Plastic Pipe

AMERICAN WATER WORKS ASSOCIATION(AWWA)

AWWA C104	(1995) Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
AWWA C105	(1999) Polyethylene Encasement for Ductile-Iron Pipe Systems
AWWA C110	(1998) Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (76 mm through 1219 mm), for Water
AWWA C111	(2000) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C151	(2002) Ductile-Iron Pipe, Centrifugally Cast, for Water
AWWA C153	(2000) Ductile-Iron Compact Fittings for Water Service
AWWA C600	(1999) Installation of Ductile-Iron Water Mains and Their Appurtenances

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.27	Fixed Ladders

1.2 SYSTEM DESCRIPTION

1.2.1 Sanitary Sewer Gravity Pipeline

Provide new and modify existing exterior sanitary gravity sewer piping and appurtenances. Provide each system complete and ready for operation. The exterior sanitary gravity sewer system includes equipment, materials, installation, and workmanship as specified herein more than 5 feet outside of building walls.

1.3 GENERAL REQUIREMENTS

The construction required herein shall include appurtenant structures and building sewers to points of connection with the building drains 5 feet outside the building to which the sewer system is to be connected. The Contractor shall replace damaged material and redo unacceptable work at no additional cost to the Government. Excavation and backfilling is specified in Section 02300 EARTHWORK. Backfilling shall be accomplished after inspection by the Contracting Officer. Before, during, and after installation, plastic pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions unless directed otherwise by the Contracting Officer. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install the plastic pipe shall be stored in accordance with the manufacturer's recommendation and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Pipeline materials.

Submit manufacturer's standard drawings or catalog cuts.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery and Storage

1.5.1.1 Piping

Inspect materials delivered to site for damage; store with minimum of handling. Store materials on site in enclosures or under protective coverings. Store plastic piping and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

1.5.1.2 Metal Items

Check upon arrival; identify and segregate as to types, functions, and sizes. Store off the ground in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.

1.5.2 Handling

Handle pipe, fittings, and other accessories in such manner as to ensure delivery to the trench in sound undamaged condition. Carry, do not drag, pipe to trench.

PART 2 PRODUCTS

2.1 PIPELINE MATERIALS

Pipe shall conform to the respective specifications and other requirements specified below.

2.1.1 Ductile Iron Gravity Sewer Pipe and Associated Fittings

2.1.1.1 Ductile Iron Gravity Pipe and Fittings

Ductile iron pipe shall conform to AWWA C151. Fittings shall conform to AWWA C110 or AWWA C153. Fittings with push-on joint ends shall conform to the same requirements as fittings with mechanical-joint ends. Fittings shall have strength at least equivalent to that of the pipe. Ends of pipe and fittings shall be suitable for the joints specified hereinafter. Pipe and fittings shall have cement-mortar lining conforming to AWWA C104, standard thickness.

2.1.1.2 Ductile Iron Gravity Joints and Jointing Materials

Pipe and fittings shall have push-on joints, except as otherwise specified in this paragraph. Push-on joint pipe ends and fitting ends, gaskets, and lubricant for joint assembly shall conform to AWWA C111.

2.1.2 PVC Plastic Gravity Sewer Piping

2.1.2.1 PVC Plastic Gravity Pipe and Fittings

ASTM D 3034, SDR 35, with ends suitable for elastomeric gasket joints.

2.1.2.2 PVC Plastic Gravity Joints and Jointing Material

Joints shall conform to ASTM D 3212. Gaskets shall conform to ASTM F 477.

2.2 CONCRETE MATERIALS

2.2.1 Cement Mortar

Cement mortar shall conform to ASTM C 270, Type M with Type II cement.

2.2.2 Portland Cement

Portland cement shall conform to ASTM C 150, Type II for concrete used in concrete pipe, concrete pipe fittings, and manholes and type optional with the Contractor for cement used in concrete cradle, concrete encasement, and thrust blocking.

2.2.3 Portland Cement Concrete

Portland cement concrete shall conform to ASTM C 94, compressive strength of 4000 psi at 28 days, except for concrete cradle and encasement or concrete blocks for manholes. Concrete used for cradle and encasement shall have a compressive strength of 2500 psi minimum at 28 days. Concrete in place shall be protected from freezing and moisture loss for 7 days.

2.3 MISCELLANEOUS MATERIALS

2.3.1 Precast Concrete Manholes

Precast concrete manhole risers, base sections, and tops shall conform to ASTM C 478; base and first riser shall be monolithic.

2.3.2 Gaskets and Connectors

Gaskets for joints between manhole sections shall conform to ASTM C 443. Resilient connectors for making joints between manhole and pipes entering manhole shall conform to ASTM C 923 or ASTM C 990.

2.3.3 External Preformed Rubber Joint Seals

An external preformed rubber joint seal shall be an accepted method of sealing cast iron covers to precast concrete sections to prevent ground water infiltration into sewer systems. The seal shall be multi-section with a neoprene rubber top section and all lower sections made of Ethylene Proplene Di Monomer (EPDM) rubber with a minimum thickness of 60 mils. Each unit shall consist of a top and bottom section and shall have mastic

on the bottom of the bottom section and mastic on the top and bottom of the top section. The mastic shall be a non-hardening butyl rubber sealant and shall seal to the cone/top slab of the manhole/catch basin and over the lip of the casting. Extension sections shall cover up to two more adjusting rings.

2.3.4 Metal Items

2.3.4.1 Frames, Covers, and Gratings for Manholes

Frames and covers shall be cast iron or ductile iron. Cast iron frames and covers shall be as indicated or shall be of type suitable for the application, circular, without vent holes. The frames and covers shall have a combined weight of not less than 400 pounds. The word "Sewer" shall be stamped or cast into covers so that it is plainly visible.

2.3.4.2 Manhole Steps

Zinc-coated steel conforming to 29 CFR 1910.27. As an option, plastic or rubber coating pressure-molded to the steel may be used. Plastic coating shall conform to ASTM D 4101, copolymer polypropylene. Rubber shall conform to ASTM C 443, except shore A durometer hardness shall be 70 plus or minus 5. Aluminum steps or rungs will not be permitted. Steps are not required in manholes less than 4 feet deep.

2.3.4.3 Manhole Ladders

A steel ladder shall be provided where the depth of a manhole exceeds 12 feet. The ladder shall not be less than 16 inches in width, with 3/4 inch diameter rungs spaced 12 inches apart. The two stringers shall be a minimum 3/8 inch thick and 2 inches wide. Ladders and inserts shall be galvanized after fabrication.

PART 3 EXECUTION

3.1 INSTALLATION OF PIPELINES AND APPURTENANT CONSTRUCTION

3.1.1 General Requirements for Installation of Pipelines

Apply except where specific exception is made in the following paragraphs entitled "Special Requirements."

3.1.1.1 Location

The work covered by this section shall terminate at a point approximately 5 feet from the building, unless otherwise indicated. Where the location of the sewer is not clearly defined by dimensions on the drawings, do not lay sewer line closer horizontally than 10 feet to a water main or service line. Where sanitary sewer lines pass above water lines, encase sewer in concrete for a distance of 10 feet on each side of the crossing, or substitute rubber-gasketed pressure pipe for the pipe being used for the same distance. Where sanitary sewer lines pass below water lines, lay pipe so that no joint in the sewer line will be closer than 3 feet, horizontal distance, to the water line.

a. Sanitary piping installation parallel with water line:

(1) Normal conditions: Sanitary piping or manholes shall be laid at least 10 feet horizontally from a water line whenever possible.

The distance shall be measured edge-to-edge.

(2) Unusual conditions: When local conditions prevent a horizontal separation of 10 feet, the sanitary piping or manhole may be laid closer to a water line provided that:

(a) The top (crown) of the sanitary piping shall be at least 18 inches below the bottom (invert) of the water main.

(b) Where this vertical separation cannot be obtained, the sanitary piping shall be constructed of AWWA-approved ductile iron water pipe pressure tested in place without leakage prior to backfilling.

(c) The sewer manhole shall be of watertight construction and tested in place.

b. Installation of sanitary piping crossing a water line:

(1) Normal conditions: Lay sanitary piping crossing water lines to provide a separation of at least 18 inches between the top of the sanitary piping and the bottom of the water line whenever possible.

(2) Unusual conditions: When local conditions prevent a vertical separation described above, use the following construction:

(a) Sanitary piping passing over or under water lines shall be constructed of AWWA-approved ductile iron water pipe, pressure tested in place without leakage prior to backfilling.

(b) Sanitary piping passing over water lines shall, in addition, be protected by providing:

1. A vertical separation of at least 18 inches between the bottom of the sanitary piping and the top of the water line.

2. Adequate structural support for the sanitary piping to prevent excessive deflection of the joints and the settling on and breaking of the water line.

3. That the length, minimum 20 feet, of the sanitary piping be centered at the point of the crossing so that joints shall be equidistant and as far as possible from the water line.

c. Sanitary sewer manholes: No water piping shall pass through or come in contact with any part of a sanitary sewer manhole.

3.1.1.2 Earthwork

Perform earthwork operations in accordance with Section 02300 EARTHWORK.

3.1.1.3 Pipe Laying and Jointing

Inspect each pipe and fitting before and after installation; replace those found defective and remove from site. Provide proper facilities for lowering sections of pipe into trenches. Lay nonpressure pipe with the bell ends in the upgrade direction. Adjust spigots in bells to give a uniform space all around. Blocking or wedging between bells and spigots

will not be permitted. Replace by one of the proper dimensions, pipe or fittings that do not allow sufficient space for installation of joint material. At the end of each work day, close open ends of pipe temporarily with wood blocks or bulkheads. Provide batterboards not more than 25 feet apart in trenches for checking and ensuring that pipe invert elevations are as indicated. Laser beam method may be used in lieu of batterboards for the same purpose.

Branch connections shall be made by use of regular fittings or solvent cemented saddles as approved. Saddles for PVC pipe shall conform to Table 4 of ASTM D 3034.

3.1.1.4 Connections to Existing Lines

Obtain approval from the Contracting Officer before making connection to existing line. Conduct work so that there is minimum interruption of service on existing line.

3.1.2 Special Requirements

3.1.2.1 Installation of Ductile Iron Gravity Sewer Pipe

Unless otherwise specified, install pipe and associated fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the requirements of AWWA C600 for pipe installation and joint assembly.

a. Make push-on joints with the gaskets and lubricant specified for this type joint and assemble in accordance with the applicable requirements of AWWA C600 for joint assembly.

b. Exterior protection: Completely encase buried ductile iron pipelines with polyethylene tube or sheet in accordance with AWWA C105, using Class A polyethylene film.

3.1.2.2 Installation of PVC Plastic Piping

Install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the requirements of ASTM D 2321 for laying and joining pipe and fittings. Make joints with the gaskets specified for joints with this piping and assemble in accordance with the requirements of ASTM D 2321 for assembly of joints. Make joints to other pipe materials in accordance with the recommendations of the plastic pipe manufacturer.

3.1.3 Manhole Construction

Construct base slab of cast-in-place concrete or use precast concrete base sections. Make inverts in cast-in-place concrete and precast concrete bases with a smooth-surfaced semi-circular bottom conforming to the inside contour of the adjacent sewer sections. For changes in direction of the sewer and entering branches into the manhole, make a circular curve in the manhole invert of as large a radius as manhole size will permit. For cast-in-place concrete construction, either pour bottom slabs and walls integrally or key and bond walls to bottom slab. No parging will be permitted on interior manhole walls. For precast concrete construction, make joints between manhole sections with the gaskets specified for this

purpose; install in the manner specified for installing joints in concrete piping. Parging will not be required for precast concrete manholes. Cast-in-place concrete work shall be in accordance with the requirements specified under paragraph entitled "Concrete Work" of this section. Make joints between concrete manholes and pipes entering manholes with the resilient connectors specified for this purpose; install in accordance with the recommendations of the connector manufacturer. Where a new manhole is constructed on an existing line, remove existing pipe as necessary to construct the manhole. Cut existing pipe so that pipe ends are approximately flush with the interior face of manhole wall, but not protruding into the manhole. Use resilient connectors as previously specified for pipe connectors to concrete manholes.

3.1.4 Miscellaneous Construction and Installation

3.1.4.1 Connecting to Existing Manholes

Pipe connections to existing manholes shall be made so that finish work will conform as nearly as practicable to the applicable requirements specified for new manholes, including all necessary concrete work, cutting, and shaping. The connection shall be centered on the manhole. Holes for the new pipe shall be of sufficient diameter to allow packing cement mortar around the entire periphery of the pipe but no larger than 1.5 times the diameter of the pipe. Cutting the manhole shall be done in a manner that will cause the least damage to the walls.

3.1.4.2 Metal Work

a. Workmanship and finish: Perform metal work so that workmanship and finish will be equal to the best practice in modern structural shops and foundries. Form iron to shape and size with sharp lines and angles. Do shearing and punching so that clean true lines and surfaces are produced. Make castings sound and free from warp, cold shuts, and blow holes that may impair their strength or appearance. Give exposed surfaces a smooth finish with sharp well-defined lines and arises. Provide necessary rabbets, lugs, and brackets wherever necessary for fitting and support.

b. Field painting: After installation, clean cast-iron frames, covers, gratings, and steps not buried in concrete to bare metal of mortar, rust, grease, dirt, and other deleterious materials and apply a coat of bituminous paint. Do not paint surfaces subject to abrasion.

3.1.5 Installations of Wye Branches

Cutting into piping for connections shall not be done except in special approved cases. When the connecting pipe cannot be adequately supported on undisturbed earth or tamped backfill, the pipe shall be encased in concrete backfill or supported on a concrete cradle as directed. Concrete required because of conditions resulting from faulty construction methods or negligence by the Contractor shall be installed at no additional cost to the Government. The installation of wye branches in an existing sewer shall be made by a method which does not damage the integrity of the existing sewer. One acceptable method consists of removing one pipe section, breaking off the upper half of the bell of the next lower section and half of the running bell of wye section. After placing the new section, it shall be rotated so that the broken half of the bell will be at the bottom. The two joints shall then be made with joint packing and

cement mortar.

3.2 FIELD QUALITY CONTROL

3.2.1 Field Tests and Inspections

The Contracting Officer will conduct field inspections and witness field tests specified in this section. The Contractor shall perform field tests and provide labor, equipment, and incidentals required for testing. Be able to produce evidence, when required, that each item of work has been constructed in accordance with the drawings and specifications.

3.2.2 Tests for Nonpressure Lines

Check each straight run of pipeline for gross deficiencies by holding a light in a manhole; it shall show a practically full circle of light through the pipeline when viewed from the adjoining end of line. When pressure piping is used in a nonpressure line for nonpressure use, test this piping as specified for nonpressure pipe.

-- End of Section --

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12/01

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SECTION 02555

PREFABRICATED UNDERGROUND HEATING/COOLING DISTRIBUTION SYSTEM
12/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASME INTERNATIONAL (ASME)

ASME B1.20.1	(1983; R 2001) Pipe Threads, General Purpose, Inch
ASME B16.11	(2002) Forged Fittings, Socket-Welding and Threaded
ASME B16.9	(2001) Factory-Made Wrought Steel Buttwelding Fittings
ASME B31.1	(2001) Power Piping
ASME BPVC SEC IX	(2001) Boiler and Pressure Vessel Code; Section IX, Welding and Brazing Qualifications

ASTM INTERNATIONAL (ASTM)

ASTM A 105	(2002) Carbon Steel Forgings for Piping Applications
ASTM A 106	(2002a) Seamless Carbon Steel Pipe for High-Temperature Service
ASTM A 234	(2002) Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
ASTM A 53	(2002) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM C 518	(2002e1) Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
ASTM C 591	(2001) Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation
ASTM D 1384	(2001) Corrosion Test for Engine Coolants in Glassware
ASTM D 3350	(2002a) Polyethylene Plastics Pipe and

Fittings Materials

COPPER DEVELOPMENT ASSOCIATION (CDA)

CDA A4015 (1994; R 1995) Copper Tube Handbook

1.2 SYSTEM DESCRIPTION

The system consists of a buried prefabricated chilled water distribution system including service connections to a point 6 inches inside of the building. The contract drawings show the specific arrangement of piping, sizes and grades of pipe, and other details. The system is designed for an operating pressure of 100 psig and an operating temperature of 40 degrees F for chilled water.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Distribution System; G-AE.

Detail drawings consisting of fabrication and assembly drawings, for all parts of the work in sufficient detail to check conformity with the requirements of the contract documents, prior to installation. Detail drawings shall also contain complete piping, wiring and schematic diagrams and any other details to demonstrate that the system has been coordinated and will properly function as a unit. Drawings shall show proposed layout, method of compensation for pipe expansion and contraction, anchorage of equipment and appurtenances, and equipment relationship to other parts of the work including clearances required for maintenance and operation. The drawings shall clearly identify any proposed deviations from the requirements of the contract documents.

SD-03 Product Data

Distribution System; G-AE.

Data composed of catalog cuts, brochures, circulars, specifications and product data, and printed information in sufficient detail and scope to verify compliance with the requirements of the contract documents.

SD-07 Certificates

Distribution System; G-AO.

The manufacturer's or system fabricator's written certification stating that the distribution system furnished meets all the requirements of this specification.

Welding; G-AO.

Prior to welding operations, a copy of qualified procedures and a list of names and identification symbols of qualified welders and welding operators.

SD-10 Operation and Maintenance Data

Distribution System; G-AO.

Six copies of operation and 6 copies of maintenance manuals for the equipment furnished, 1 complete set prior to performance testing and the remainder upon acceptance. Operation manuals shall detail the step-by-step procedures required for equipment startup, operation, and shutdown. Operation manuals shall include the manufacturer's name, model number, parts list, and brief description of all equipment and their basic operating features. Maintenance manuals shall list routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guides. Maintenance manuals shall include piping and equipment layout and simplified wiring and control diagrams of the equipment system as installed. Manuals shall be approved prior to the field performance testing.

1.4 DELIVERY AND STORAGE

After delivery to the jobsite, all materials and equipment shall be protected from anything which could cause damage to the material or equipment. Pipe shall be sealed at each end to keep the interior clean and free of dirt and debris. Fittings shall be kept together and their interior surfaces shall remain clean. Insulation shall be kept dry and clean.

1.5 FIELD MEASUREMENTS

The Contractor shall become familiar with all details of the work, verify all dimensions in the field and shall advise the Contracting Officer of any discrepancy before performing the work.

1.6 WELDING

Piping shall be welded in accordance with qualified procedures using performance qualified welders and welding operators. Procedures and welders shall be qualified in accordance with ASME BPVC SEC IX. Welding procedures qualified by others, and welders and welding operators qualified by another employer may be accepted as permitted by ASME B31.1. The Contracting Officer shall be notified 24 hours in advance of tests and the tests shall be performed at the work site if practicable. The welder or welding operator shall apply his assigned symbol near each weld he makes as a permanent record. Structural members shall be welded in accordance with Section 05090 WELDING, STRUCTURAL.

PART 2 PRODUCTS

2.1 STANDARD PRODUCTS

System components shall be standard products of a manufacturer regularly engaged in the manufacture of the product and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. The system shall be supported by a service organization that is,

in the opinion of the Contracting Officer, reasonably convenient to the site.

2.2 PIPING AND CASING MATERIALS

2.2.1 General

Metallic pressure pipe, fittings, and piping accessories shall conform to the requirements of ASME B31.1 and shall be types suitable for the temperature and pressure of the water.

2.2.2 Piping

2.2.2.1 Steel Pipe

Piping shall conform to ASTM A 53, Grade B, standard weight, black or to ASTM A 106, Grade B, standard weight.

2.2.3 Casings

2.2.3.1 Polyethylene (PE) Casing

Polyethylene casings shall conform to ASTM D 3350, Type III, Class C, Category 3 or 4, Grade P 34 with thickness as follows:

Casing Diameter (in inches)	Minimum Thickness (in mils)
10 and smaller	125
10 to 18	150
18 through 24	200
over 24	225

2.3 PIPING CONNECTIONS

2.3.1 Steel Pipe

Steel pipe smaller than 3/4 inch may be threaded; otherwise, all steel pipe shall be welded. Steel welding fittings shall conform to the requirements of ASTM A 105 or ASTM A 234. Welding fittings shall also conform to ASME B16.9 for buttweld fittings and ASME B16.11 for socket-weld fittings. Long radius buttwelding elbows conforming to ASME B16.9 shall be used whenever space permits. Pipe Threads shall conform to ASME B1.20.1. Pipe to be threaded shall be schedule 80.

2.3.2 Plastic Pipe

a. Pipe, fittings, flanges, and couplings shall have end connections of the adhesive bell and spigot type. Threaded piping, including pipe, fittings, flanges, and couplings, will not be permitted.

b. Flanged Connections: Flat face flanged connections shall be provided between plastic piping and metal piping. Plastic flanges shall be suitable for connection to ASME Class 150 flanges.

2.3.2.1 General

Plastic fittings shall be made of the same type and grade of material as the piping to which they will be connected and shall be furnished by the

manufacturer who supplies the pipe. Fittings shall have temperature and pressure ratings not less than those of the connecting piping.

2.4 END SEALS

2.4.1 General

Each preinsulated section of piping shall have a complete sealing of the insulation to provide a permanent water and vapor seal at each end of the preinsulated section of piping. Preinsulated sections of piping modified in the field shall be provided with an end seal which is equivalent to the end seals furnished with the preinsulated section of piping. End seals must be tested and certified in accordance with paragraph Casing and End Seal Testing and Certification.

2.4.2 Types

End seals provided shall be one of the following types:

a. Carrying the outer casing over tapered pipe insulation ends and extending it to the carrier pipe. Sufficient surface bonding area shall be provided between the casing and the carrier pipe.

b. Using specially designed molded caps made of polyethylene or rubber of standard manufactured thickness. A minimum 1-1/2 inch surface bonding area shall be provided between the cap and both the casing and carrier pipe.

c. Using elastomer-ring end seals designed and dimensioned to fit in the annular space between the casing and the carrier pipe.

d. Using a waterproof mastic seal vapor barrier over the exposed insulation ends.

e. Shrink sleeves.

2.4.3 Casing and End Seal Testing and Certification

Testing and certification procedures by an independent testing laboratory shall demonstrate that casings and end seals are capable of resisting penetration of water into the casing and insulation. The test shall be performed on the type of prefabricated system to be furnished. If more than one type of prefabricated system is to be used, then the tests shall be performed on each type. The test shall consist of hot and cold cycle testing followed by immersion in a water filled chamber with a head pressure. The hot and cold cycle testing shall consist of 14 days of temperature cycling. A fluid with a temperature of 40 degrees F shall circulate through the carrier pipe alternating every 24-hours with a fluid with a temperature of 200 degrees F circulating through the carrier pipe for a low temperature hot water or dual temperature service or 75 degrees F for a chilled water service. While the hot and cold cycle test is being performed, the test sample is either buried or encased in dry bedding sand with a minimum of 12 inches of sand all around the test sample. The carrier pipe size of the test sample shall be 3 inches in diameter and shall be restrained during the test period. The insulation thickness shall not exceed the maximum thickness provided for the piping in the project. Transition time for temperature cycle testing shall not exceed 15 minutes in going from cold to hot and 30 minutes in going from hot to cold. The fluid in the carrier pipe may be water, oil or heat transfer fluid.

Following the hot and cold cycling test, the test sample shall be immersed in a water filled chamber. The pressure on the highest point of the test sample shall not be less than 20 feet of water head pressure subjected over the entire length of the 8 foot test sample of prefabricated pipe. The water shall contain a dye penetrant, which will be used to check for end seal leakage. The pressure in the chamber must be held for not less than 48 hours. Upon completion of this pressure test, the test sample shall be cut open. With the use of a light that will readily show the presence of the dye that was in the water, the test sample shall be inspected. Evidence of the dye inside the test sample shall indicate that the end seal is not acceptable and cannot be certified.

2.5 INSULATION

The Contractor shall comply with EPA requirements in accordance with Section 01670 RECYCLED / RECOVERED MATERIALS.

2.5.1 Factory Applied Insulation

Prefabricated pipe and fittings shall be insulated in the factory. Foam insulation for prefabricated insulated pipe and fittings shall be polyurethane foam meeting the requirements of ASTM C 591 having a density not less than 2 pounds per cubic foot (pcf). The polyurethane foam shall completely fill the annular space between the carrier pipe and the casing. Insulation thickness shall be a minimum of 1 inch. The insulation thermal conductivity factor shall not exceed the numerical value of 0.15 Btu-inch/square foot-degree F-hour at 75 degrees F, when tested in accordance with ASTM C 518. Manufacturer shall certify that the insulated pipe is free of insulation voids.

2.5.2 Field Applied Insulation

Field applied insulation for fittings, and field casing closures, if required, and other piping system accessories shall be polyurethane matching the pipe insulation. Thickness shall match adjacent piping insulation thickness. Buried fittings and accessories shall have field applied polyurethane insulation to match adjacent piping and shall be protected with a covering matching the pipe casing. Shrink sleeves with a minimum thickness of 50 mils shall be provided over casing connection joints.

2.6 CONCRETE VALVE MANHOLES

Concrete valve manholes shall be provided in accordance with Section 02560 VALVES, PIPING AND EQUIPMENT IN VALVE MANHOLES.

2.7 PIPING AND EQUIPMENT IN VALVE MANHOLES

Piping and equipment in valve manholes shall be provided in accordance with Section 02560 VALVES, PIPING, AND EQUIPMENT IN VALVE MANHOLES.

2.8 TREATED WATER

A 30 percent concentration by volume of industrial grade propylene glycol shall be provided for the system. Glycol shall be tested in accordance with ASTM D 1384 with less than 0.5 mils penetration per year for all system metals. The glycol shall contain corrosion inhibitors. Silicate based inhibitors shall not be used. The solution shall be compatible with pump seals, other elements of the system, and water treatment chemicals

used within the system.

PART 3 EXECUTION

3.1 INSTALLATION

For all preinsulated, prefabricated systems, the Contractor shall obtain the services of a trained representative of the pipe system manufacturer to instruct the Contractor's work forces in the installation procedures to ensure that the system is installed in accordance with the manufacturer's published instructions and the plans and specifications. The manufacturer's representative shall be a person who regularly performs such duties for the manufacturer. The Contractor shall furnish the Contracting Officer a list of names of personnel trained and certified by the pipe system manufacturer in the installation of this system. Only personnel whose names appear on the list will be allowed to install the system. The list shall not be more than 1 year old.

3.2 PIPING SYSTEMS

3.2.1 Buried Insulated Systems

Buried insulated systems shall consist of carrier pipe, insulation, casing, end seals, fittings and accessories as specified.

3.3 THRUST BLOCKS

Thrust blocks shall be installed at the locations shown or recommended by the pipe system manufacturer. Thrust blocks may not be required on all systems, and the need for thrust blocks shall be as recommended by the system manufacturer. Thrust blocks, if necessary, shall be installed at all changes in direction, changes in size, valves and terminal ends, such as plugs, caps and tees. Thrust blocks shall be concrete having a compressive strength of not less than 2000 psiafter 28 days and shall be in accordance with Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE. Thrust blocks shall be placed between solid ground and the fitting to be anchored. Unless otherwise indicated or directed, the base and the thrust bearing sides of the thrust blocks shall be poured directly against undisturbed earth. The sides of the thrust blocks not subject to thrust may be poured against forms. Thrust blocks shall be placed so that the joints for all fittings will be accessible for repair wherever possible. No pipe joint shall be embedded in concrete unless the assembly has previously been hydrostatically tested. The thrust blocks shall provide for transfer of thrusts and reactions without exceeding the allowable stress of the concrete and shall be installed in accordance with pipe manufacturer's instructions. In muck or peat, all thrusts shall be resisted by piles or tie rods to solid foundations or by removal of peat or muck which shall be replaced with ballast of sufficient stability to resist thrusts.

3.4 INSTALLATION OF PIPING SYSTEMS

The piping system furnished shall be installed in accordance with the piping system manufacturer's instructions. Piping shall be installed without springing or forcing other than what has been calculated for cold spring. Pipe ends shall have burrs removed by reaming and shall be installed to permit free expansion and contraction without damage to joints or hangers. Nonmetallic pipe cut in the field shall be machined to fit couplings or joints and shall be coated or treated to match standard factory coated ends. Copper tubing shall not be installed in the same

trench with ferrous piping materials. When nonferrous metallic pipe (e.g., copper tubing) crosses any ferrous piping material, a minimum vertical separation of 12 inches shall be maintained between pipes. Connections between different types of pipe and accessories shall be made with transition fittings approved by the manufacturer of the piping system.

3.4.1 Pitching of Horizontal Piping

Horizontal piping shall be pitched at a grade of not less than 1 inch in 20 feet toward the drain points unless otherwise indicated.

3.4.2 Open Ends

Open ends of pipelines and equipment shall be properly capped or plugged during installation to keep dirt and other foreign matter out of the system.

3.4.3 Cutting Prefabricated Piping Sections

Where prefabricated pipe sections are field cut, new end seals similar to the factory applied end seal shall be provided and installed in accordance with the manufacturer's instructions.

3.4.4 Joints

3.4.4.1 Welded Joints

Welded joints between sections of pipe and between pipe and fittings shall be provided where specified or indicated.

3.4.4.2 Threaded Joints

Threaded joints shall not be used belowground. Joints shall be made tight with polytetrafluoroethylene tape applied to the male threads only. Not more than 3 threads shall show after the joint is made up.

3.4.4.3 Grooved Mechanical Joints

Grooves shall be prepared according to the coupling manufacturer's instructions. Grooved fittings, couplings, and grooving tools shall be the products of the same manufacturer. Pipe and groove dimensions shall comply with the tolerances specified by the coupling manufacturer. The diameter of grooves made in the field shall be measured using a "go/no-go" gauge, vernier or dial caliper, narrow-land micrometer, or other method specifically approved by the coupling manufacturer for the intended application. Groove width and dimension of groove from end of pipe shall be measured and recorded for each change in grooving tool setup to verify compliance with coupling manufacturer's tolerances. Grooved joints shall not be used in concealed locations.

3.4.4.4 Brazed Joints

Brazed joints for copper pipe and fittings shall conform to CDA A4015. Brazing alloys melting above 1100 degrees F shall be utilized.

3.4.4.5 Nonmetallic Pipe Joints

Nonmetallic pipe joints shall be installed in accordance with the written instructions of the manufacturer.

3.4.5 Expansion Loops

If expansion compensation is needed, expansion loops and expansion bends (Z- and L- type) shall be factory fabricated of casing, insulation, and carrier piping identical to that furnished for straight runs. Expansion loops and bends shall be properly designed in accordance with the allowable stress limits indicated in ASME B31.1 for the type of pipe used. Expansion loops and bends shall be shipped to the jobsite in the maximum size sections feasible to minimize the number of field joints. The expansion loops and bends casing and insulation where applicable, shall be suitably sized to accommodate pipe movement. Field joints shall be made in straight runs of the expansion loops and bends, and the number shall be kept to a minimum. For steel pipe, cold springing shall not be allowed when sizing the expansion loops and bends, but piping shall be cold sprung one-half the calculated maximum operational expansion during field assembly. Pipe stress in expansion loops and bends shall conform to the requirements for expansion loops specified in ASME B31.1.

3.4.6 Anchors

Anchor design shall be in accordance with the published data of the manufacturer and for prefabricated systems shall be factory fabricated by the prefabricated system manufacturer. In all cases, the design shall be such that water penetration, condensation, or vapor transmission will not wet the insulation.

3.4.7 Field Casing Closures

Field insulation and encasement of joints shall be accomplished after the visual and pressure tests specified are completed. Field insulation and encasement shall be in accordance with the manufacturer's written instructions. Thickness dimensions of the insulation and casing materials shall not be less than those of the adjoining prefabricated section. Insulating material shall be foamed in place polyurethane. Care should be taken to ensure that field closures are made under conditions of temperature and cleanliness required to produce a sound, continuous vapor barrier. A standard polyethylene heat shrink sleeve shall be installed over the casing and shall have a 6 inch minimum overlap at each end.

3.4.8 Underground Warning Tape

Underground warning tape shall be buried above the piping during the trench backfilling and shall be buried approximately 12 inchesdeep. Tape shall be polyethylene tape with metallic core. Tape shall be 6 inches wide and be printed with repetitive caution warnings along its length. Tapes shall be yellow in color with black letters. Tape color and lettering shall not be affected by moisture or other substances contained in the backfill material.

3.4.9 Markers for Underground Piping

Markers for underground piping shall be placed as indicated approximately 2 feet to the right of the distribution system and referenced to the flow direction in the supply line. The marker shall be concrete 6 inch square or round section 2 feet long. The top edge of the marker shall have a minimum 1/2 inch chamfer all around. The letters CHW shall be impressed or cast on the top of the markers to indicate the type of system that is being identified. Each letter shall be formed with a V-shaped groove and shall have a width of stroke at least 1/4 inch at the top and depth of 1/4 inch. The top of the marker shall protrude not more than 2 inches above

finished grade.

3.5 EARTHWORK

Earthwork shall be performed in accordance with Section 02300 EARTHWORK.

3.6 ELECTRICAL WORK

Electrical work shall be performed in accordance with either Section 16375 ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND.

3.7 TESTING

Tests shall be conducted before, during, and after installation of the system. All instruments, equipment, facilities, and labor required to properly conduct the tests shall be provided by the Contractor. Test pressure gauges for a specific test shall have dials indicating not less than 1-1/2 times nor more than 2 times the test pressure. It shall be the Contractor's responsibility to make the pipe system workable at his expense.

3.7.1 Carrier Pipe Cleaning and Testing

Distribution piping shall be tested as required before backfilling and with all joints exposed. The area between joints may be backfilled as necessary to prevent pipe movement.

3.7.1.1 Cleaning Carrier Pipe

Prior to testing, the interior of the carrier pipe shall be cleaned of foreign materials by thorough flushing with clean water. Water shall be circulated at a velocity between 2 and 3 m/s (7 and 10 feet per second) for a minimum of 4 hours. If required, temporary and/or supplementary pumps shall be provided to ensure that required velocity is achieved. System strainers shall be cleaned after the flushing operation is complete. Temporary strainers shall be installed as required. After flushing, the water shall remain in the piping system for testing of the system. All air shall be removed from the system prior to starting the tests.

3.7.1.2 Hydrostatic Pressure Cycling and Tests

Hydrostatic pressure cycling shall have 4 cycles. Each cycle shall consist of a 10 minute period at 150 psig followed by a 5 minute period at a pressure less than 50 psig. The next cycle shall begin immediately following the completion of the previous cycle. Pressure rise and drop shall not exceed 100 psi per minute. The pressure gauge shall be located and the pressure measured at the opposite end of the system from where the pressure is applied. After completion of the hydrostatic pressure cycling, the first hydrostatic pressure test shall be performed. During the first hydrostatic pressure test, the system shall be proven tight at a pressure of 1-1/2 times the working pressure up to 150 psig. This pressure shall be held for a minimum of 1 hour. The method of pressurizing the system shall be disconnected from the system before starting the 1 hour pressure holding period. If the pressure cannot be held for the specified length of time, the cause of pressure loss shall be determined, corrected and the hydrostatic pressure cycling and first hydrostatic pressure test shall be repeated until the system can hold the required pressure for at least 1 hour. After successful completion of the first hydrostatic pressure test, the water shall be drained out of the piping system and the piping system filled with treated water as defined in paragraph TREATED WATER for the

remaining tests and for permanent operation of the system. The hydrostatic pressure cycling and tests shall be repeated after the system has been filled with treated water, using the same test conditions and criteria.

3.7.1.3 Operational Test

Operational test shall be performed on the complete system or testable portions thereof. The test shall be conducted with full design flows and operating temperatures in all runs of piping as if in service, to demonstrate satisfactory function and operating effectiveness. The operational test will have two cycles. Each cycle shall consist of a 6-hour period with treated water in the system at the maximum operating temperature of 60 degrees F and maximum flow rate, and a period of at least 6-hours with no flow. The Contractor shall supply temporary pumps, piping connections, boilers, chillers and the gauges required to circulate the water at the desired temperatures and flow rates. Water shall be circulated through supply lines and returned through the return piping to demonstrate that the pressure drop is compatible with the flow rate and size of pipe and to show that obstructions do not exist in the piping system. Any unusual indicated pressure drop will be investigated and any obstructions removed. Any leaks found shall be repaired. After any obstructions have been removed and any leaks repaired, the operational test shall be repeated until successfully passed.

3.7.1.4 Final Hydrostatic Test

After successful completion of the operational test, the system shall be pressurized to 1-1/2 times the working pressure up to 150 psig. This pressure shall be held for a minimum of 4 hours. Means of pressurizing shall be disconnected prior to the start of the 4-hour pressure holding period. If the pressure cannot be held for the specified length of time, the cause of the pressure loss shall be determined, corrected, and all of the hydrostatic pressure cycling and tests repeated.

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SECTION 02556

GAS DISTRIBUTION SYSTEM
07/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN GAS ASSOCIATION (AGA)

AGA XR0104	(2001) AGA Plastic Pipe Manual for Gas Service

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI B109.2	(2000) Diaphragm-Type Gas Displacement Meters (500 cubic ft./hour Capacity and Over)

ASTM INTERNATIONAL (ASTM)

ASTM D 2513	(2001ae1) Thermoplastic Gas Pressure Pipe, Tubing, and Fittings
ASTM D 2683	(1998) Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing
ASTM D 3261	(1997) Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
ASTM D 3350	(2002a) Polyethylene Plastics Pipe and Fittings Materials

ASME INTERNATIONAL (ASME)

ASME B16.40	(2002) Manually Operated Thermoplastic Gas Shutoffs and Valves in Gas Distribution Systems
ASME B31.8	(2000) Gas Transmission and Distribution Piping Systems

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS SP-25	(1998) Standard Marking System for Valves, Fittings, Flanges and Unions

MASTER PAINTERS INSTITUTE (MPI)

MPI 9	(Jan 2003) Exterior Alkyd Enamel

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC Paint 25	(1997; R 2000) Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II
SSPC SP 1	(1982; R 2000) Solvent Cleaning
SSPC SP 3	(1982; R 2000) Power Tool Cleaning
SSPC SP 7	(2000) Brush-Off Blast Cleaning

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

49 CFR 192	Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise indicated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Materials and Equipment.

A complete list of equipment and materials, including manufacturer's descriptive and technical literature, performance charts and curves, catalog cuts, and installation instructions.

Connections to Existing Lines.

Notification of the Contractor's schedule for making connections to existing gas lines, at least 10 days in advance.

Jointing Polyethylene and Fiberglass Piping; G, AO

A copy of qualified jointing procedures, training procedures, qualifications of trainer, and training test results for joiners and inspectors.

Connection and Abandonment Plan; G, AO.

A copy of procedures for gas line tie in, hot taps, abandonment/removal or demolition, purging, and plugging as applicable in accordance with ASME B31.8.

SD-06 Test Reports

Pressure and Leak Tests; G, AO.

Data from all pressure tests of the distribution system.

1.3 GENERAL REQUIREMENTS

1.3.1 Jointing Polyethylene Piping

Piping shall be joined by performance qualified joiners using qualified procedures in accordance with AGA XR0104. Manufacturer's prequalified joining procedures shall be used. Joints shall be inspected by an inspector qualified in the joining procedures being used and in accordance with AGA XR0104. Joiners and inspectors shall be qualified at the jobsite by a person who has been trained and certified by the manufacturer of the pipe, to train and qualify joiners and inspectors in each joining procedure to be used on the job. Training shall include use of equipment, explanation of the procedure, and successfully making joints which pass tests specified in AGA XR0104. The Contracting Officer shall be notified at least 24 hours in advance of the date to qualify joiners and inspectors.

1.3.2 Standard Products

Materials and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of the products and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. Asbestos or products containing asbestos shall not be used. Equipment shall be supported by a service organization that is, in the opinion of the Contracting Officer, reasonably convenient to the site. Valves, flanges, and fittings shall be marked in accordance with MSS SP-25.

1.3.3 Verification of Dimensions

The Contractor shall become familiar with all details of the work, verify all dimensions in the field, and shall advise the Contracting Officer of any discrepancy before performing the work.

1.3.4 Handling

Pipe and components shall be handled carefully to ensure a sound, undamaged condition. Particular care shall be taken not to damage pipe coating. No pipe or material of any kind shall be placed inside another pipe or fitting after the coating has been applied, except as specified in paragraph INSTALLATION. Plastic pipe shall be handled in conformance with AGA XR0104.

PART 2 PRODUCTS

2.1 PIPE, FITTINGS, AND ASSOCIATED MATERIALS

2.1.1 Polyethylene Pipe, Tubing, Fittings and Joints

Polyethylene pipe, tubing, fittings and joints shall conform to ASTM D 3350 and ASTM D 2513, pipe designations PE 2406 and PE 3408, rated SDR 11 or less, as specified in ASME B31.8. Pipe sections shall be marked as required by ASTM D 2513. Butt fittings shall conform to ASTM D 3261 and socket fittings shall conform to ASTM D 2683. Fittings shall match the service rating of the pipe.

2.1.2 Identification

Pipe flow markings and metal tags for each valve, meter, and regulator

shall be provided as required by the Contracting Officer.

2.1.3 Gas Transition Fittings

Gas transition fittings shall be manufactured steel fittings approved for jointing steel and polyethylene or fiberglass pipe. Approved transition fittings are those that conform to AGA XR0104 requirements for transition fittings. Service riser shall be the anode-less type.

2.2 VALVES

Valves shall be suitable for shutoff or isolation service and shall conform to the following:

2.2.1 Polyethylene Valves

Polyethylene valves shall conform to ASME B16.40. Polyethylene valves, in sizes 1/2 inch to 6 inches, may be used with polyethylene distribution and service lines, in lieu of steel valves, for underground installation only.

2.3 PRESSURE REGULATORS

Regulators shall have ferrous bodies, shall provide backflow protection, and shall be designed to meet the pressure, load and other service conditions.

2.3.1 Service Line Regulators

Pressure regulators for individual service lines shall have ferrous bodies. Regulator shall be capable of reducing distribution line pressure to pressures required for users. Regulators shall be provided where gas will be distributed at pressures in excess of 10 inches of water column. Pressure relief shall be set at a lower pressure than would cause unsafe operation of any connected user. Regulator shall have single port with orifice diameter no greater than that recommended by the manufacturer for the maximum gas pressure at the regulator inlet. Regulator valve vent shall be of resilient materials designed to withstand flow conditions when pressed against the valve port. Regulator shall be capable of regulating downstream pressure within limits of accuracy and shall be capable of limiting the buildup of pressure under no-flow conditions to 50 percent or less of the discharge pressure maintained under flow conditions. Regulator shall have a self contained service regulator. Regulator pipe connections shall not exceed 2 inchsize.

2.4 METERS

Meters shall conform to ANSI B109.2. Meters shall be pipe mounted. Meters shall be provided with over-pressure protection as specified in ASME B31.8 tamper-proof protection. Meters shall be suitable for accurately measuring and handling gas at pressures, temperatures, and flow rates indicated. Meters shall have a pulse switch initiator capable of operating up to speeds of 500 pulses per minute with no false pulses and shall require no field adjustments. Initiators shall provide the maximum number of pulses up to 500 per minute that is obtainable from the manufacturer. It shall provide not less than one pulse per 100 cubic feet of gas.

PART 3 EXECUTION

3.1 EXCAVATION AND BACKFILLING

Earthwork shall be as specified in Section 02300 EARTHWORK.

3.2 GAS MAINS

Pipe for gas mains shall be polyethylene. Polyethylene mains shall not be installed aboveground.

3.3 SERVICE LINES AND EMERGENCY GAS SUPPLY CONNECTION

Service lines shall be constructed of materials specified for gas mains and shall extend from a gas main to and including the point of delivery within 5 feet of the building. The point of delivery is the meter set assembly. The service lines shall be connected to the gas mains as indicated. Where indicated, service line shall be provided with an isolation valve of the same size as the service line. The service lines shall be as short and as straight as practicable between the point of delivery and the gas main and shall not be bent or curved laterally unless necessary to avoid obstructions or otherwise permitted. Service lines shall be laid with as few joints as practicable using standard lengths of pipe. Shorter lengths shall be used only for closures. Polyethylene service lines shall not be installed aboveground.

3.4 WORKMANSHIP AND DEFECTS

Pipe, tubing, and fittings shall be clear and free of cutting burrs and defects in structure or threading and shall be thoroughly brushed and blown free of chips and scale. Defective pipe, tubing, or fittings shall be replaced and shall not be repaired.

3.5 PROTECTIVE COVERING

3.5.1 Protective Covering for Aboveground Piping Systems

Finish painting shall conform to the applicable paragraphs of Section 09900 PAINTING, GENERAL and as follows:

3.5.1.1 Ferrous Surfaces

Shop primed surfaces shall be touched up with ferrous metal primer same type paint as the shop primer. Surfaces that have not been shop primed shall be solvent-cleaned in accordance with SSPC SP 1. Surfaces that contain loose rust, loose mill scale, and other foreign substances shall be mechanically cleaned by power wire brushing in accordance with SSPC SP 3 or brush-off blast cleaned in accordance with SSPC SP 7 and primed with ferrous metal primer in accordance with SSPC Paint 25. Primed surfaces shall be finished with two coats of exterior alkyd paint conforming to MPI 9.

3.5.1.2 Nonferrous Surfaces

Nonferrous surfaces shall not be painted.

3.5.2 Protective Covering for Piping in Valve Boxes and Manholes

Piping in valve boxes or manholes shall receive protective coating as specified for underground steel pipe.

3.6 INSTALLATION

Gas distribution system and equipment shall be installed in conformance with the manufacturer's recommendations and applicable sections of ASME B31.8, AGA XR0104 and 49 CFR 192. Abandoning existing gas piping shall be done in accordance with ASME B31.8. Pipe shall be cut without damaging the pipe. Unless otherwise authorized, cutting shall be done by an approved type of mechanical cutter. Wheel cutters shall be used where practicable. Cutting of plastic pipe shall be in accordance with AGA XR0104. Valve installation in plastic pipe shall be designed to protect the plastic pipe against excessive torsional or shearing loads when the valve is operated and from other stresses which may be exerted through the valve or valve box.

3.6.1 Installing Pipe Underground

Gas mains and service lines shall be graded as indicated. Mains shall have 24 inch minimum cover; service lines shall have 18 inch minimum cover; and both mains and service lines shall be placed on firmly compacted select material for the full length. Where indicated, the main shall be encased, bridged, or designed to withstand any anticipated external loads as specified in ASME B31.8. The encasement material shall be standard weight black steel pipe with a protective coating as specified. The pipe shall be separated from the casing by insulating spacers and sealed at the ends with casing bushings. Trench shall be excavated below pipe grade, bedded with bank sand, and compacted to provide full-length bearing. Laying the pipe on blocks to produce uniform grade will not be permitted. The pipe shall be clean inside before it is lowered into the trench and shall be kept free of water, soil, and all other foreign matter that might damage or obstruct the operation of the valves, regulators, meters, or other equipment. When work is not in progress, open ends of pipe or fittings shall be securely closed by expandable plugs or other suitable means. Minor changes in line or gradient of pipe that can be accomplished through the natural flexibility of the pipe material without producing permanent deformation and without overstressing joints may be made when approved. Changes in line or gradient that exceed the limitations specified shall be made with fittings. When cathodic protection is furnished, electrically insulated joints or flanges shall be provided. When polyethylene or fiberglass piping is installed underground, foil backed magnetic tape shall be placed above the pipe to permit locating with a magnetic detector. After laying of pipe and testing, trench shall be backfilled in accordance with Section 02300 EARTHWORK.

3.6.2 Installing Pipe Aboveground

Aboveground piping shall be protected against dirt and other foreign matter as specified for underground piping. Joints in steel pipe shall be welded; however, joints in pipe 1-1/2 inches in diameter and smaller may be threaded; joints may also be threaded to accommodate the installation of valves. Flanges shall be of the weld neck type to match wall thickness of pipe.

3.7 PIPE JOINTS

Pipe joints shall be designed and installed to effectively sustain the longitudinal pullout forces caused by the contraction of piping or superimposed loads.

3.7.1 Polyethylene Pipe Jointing Procedures

Jointing procedures shall conform to AGA XR0104. Indiscriminate heat fusion joining of plastic pipe or fittings made from different polyethylene resins by classification or by manufacturer shall be avoided if other alternative joining procedures are available. If heat fusion joining of dissimilar polyethylenes is required, special procedures are required. The method of heat fusion joining dissimilar polyethylene resins shall be tested in accordance with paragraph TESTS, subparagraph Destructive Tests of Plastic Pipe Joints.

3.7.2 Connections Between Metallic and Plastic Piping

Connections shall be made only outside, underground, and with approved transition fittings.

3.8 VALVE BOXES

Valve boxes of cast iron not less than 3/16 inch thick shall be installed at each underground valve except where concrete or other type of housing is indicated. Valve boxes shall be provided with locking covers that require a special wrench for removal. Wrench shall be furnished for each box. The word "gas" shall be cast in the box cover. When the valve is located in a roadway, the valve box shall be protected by a suitable concrete slab at least 3 square feet. When in a sidewalk, the top of the box shall be in a concrete slab 2 feet square and set flush with the sidewalk. Boxes shall be adjustable extension type with screw or slide-type adjustments. Valve boxes shall be separately supported, not resting on the pipe, so that no traffic loads can be transmitted to the pipe. Valves shall only be located in valve boxes or inside of buildings.

3.9 PRESSURE REGULATOR INSTALLATION

3.9.1 Service Line Regulators

A shutoff valve, meter set assembly, and service regulator shall be installed on the service line outside the building, 18 inches above the ground on the riser. An insulating joint shall be installed on the inlet side of the meter set assembly and service regulator and shall be constructed to prevent flow of electrical current. A 3/8 inch tapped fitting equipped with a plug shall be provided on both sides of the service regulator for installation of pressure gauges for adjusting the regulator. All service regulator vents and relief vents shall terminate in the outside air in rain and insect resistant fittings. The open end of the vent shall be located where gas can escape freely into the atmosphere, away from any openings into the building and above areas subject to flooding.

3.10 METER INSTALLATION

Meters shall be installed in accordance with ASME B31.8. Permanent gas meters shall be installed with provisions for isolation and removal for calibration and maintenance, and shall be suitable for operation in conjunction with an energy monitoring and control system.

3.11 CONNECTIONS TO EXISTING LINES

Connections between new work and existing gas lines, where required, shall be made in accordance with ASME B31.8, using proper fittings to suit the actual conditions. When connections are made by tapping into a gas main,

the connecting fittings shall be the same size as the pipe being connected.

3.11.1 Connection to Government Owned/Operated Gas Lines

The Contractor shall provide connections to the existing gas lines in accordance with approved procedures. Deactivation of any portion of the existing system shall only be done at the valve location shown on the drawings. Reactivation of any existing gas lines will only be done by the Government. The Contractor's Connection and Abandonment Plan shall be submitted and approved prior to making any connections to existing gas lines. The Contractor shall notify the Contracting Officer, in writing, 10 days before connections to existing lines are to be made.

a. If facilities are abandoned in place, they shall be physically disconnected from the piping system. The open ends of all abandoned facilities shall be purged, capped, plugged or otherwise effectively sealed. Abandonment shall not be completed until it has been determined that the volume of gas or liquid hydrocarbons contained within the abandoned section poses no potential hazard. Air or inert gas may be used for purging, or the facility may be filled with water or other inert material. If air is used for purging, the Contractor shall ensure that a combustible mixture is not present after purging.

b. When a main is abandoned, together with the service lines connected to it, only the customer's end of such service lines is required to be sealed as stipulated above.

c. Service lines abandoned from the active mains shall be disconnected as close to the main as practicable.

d. All valves left in the abandoned segment shall be closed.

e. All abovegrade valves, risers, and vault and valve box covers shall be removed. Vault and valve box voids shall be filled with suitable compacted backfill material.

3.12 TESTS

3.12.1 Destructive Tests of Plastic Pipe Joints

Each day, prior to making polyethylene heat fusion joints, a joint of each size and type to be installed that day shall be made by each person performing joining of plastic pipe that day and destructively tested. At least 3 longitudinal straps shall be cut from each joint. Each strap shall be visually examined, shall not contain voids or discontinuities on the cut surfaces of the joint area, and shall be deformed by bending, torque, or impact, and if failure occurs, it must not initiate in the joint area. If a joint fails the visual or deformation test, the qualified joiner who made that joint shall not make further field joints in plastic pipe on this job until that person has been retrained and requalified. The results of the destructive tests shall be recorded to include the date and time of the tests, size and type of the joints, ambient conditions, fusion iron temperature and names of inspectors and joiners.

3.12.2 Pressure and Leak Tests

The system of gas mains and service lines shall be tested after construction and before being placed in service using air as the test medium. The normal operating pressure for the system is 25 psi. The test

pressure is 50 psi. Prior to testing the system, the interior shall be blown out, cleaned and cleared of all foreign materials. All meters, regulators, and controls shall be removed before blowing out and cleaning and reinstalled after clearing of all foreign materials. Testing of gas mains and service lines shall be done with due regard for the safety of employees and the public during the test. Persons not working on the test operations shall be kept out of the testing area while testing is proceeding. The test shall be made on the system as a whole or on sections that can be isolated. Joints in sections shall be tested prior to backfilling when trenches must be backfilled before the completion of other pipeline sections. The test shall continue for at least 24 hours from the time of the initial readings to the final readings of pressure and temperature. The initial test readings of the instrument shall not be made for at least 1 hour after the pipe has been subjected to the full test pressure, and neither the initial nor final readings shall be made at times of rapid changes in atmospheric conditions. The temperatures shall be representative of the actual trench conditions. There shall be no indication of reduction of pressure during the test after corrections have been made for changes in atmospheric conditions in conformity with the relationship T(1)P(2)=T(2)P(1), in which T and P denote absolute temperature and pressure, respectively, and the numbers denote initial and final readings. During the test, the entire system shall be completely isolated from all compressors and other sources of air pressure. Each joint shall be tested by means of soap and water or an equivalent nonflammable solution prior to backfilling or concealing any work. The testing instruments shall be approved by the Contracting Officer. All labor, materials and equipment for conducting the tests shall be furnished by the Contractor and shall be subject to inspection at all times during the tests. The Contractor shall maintain safety precautions for air pressure testing at all times during the tests.

-- End of Section --

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SECTION 02560

(COLORADO) PAVEMENTS FOR SMALL PROJECTS
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

STATE DEPARTMENT OF HIGHWAYS, DIVISION OF HIGHWAYS, STATE OF COLORADO (CDOT)

CDOT	Standard Specifications for Road and Bridge Construction, 1999 Edition

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO T 180	(1993) Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and an 18-in Drop
AASHTO TP53	(1995) Determining Asphalt Content of Hot Mix Asphalt by the Ignition Method

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 185	(1994) Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
ASTM C 31/C 31M	(1996) Making and Curing Concrete Test Specimens in the Field
ASTM C 39	(1996) Compressive Strength of Cylindrical Concrete Specimens
ASTM C 88	(1998) Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates
ASTM C 143	(1990a) Slump of Hydraulic Cement Concrete
ASTM C 150	(1998) Portland Cement
ASTM C 192	(1995) Making and Curing Concrete Test Specimens in the Laboratory
ASTM C 231	(1997) Air Content of Freshly Mixed Concrete by the Pressure Method

ASTM C 566	(1997) Total Evaporable Moisture Content of Aggregate by Drying
ASTM C 881	(1990) Epoxy-Resin-Base Bonding Systems for Concrete
ASTM D 946	(1982; R 1993) Penetration-Graded Asphalt Cement for Use in Pavement Construction
ASTM D 1461	(1985; R 1994) Moisture or Volatile Distillates in Bituminous Paving Mixtures
ASTM D 1557	(1991; R 1998) Laboratory Compaction Characteristics of Soils Using Modified Effort (56,000 ft-lbf/ft (2,700 kN-m/m))
ASTM D 2041	(1995) Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D 2172	(1995) Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
ASTM D 2726	(1996a) Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixture
ASTM D 2950	(1991; R 1997) Density of Bituminous Concrete in Place by Nuclear Method
ASTM D 3666	(1996a) Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials
ASTM D 4125	(1994) Asphalt Content of Bituminous Mixtures by the Nuclear Method
ASTM D 4867	(1996) Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D 5444	(1994) Mechanical Size Analysis of Extracted Aggregate
ASTM D 5893	(1996) Cold Applied, Single Component Chemically Curing Silicon Joint Sealant for Portland Cement Concrete Pavement
ASTM D 6307	(1998) Asphalt Content of Hot Mix Asphalt by Ignition Method

ASPHALT INSTITUTE (AI)

AI MS-2	(1994) Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types

1.2 MEASUREMENT AND PAYMENT

Section "MEASUREMENTS AND PAYMENT" of the CDOT shall not apply.

1.3 MODIFICATION TO THE CDOT

Reference to "Engineer" and "Department" in the CDOT shall mean the Contracting Officer or Representative.

1.4 DEFINITIONS

For the purposes of this specification, the following definitions apply.

1.4.1 Degree of Compaction

Degree of compaction of aggregate base course, rigid pavement base course, and aggregate surface course shall be expressed as a percentage of the maximum density obtained by the test procedure presented in either ASTM D 1557 or AASHTO T 180, Method D. The maximum density shall be determined in accordance with ASTM D 1557 if the material gradation contains less than 30 percent retained on the 3/4 inch (3/4 inch) sieve or AASHTO T 180 if the material gradation contains more than 30 percent retained on the 3/4 inch (3/4 inch) sieve. In this specification, degree of compaction shall be a percentage of laboratory maximum density.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Plant, Equipment, and Tools.

Job Mix Formula; G, AO.

Proposed JMF.

Mixture Proportions; G, AO.

The report of the Contractor's mixture proportioning studies showing the proportions of all ingredients and supporting information on aggregate and other materials that will be used in the manufacture of concrete, at least 14 days prior to commencing concrete placing operations.

SD-06 Test Reports

Initial Tests; G, AO.

Certified copies of test results for approval not less than 20 days before material is required for the work.

Contractor Quality Control; G, AO.

The Contractor shall submit all QC test results to the Contracting Officer on a daily basis as the tests are performed.

Acceptability of Work; G, AO.

The Contractor shall submit all test results to the Contracting Officer on a daily basis as the tests are performed.

SD-07 Certificates

Asphalt Cement Binder; G, AO.

Copies of certified test data.

Bituminous Tack and Prime Coat; G, AO.

Copies of certified test data.

SD-08 Manufacturer's Instructions

Manufacturer's Recommendations; G, AO.

Where installation procedures, or any part thereof, are required to be in accordance with the manufacturer's recommendations, printed copies of these recommendations, 20 days prior to use on the project. Installation of the material will not be allowed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

1.6 SAMPLING AND TESTING

Sampling and testing shall be the responsibility of the Contractor. Sampling and testing shall be performed by a testing laboratory approved in accordance with Section 01451A CONTRACTOR QUALITY CONTROL. Work requiring testing will not be permitted until the testing laboratory has been inspected and approved. The materials shall be tested to establish compliance with the specified requirements; testing shall be performed at the specified frequency. The Contracting Officer may specify the time and location of the tests.

1.7 APPROVAL OF MATERIAL

The source of the material for aggregate base course, rigid pavement base course, and aggregate surface course shall be selected 30 days prior to the time the material will be required in the work. Tentative approval of material will be based on initial test results. Final approval of the materials will be based on sieve analysis, liquid limit, and plasticity index tests performed on samples taken from the completed and fully compacted base course.

1.8 WEATHER LIMITATIONS

1.8.1 Hot-Mix Asphalt Pavement

The hot-mix asphalt pavement shall not be placed upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 1. The temperature requirements may be waived by the Contracting Officer, if requested; however, all other requirements, including compaction, shall be met.

Table 1. Surface Temperature Limitations of Underlying Course

Mat Thickness, inches	Degrees F
3 or greater	40
Less than 3	45

1.8.2 Bituminous Tack Coat

Bituminous coat shall be applied only when the surface to receive the bituminous coat is dry. Bituminous coat shall be applied only when the atmospheric temperature in the shade is 50 degrees F or above and when the temperature has not been below 35 degrees F for the 12 hours prior to application.

1.8.3 Portland Cement Concrete Pavement

Limitations on the placing of concrete shall conform to Section 412.09, "Limitations of Placing Concrete" of the CDOT.

1.9 PLANT, EQUIPMENT, AND TOOLS

All plant, equipment, and tools used in the performance of the work shall be subject to approval before the work is started and shall be maintained in satisfactory working condition at all times. The equipment shall be adequate and shall have the capability of producing pavements meeting the requirements as set forth herein.

PART 2 PRODUCTS

2.1 HOT-MIX ASPHALT PAVEMENT

Bituminous wearing course shall conform to the requirements specified in the CDOT, Section 401, "PLANT MIX PAVEMENTS- GENERAL, and Section 403, "HOT BITUMINOUS PAVEMENT", except as modified herein. The aggregate shall be Grading SX. Coarse aggregate shall meet the following additional requirements: Percentage of loss shall not exceed 18 after 5 cycles when performed in accordance with ASTM C 88, using magnesium sulfate. The Contractor shall develop the mix design. The laboratory used to develop the job mix formula (JMF) shall meet the requirements of ASTM D 3666. A certification signed by the manager of the laboratory stating that it meets these requirements or clearly listing all deficiencies shall be submitted to the Contracting Officer prior to the start of construction. The asphalt mix shall be dense-graded and composed of a mixture of well-graded aggregate, mineral filler if required, and asphalt material. The hot-mix asphalt shall be designed using Marshall method of mix design contained in AI MS-2 and the criteria shown in Table 3. If the Tensile Strength Ratio (TSR) of the composite mixture, as determined by ASTM D 4867 is less than 75, the aggregates shall be rejected or the asphalt mixture treated with an approved anti-stripping agent. The amount of anti-stripping agent added shall be sufficient to produce a TSR of not less than 75. If an antistrip agent is required, it shall be provided by the Contractor at no additional cost. The hot-mix asphalt pavement shall not contain more than 15 percent reclaimed asphalt pavement.

Disintegrated granite shall not be used for production of any aggregate and the processed aggregate shall contain not more than 2.0 percent by weight

of disintegrated granite particles in that portion of the total sample large than the (#4) sieve and not more than 4.0 percent in any individual sieve size listed in the required aggregate gradation for that portion larger than the sieve (#4). A disintegrated granite particle is defined as a soft, crumbly particle of igneous rock having a visible crystalline grain size and consisting essentially of feldspar and quartz with lesser amounts of micas and/or amphiboles and pyroxenes. Generally, the rock particle will be stained by iron oxide and the feldspar grains will have a dull, highly fractured appearance. The individual mineral grains are so weakly bonded that the particle will crumble under moderate pressure. When tested by Test Method COE CRD-C 130 the particle would be classified as soft.

2.1.1 JMF Requirements

The job mix formula shall be submitted in writing by the Contractor for approval at least 14 days prior to the start of the test section and shall include as a minimum:

a. Percent passing each sieve size.

b. Percent of asphalt cement.

c. Percent of each aggregate and mineral filler to be used.

d. Asphalt viscosity grade or performance grade.

e. Number of blows of hammer per side of molded specimen.

f. Laboratory mixing temperature.

g. Lab compaction temperature.

h. Temperature-viscosity relationship of the asphalt cement.

i. Plot of the combined gradation on the 0.45 power gradation chart, stating the nominal maximum size.

j. Graphical plots of stability, flow, air voids, voids in the mineral aggregate, and unit weight versus asphalt content as shown in AI MS-2.

k. Specific gravity and absorption of each aggregate.

l. Percent natural sand.

m. Percent particles with 2 or more fractured faces (in coarse aggregate).

n. Fine aggregate angularity.

o. Percent flat or elongated particles (in coarse aggregate).

p. Tensile Strength Ratio(TSR).

q. Antistrip agent (if required) and amount.

r. List of all modifiers and amount.

s. Percentage and properties (asphalt content, binder properties, and aggregate properties) of reclaimed asphalt pavement (RAP) if RAP is used.

Table 2. Marshall Design Criteria

Test Property	75 Blow Mix	50 Blow Mix
Stability, pounds minimum	*1800	*1000
Flow, 0.01 inch	8-16	8-18
Air voids, percent	3-5	3-5
Percent Voids in mineral aggregate VMA, (minimum)		
Grading S	13.0	13.0
Grading SX	14.0	14.0
TSR, minimum percent	75	75

* This is a minimum requirement. The average during construction shall be significantly higher than this number to ensure compliance with the specifications.
** Calculate VMA in accordance with AI MS-2, based on ASTM D 2726 bulk specific gravity for the aggregate.

2.1.2 Adjustments to Field JMF

The Laboratory JMF for each mixture shall be in effect until a new formula is approved in writing by the Contracting Officer. Should a change in sources of any materials be made, a new laboratory jmf design shall be performed and a new JMF approved before the new material is used.

2.1.3 Asphalt Cement Binder

Asphalt cement shall conform to the requirements specified in Section 702, "Bituminous Materials" of the CDOT. Asphalt cement binder shall be either viscosity grade AC-10 or Performance Grade (PG) 58-28 or ASTM D 946 penetration grade 85-100. Test data indicating grade certification shall be provided by the supplier at the time of delivery of each load to the mix plant. Copies of these certifications shall be submitted to the Contracting Officer. The supplier is defined as the last source of any modification to the binder.

2.2 BITUMINOUS TACK COAT

Test data indicating grade certification shall be provided by the supplier. Copies of these certifications shall be submitted to the Contracting Officer.

2.2.1 Bituminous Tack Coat

Bituminous tack coat shall conform to the requirements specified in Section 407, "Prime Coat, Tack Coat, and Rejuvenating Agent" of the CDOT. Bituminous material shall be emulsified asphalt designation SS-1 or SS-1h,

or cationic emulsified asphalt designation CSS-1 or CSS-1h.

2.3 PORTLAND CEMENT CONCRETE PAVEMENT

2.3.1 Portland Cement Concrete

Portland cement concrete shall conform to the requirements specified in Section 412, "Portland Cement Concrete Pavement", and Section 601 "Structural Concrete" of the CDOT. Proportioning and required 28-day field compressive strength of the mix shall conform to the requirements of Class "P" concrete. The coarse aggregate shall have a maximum nominal size of 1-1/2 inches. The maximum allowable slump of the concrete shall be 3 inches for pavement constructed with fixed forms. For slipformed pavement, the maximum allowable slump shall be 1-1/4 inches. The water-cement ratio shall not exceed 0.45. The air content of the concrete by volume shall be maintained by the Contractor at 6.0 percent plus or minus 1.0 percent. The Contractor shall submit design mixture proportions, laboratory trial mix, aggregate data, and 28-day compressive strength test results in accordance with Section 601.05, "Proportioning" of the CDOT.

2.3.2 Welded Steel Wire Fabric

Welded steel wire fabric shall conform to ASTM A 185.

2.3.3 Dowels Bars and Tie Bars

Dowel bars and tie bars shall conform to Section 709.03 "Dowel Bars and Tie Bars" of the CDOT.

2.3.4 Epoxy Resin

Epoxy resin materials for embedding dowels shall be two-component materials conforming to the requirements of ASTM C 881, Type IV, Grade 3. Class shall be appropriate for each application temperature to be encountered.

2.4 CONCRETE SIDEWALK AND CURB AND GUTTER

2.4.1 General

Portland cement concrete shall conform to Section 601, "STRUCTURAL CONCRETE", of the CDOT, except as modified herein. Concrete shall be Class B or D. Coarse aggregate shall meet Number 57 or 67 gradation. The portland cement shall be Type I or II, and meet the optional chemical requirements for low alkali when tested in accordance with ASTM C 150.

2.4.2 Sidewalks

Portland cement concrete sidewalk shall conform to the requirements as specified in Section 608, "SIDEWALKS AND BIKEWAYS" of the CDOT.

2.4.3 Curb and Gutter

Portland cement concrete curb and gutter shall conform to the requirements as specified in Section 609, "CURB AND GUTTER", of the CDOT.

2.5 CURING MATERIALS

Curing materials for portland cement concrete pavement and sidewalk shall conform to Section 711.01 "Curing Materials" of the CDOT. Liquid

membrane-forming compound shall be white pigmented type 2.

2.6 JOINT FILLER, BACKER ROD AND SEALANT

Preformed expansion joint filler and backer rod shall conform to Section 705.01, "Joint Fillers" of the CDOT. Cold-applied silicone joint sealant shall conform to ASTM D 5893. Cold-applied silicone sealant for sidewalks shall be gray or stone in color.

PART 3 EXECUTION

3.1 PAVEMENT REMOVAL

Where p.c. concrete and bituminous pavement is to be removed at the locations shown on the drawings, the pavement shall be sawed with a pre-approved concrete saw so as to leave a straight true edge. P.C. concrete pavement removal shall be accomplished by a full depth double sawcut. The initial sawcut shall be located in the pavement area to be removed and shall be 18 inches from the final sawcut. The pavement material and existing base course shall be removed in a manner that will not damage the adjacent in-place pavement to remain. The Contractor must demonstrate that his method of removal will not damage adjacent concrete pavement slabs. Any slab found by the Contracting Officer to be damaged by the Contractor's removal methods shall be fully removed and replaced at no cost to the Government. Pavement material from the removal area shall be disposed of outside the limits of Government controlled land at the Contractor's expense.

3.2 HOT-MIX ASPHALT PAVEMENT

Hot-mix asphalt pavement wearing course shall be constructed to the requirements specified in the CDOT, Section 401, "PLANT MIX PAVEMENTS-GENERAL" and Section 403, "HOT BITUMINOUS PAVEMENT", except as modified herein.

3.2.1 Contractor Quality Control

A standard lot for all requirements will be equal to 8 hours of production.

3.2.1.1 Asphalt Content

A minimum of two tests to determine asphalt content will be performed per lot by one of the following methods: the extraction method in accordance with ASTM D 2172, Method A or B, the ignition method in accordance with the AASHTO TP53or ASTM D 6307, or the nuclear method in accordance with ASTM D 4125, provided the nuclear gauge is calibrated for the specific mix being used. For the extraction method, the weight of ash, as described in ASTM D 2172, shall be determined as part of the first extraction test performed at the beginning of plant production; and as part of every tenth extraction test performed thereafter, for the duration of plant production. The last weight of ash value obtained shall be used in the calculation of the asphalt content for the mixture.

3.2.1.2 Gradation

Aggregate gradations shall be determined a minimum of twice per lot from mechanical analysis of recovered aggregate in accordance with ASTM D 5444. When asphalt content is determined by the nuclear method, aggregate gradation shall be determined from hot bin samples on batch plants, or from

the cold feed on drum mix plants. For batch plants, aggregates shall be tested in accordance with ASTM C 136 using actual batch weights to determine the combined aggregate gradation of the mixture.

3.2.1.3 Temperatures

Temperatures shall be checked at least four times per lot, at necessary locations, to determine the temperature at the dryer, the asphalt cement in the storage tank, the asphalt mixture at the plant, and the asphalt mixture at the job site.

3.2.1.4 Aggregate Moisture

The moisture content of aggregate used for production shall be determined a minimum of once per lot in accordance with ASTM C 566.

3.2.1.5 Moisture Content of Mixture

The moisture content of the mixture shall be determined at least once per lot in accordance with ASTM D 1461 or an approved alternate procedure.

3.2.1.6 Laboratory Air Voids, Marshall Stability and Flow

Mixture samples shall be taken at least four times per lot and compacted into specimens, using 50 blows per side with the Marshall hammer. After compaction, the laboratory air voids of each specimen shall be determined, as well as the Marshall stability and flow.

3.2.2 Acceptability of Work

The pavement will be accepted on the basis of tests made by the the Contractor or its suppliers, as specified herein. The Government may, at its discretion, make check tests to validate the results of the Contractor's testing.

3.2.2.1 Sampling Pavements

Samples of the finished pavement, shall be obtained by the Contractor. The location of the samples shall be as directed and the cores shall be at least 4 inches in diameter. The samples shall be tested by the Contractor to determine conformance to density. Specimens shall be tested in accordance with the requirements of ASTM D 2726. Three samples shall be taken and tested for each 750 tons or less of bituminous mixture placed each day. A minimum of one core shall be obtained from the longitudinal joint. The Contractor shall fill all cores holes with new material and shall meet the requirements as described herein.

3.2.2.2 Laboratory Air Voids

Laboratory air voids will be calculated by determining the Marshall density of each laboratory compacted specimen using ASTM D 2726 and determining the theoretical maximum density of every other sublot sample using ASTM D 2041. Laboratory air void calculations for each sublot will use the latest theoretical maximum density values obtained, either for that sublot or the previous sublot. The mean absolute deviation of the four laboratory air void contents (one from each sublot) from the JMF air void content will be evaluated. The mean absolute deviation shall be less than 1.00. All laboratory air void tests will be completed and reported within 24 hours after completion of construction of each lot.

3.2.2.3 In-place Density

Density of the compacted mixture of the bituminous wearing course shall be between 97 and 100 percent (joint density 95 to 100 percent) of the maximum laboratory compacted density. The maximum laboratory compacted specimens shall be determined from the same mixture taken from the plant in accordance with ASTM D 2041. Densities of the in-place compacted mixture may be determined by the nuclear method in accordance with ASTM D 2950 for Contractor quality control purposes. In any event, the basis of acceptance for density shall be determined from the specific gravity method.

3.2.2.4 Surface Smoothness

After the final rolling, but not later than 24 hours after placement, the surface of the pavement in each entire lot shall be tested by the Contractor in such a manner as to reveal all surface irregularities exceeding the tolerances specified below. If any pavement areas are ground, these areas shall be retested immediately after grinding. All testing shall be performed in the presence of the Contracting Officer. Detailed notes of the results of the testing shall be kept and a copy furnished to the Government immediately after each day's testing. The entire area of the pavement shall be tested in both a longitudinal and a transverse direction on parallel lines. The transverse lines shall be 25 feet or less apart, as directed. The longitudinal lines shall be at the centerline of each paving lane for lines less than 20 feet and at the third points for lanes 20 feetor greater. Other areas having obvious deviations shall also be tested. Longitudinal testing lines shall be continuous across all joints. Where drawings show required deviations from a plane surface (crowns, drainage inlets, etc.), the surface shall be finished to meet the approval of the Contracting Officer. The straightedge shall be held in contact with the surface and moved ahead one-half the length of the straightedge for each successive measurement. The amount of surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between these two high points. The finished surfaces of the pavements shall have no abrupt change of 3/16 inch or more, and all pavements shall be within the tolerances specified in Table 3 when checked with an approved 10 foot straightedge.

Table 3. Straightedge Surface Smoothness--Pavements

Pavement Category	Direction of Testing	Tolerance, inches
All paved areas	Longitudinal	3/16
	Transverse	3/16

3.3 BITUMINOUS TACK COAT

Except as otherwise specified herein, application of bituminous tack coat shall be in accordance with Section 407, PRIME COAT, TACK COAT, AND REJUVENATING AGENT" of the CDOT. Following application of the bituminous material and prior to the application of the pavement, the bituminous coat shall be allowed to cure and to obtain evaporation of any volatiles or moisture.

3.3.1 Bituminous Tack Coat

Contact surfaces of previously constructed pavement, curbs, manholes, and other structures shall be sprayed with a thin coat of bituminous tack coat. Rate of application shall be not less than 0.05 gallon nor more than 0.15 gallon per square yard.

3.4 PORTLAND CEMENT CONCRETE PAVEMENT

Except as otherwise specified herein, portland cement concrete shall be constructed in accordance with the requirements specified in Section 412, "PORTLAND CEMENT CONCRETE PAVEMENT", and Section 601, "STRUCTURAL CONCRETE" of the CDOT. Tining and stationing of concrete is not required.

3.4.1 Spreading

Spreading shall be by machine or hand method. Hand spreading will be permitted only when approved for odd widths or shapes of slabs, or for placement of separate, isolated slabs during removal and replacement type repair operations, or for lanes 50 feet or less in length. Hand spreading, where permitted, shall be done with shovels; rakes shall not be used. Where the concrete is delivered to the form in truck mixers, suitable chutes may be used, provided windrows cover essentially the entire area within the form. In no case shall dumping of concrete in piles be permitted.

3.4.2 Placing Reinforcing Steel

Reinforcement shall be positioned on suitable chairs securely fastened to the subgrade prior to concrete placement, or may be placed on an initial layer of consolidated concrete, with the subsequent layer placed within 30 minutes of the first layer placement.

3.4.3 Joints

Transverse and longitudinal contraction joints shall be of the weakened plane type and shall be formed by sawing. Joints shall be sealed with hot-applied or cold-applied sealant immediately following curing of the concrete or as soon thereafter as weather conditions permit. Before sealing operations commence, a copy of the Manufacturer's Recommendations pertaining to the storage, heating and application of the sealant shall be submitted to the Contracting Officer.

3.4.4 Contractor Quality Control

The Contractor shall perform the inspection and tests described below at the placement and, based upon the results of these inspections and tests, shall take the action required and submit reports as specified. When, in the opinion of the Contracting Officer, the paving operation is out of control, concrete placement shall cease. The Contractor shall furnish all materials, labor, and facilities required for molding, curing, testing, and protecting test specimens at the site and in the laboratory.

3.4.4.1 Air Content Testing

Air content tests shall be made when test specimens are fabricated. In addition, at least two other tests for air content shall be made on randomly selected batches of each separate concrete mixture produced during each 8-hour period of paving. All air content measurements shall be

determined in accordance with ASTM C 231. Whenever air content reaches specified limits, an immediate confirmatory test shall be made. If the second test also shows air content at or exceeding specified limits, an adjustment shall immediately be made in the amount of air-entraining admixture batched to bring air content within specified limits. If the next adjusted batch of concrete is not within specified limits, concrete placement shall be halted until concrete air content is within specified limits.

3.4.4.2 Slump Testing

Slump tests shall be made when test specimens are fabricated. Additional tests shall be made when excessive variation in workability is reported by the placing foreman or Government inspector. All slump tests shall be made in accordance with ASTM C 143. Whenever slump approaches the maximum limit, an adjustment shall immediately be made in the batch masses of water and fine aggregate. When a slump result exceeds the specification limit, no further concrete shall be delivered to the paving site until adjustments have been made and slump is again within the limit.

3.4.4.3 Temperature

The temperature of the concrete shall be measured when strength specimens are fabricated.

3.4.4.4 Concrete Strength Testing

Four (4) cylinders from the same batch shall be fabricated, cured and tested for compressive strength, testing two cylinders at 7-day and two cylinders at 28-day age. A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days. A minimum of one set of four (4) cylinders shall be fabricated, cured and tested for each shift of concrete placement nor less than once for each 250 cubic yards of concrete or fraction thereof. All test cylinders shall be 6 by 12 inch cylinders and shall be fabricated in accordance with ASTM C 192, using only steel molds, cured in accordance with ASTM C 31/C 31M, and tested in accordance with ASTM C 39. Control charts for strength, showing the 7-day and 28-day CQC compressive strengths, and the 28-day required compressive strength, shall be maintained and submitted with weekly CQC Reports.

3.4.5 Acceptability of Work

The pavement will be accepted on the basis of tests made by the Contractor or its suppliers, as specified herein. The Government may, at its discretion, make check tests to validate the results of the Contractor's testing.

3.4.5.1 Strength Requirements

A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days. The strength of the concrete will be considered satisfactory so long as the running average of all sets of three consecutive test results equals or exceeds the specified 28-day field compressive strength and no individual test result falls below the specified strength by more than 500 psi. The Contractor shall furnish all materials, labor, and facilities required for molding, curing, testing, and protecting test specimens at the site and in the laboratory.

3.4.5.2 Surface Smoothness Requirements

The surface of the pavement shall be tested with a 3 m (10 foot) straightedge to identify all surface irregularities exceeding the tolerances specified above. The entire area of the pavement shall be tested in both a longitudinal and a transverse direction on parallel lines approximately 15 feet apart. The straightedge shall be held in contact with the surface and moved ahead one-half the length of the straightedge for each successive measurement. The amount of surface irregularity shall be determined by placing the straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length and measuring the maximum gap between the straightedge and the pavement surface, in the area between these two high points. The finished surfaces of the pavements shall have no abrupt change of 1/8 inch or more. All pavements shall have a surface smoothness tolerance within 1/4 inch in the transverse and longitudinal direction, except that roads and streets shall have tolerance of 3/16 inchin the longitudinal direction. In areas not meeting the specified limits for surface smoothness, high areas shall be reduced to attain the required smoothness, except as depth is limited below. High areas shall be reduced by grinding the hardened concrete with a surface grinding machine after the concrete is 14 days or more old. The depth of grinding shall not exceed 1/4 inch. All pavement areas requiring surface smoothness corrections in excess of the specified limits, shall be removed and replaced. All areas in which grinding has been performed will be subject to the thickness tolerances specified in paragraph Thickness. Any grinding performed on individual slabs with excessive deficiencies shall be performed at the Contractor's own decision without entitlement to additional compensation if eventual removal of the slab is required.

3.4.5.3 Edge Slump Testing and Conformance

When slip-form paving is used, not more than 15 percent of the total free edge of any 10 inch or thicker slab of the slipformed portion of the pavement, shall have an edge slump exceeding 1/4 inch and no slab shall have an edge slump exceeding 3/8 inch. Edge slump shall be determined as above for surface smoothness, at each free edge of each slipformed paving lane constructed. Measurements shall be made at 5 to 15 foot spacings, and as directed. When edge slump exceeding the limits specified above is encountered on either side of the paving lane, additional straightedge measurements shall be made, if required, to define the linear limits of the excessive slump. The concrete for the entire width of the paving lane within these limits of excessive edge slump shall be removed and replaced. Adding concrete or paste to the edge or otherwise manipulating the plastic concrete after the sliding form has passed, or patching the hardened concrete, shall not be used as a method for correcting excessive edge slump.

3.4.5.4 Thickness Determination

The thickness of the pavement shall be determined by the Government on the basis of measurements made on 4 inch diameter cores which shall be drilled by the Contractor, within 7 days after placement of the concrete. Cores shall be drilled at the points directed by the Contracting Officer and there shall be at least one core taken from each separate pavement areas of 4000 sq yd or less. The Contractor shall fill the core holes with an approved non-shrink high strength grout. For pavements less than 8 inches in thickness, when any core shows a deficiency in thickness greater than 1/4 inch, the pavement area represented by the core shall be removed and replaced by the Contractor at no cost to the Government.

3.5 CONCRETE SIDEWALK AND CURB AND GUTTER

The subgrade shall be in a moist condition when concrete is placed. The subgrade shall be prepared and protected to produce a subgrade free from frost when the concrete is deposited. Forms shall be cleaned and coated with form oil each time before concrete is placed. Wood forms may, instead, be thoroughly wetted with water before concrete is placed, except that with probable freezing temperatures, oiling is mandatory.

3.5.1 Sidewalks

Except as otherwise specified herein, portland cement concrete sidewalk shall be constructed in accordance with Section 608, "SIDEWALKS AND BIKEWAYS" of the CDOT. Subgrade shall be placed and compacted in conformance with Section 02300 EARTHWORK. The subgrade shall be tested for grade and cross section by means of a template extending the full width of the sidewalk and supported between side forms. Finished surfaces shall not vary more than 5/16 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/4 inch. All slab edges, including those at formed joints, shall be finished with an edger having a radius of 1/8 inch. Transverse joint shall be edged before brooming, and the brooming shall eliminate the flat surface left by the surface face of the edger. Sidewalk joints shall be constructed to divide the surface into square or rectangular areas. Spacing of transverse and longitudinal contraction and expansion joints shall be as indicated. At the end of the curing period, expansion joints shall be carefully cleaned and filled with cold-applied joint sealant (gray or stone color) as indicated on the drawings. The joint opening shall be thoroughly cleaned before the sealing material is placed. Sealing material shall not be spilled on exposed surfaces of the concrete. Concrete at the joint shall be surface dry and the atmospheric and concrete temperatures shall be above 50 degrees F at the time of application of joint sealing material.

3.5.2 Curb and Gutter

Except as otherwise specified herein, portland cement concrete curb and gutter shall be constructed in accordance with Section 609, "CURB AND GUTTER", of the CDOT. The subgrade shall be tested for grade and cross section by means of a template extending the full width of the curb and gutter. Concrete shall be placed to the section required in a single lift. Consolidation shall be achieved by using approved mechanical vibrators. Curve shaped gutters shall be finished with a standard curb "mule". Approved slipformed curb and gutter machines may be used in lieu of hand placement. Exposed surfaces shall be floated and finished with a smooth wood float until true to grade and section and uniform in texture. The edges of the gutter and top of the curb shall be rounded with an edging tool to a radius as shown on the drawings. Finished surfaces shall not vary more than 1/4 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/4 inch. Contraction joints shall be spaced so that monolithic sections between curb returns will not be less than 5 feet nor greater than 15 feet in length. Contraction joints shall be constructed by means of 1/8 inchthick separators and of a section conforming to the cross section of the curb and gutter. Separators shall be removed as soon as practicable after concrete has set sufficiently to preserve the width and shape of the joint and prior to finishing. Expansion joints shall be formed by means of preformed expansion joint filler material cut and shaped to the cross section of curb and gutter. Expansion joints at least 1/2 inch in width shall be provided

at intervals not exceeding 40 feet Expansion joints and the top 1 inch depth of contraction joints shall be sealed with cold or hot-applied sealant immediately following curing of the concrete or as soon thereafter as weather permits. The joint opening shall be thoroughly cleaned before the sealing material is placed. Sealing material shall not be spilled on exposed surfaces of the concrete. Concrete at the joint shall be surface dry and the atmospheric and concrete temperatures shall be above 50 degrees F at the time of application of joint sealing material. Excess material on exposed surfaces of the concrete shall be removed immediately and concrete surfaces cleaned.

3.5.3 Curing and Protection

Concrete shall be protected against loss of moisture and rapid temperature changes for at least 7 days from the beginning of the curing operation. Concrete shall be cured using one of the following methods

3.5.3.1 Mat Method

The entire exposed surface shall be covered with 2 or more layers of burlap. Mats shall overlap each other at least 6 inches. The mat shall be thoroughly wetted with water prior to placing on concrete surface and shall be kept continuously in a saturated condition and in intimate contact with concrete for not less than 7 days.

3.5.3.2 Impervious Sheeting Method

The entire exposed surface shall be wetted with a fine spray of water and then covered with impervious sheeting material. Sheets shall be laid directly on the concrete surface with the light-colored side up and overlapped 12 inches when a continuous sheet is not used. The curing medium shall not be less than 18 inches wider than the concrete surface to be cured, and shall be securely weighted down by heavy wood planks, or a bank of moist earth placed along edges and laps in the sheets. Sheets shall be satisfactorily repaired or replaced if torn or otherwise damaged during curing. The curing medium shall remain on the concrete surface to be cured for not less than 7 days.

3.5.3.3 Membrane Curing Method

A uniform coating of white-pigmented membrane-curing compound shall be applied to the entire exposed surface of the concrete as specified in Section 412.14, "Curing" of the CDOT.

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SECTION 02630

STORM DRAINAGE
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 198	(1998) Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets
AASHTO M 294	(2002) Corrugated Polyethylene Pipe, 300- to 1200- mm Diameter
AASHTO MP 7	(2001) Specification for Corrugated Polyethylene Pipe, 1350 and 1500 mm Diameter

ASTM INTERNATIONAL (ASTM)

ASTM A 48	(2000) Gray Iron Castings
ASTM A 123	(2002) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 536	(1984; R 1999el) Ductile Iron Castings
ASTM C 76	(2002) Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C 94	(2000) Ready-Mixed Concrete
ASTM C 231	(1997el) Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 270	(2002) Mortar for Unit Masonry
ASTM C 443	(2002) Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C 478	(2002a) Precast Reinforced Concrete Manhole Sections
ASTM C 923	(2002) Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals

ASTM C 924	(2002) Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method
ASTM C 1103	(2002) Joint Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines
ASTM D 1751	(1999) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D 1752	(1984; R 1996e1) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM D 1784	(1999ae1) Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D 2321	(2000) Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D 3034	(2000) Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D 3212	(1996a) Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM F 477	(2002e1) Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F 679	(2001) Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
ASTM F 714	(2001) Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
ASTM F 794	(2001) Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
ASTM F 894	(1998a) Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
ASTM F 949	(2001a) Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
ASTM D 3350	(2002a) Polyethylene Plastics Pipe and Fittings Materials
ASTM F 1417	(1992; R 1998) Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Placing Pipe.

Printed copies of the manufacturer's recommendations for installation procedures of the material being placed, prior to installation.

SD-07 Certificates

Resin Certification.
Pipeline Testing.
Hydrostatic Test on Watertight Joints.
Determination of Density.
Frame and Cover for Gratings.

Certified copies of test reports demonstrating conformance to applicable pipe specifications, before pipe is installed. Certification on the ability of frame and cover or gratings to carry the imposed live load.

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. Before, during, and after installation, plastic pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions unless directed otherwise by the Contracting Officer. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install plastic pipe shall be stored in accordance with the manufacturer's recommendations and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.3.2 Handling

Materials shall be handled in a manner that ensures delivery to the trench in sound, undamaged condition. Pipe shall be carried to the trench, not dragged.

PART 2 PRODUCTS

2.1 PIPE FOR CULVERTS AND STORM DRAINS

Pipe for culverts and storm drains shall be of the sizes indicated and shall conform to the requirements specified.

2.1.1 Concrete Pipe

ASTM C 76, Class III.

2.1.2 PVC Pipe

The pipe manufacturer's resin certification, indicating the cell classification of PVC used to manufacture the pipe, shall be submitted prior to installation of the pipe.

2.1.2.1 Type PSM PVC Pipe

ASTM D 3034, Type PSM, maximum SDR 35, produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.1.2.2 Profile PVC Pipe

ASTM F 794, Series 46, produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.1.2.3 Smooth Wall PVC Pipe

ASTM F 679 produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.1.2.4 Corrugated PVC Pipe

ASTM F 949 produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.1.3 PE Pipe

The pipe manufacturer's resin certification indicating the cell classification of PE used to manufacture the pipe shall be submitted prior to installation of the pipe. The minimum cell classification for polyethylene plastic shall apply to each of the seven primary properties of the cell classification limits in accordance with ASTM D 3350.

2.1.3.1 Smooth Wall PE Pipe

ASTM F 714, maximum DR of 21 for pipes 3 to 24 inches in diameter and maximum DR of 26 for pipes 26 to 48 inches in diameter. Pipe shall be produced from PE certified by the resin producer as meeting the requirements of ASTM D 3350, minimum cell class 335434C.

2.1.3.2 Corrugated PE Pipe

AASHTO M 294, Type S or D, for pipes 12 to 48 inches and AASHTO MP 7, Type S or D, for pipes 54 to 60 inches produced from PE certified by the resin producer as meeting the requirements of ASTM D 3350, minimum cell class in accordance with AASHTO M 294. Pipe walls shall have the following

properties:

Nominal Size (in.)	Minimum Wall Area (square in/ft)	Minimum Moment of Inertia of Wall Section (in to the 4th/in)
12	1.50	0.024
15	1.91	0.053
18	2.34	0.062
24	3.14	0.116
30	3.92	0.163
36	4.50	0.222
42	4.69	0.543
48	5.15	0.543
54	5.67	0.800
60	6.45	0.800

2.1.3.3 Profile Wall PE Pipe

ASTM F 894, RSC 160, produced from PE certified by the resin producer as meeting the requirements of ASTM D 3350, minimum cell class 334433C. Pipe walls shall have the following properties:

Nominal Size (in.)	Minimum Wall Area (square in/ft)	Minimum Moment Of Inertia of Wall Section (in to the 4th/in)	
		Cell Class 334433C	Cell Class 335434C
18	2.96	0.052	0.038
21	4.15	0.070	0.051
24	4.66	0.081	0.059
27	5.91	0.125	0.091
30	5.91	0.125	0.091
33	6.99	0.161	0.132
36	8.08	0.202	0.165
42	7.81	0.277	0.227
48	8.82	0.338	0.277

2.2 DRAINAGE STRUCTURES

2.2.1 Flared End Sections

Sections shall be of a standard design fabricated from same material as the pipe.

2.3 MISCELLANEOUS MATERIALS

2.3.1 Concrete

Unless otherwise specified, concrete and reinforced concrete shall conform to the requirements for 3,000 psi concrete under ASTM C 94. The concrete

mixture shall have air content by volume of concrete, based on measurements made immediately after discharge from the mixer, of 5 to 7 percent when maximum size of coarse aggregate exceeds 1-1/2 inches. Air content shall be determined in accordance with ASTM C 231. The concrete covering over steel reinforcing shall not be less than 1 inch thick for covers and not less than 1-1/2 inches thick for walls and flooring. Concrete covering deposited directly against the ground shall have a thickness of at least 3 inches between steel and ground. Expansion-joint filler material shall conform to ASTM D 1751, or ASTM D 1752, or shall be resin-impregnated fiberboard conforming to the physical requirements of ASTM D 1752.

2.3.2 Mortar

Mortar for pipe joints, connections to other drainage structures, and brick or block construction shall conform to ASTM C 270, Type M, except that the maximum placement time shall be 1 hour. The quantity of water in the mixture shall be sufficient to produce a stiff workable mortar. Water shall be clean and free of harmful acids, alkalies, and organic impurities. The mortar shall be used within 30 minutes after the ingredients are mixed with water. The inside of the joint shall be wiped clean and finished smooth. The mortar head on the outside shall be protected from air and sun with a proper covering until satisfactorily cured.

2.3.3 Precast Reinforced Concrete Manholes

Precast reinforced concrete manholes shall conform to ASTM C 478. Joints between precast concrete risers and tops shall be made with flexible watertight, rubber-type gaskets meeting the requirements of paragraph JOINTS.

2.3.4 Frame and Cover for Gratings

Frame and cover for gratings shall be cast gray iron, ASTM A 48, Class 35B; cast ductile iron, ASTM A 536, Grade 65-45-12. Weight, shape, size, and waterway openings for grates and curb inlets shall be as indicated on the plans.

2.3.5 Joints

2.3.5.1 Flexible Watertight Joints

a. Materials: Flexible watertight joints shall be made with plastic or rubber-type gaskets for concrete pipe. The design of joints and the physical requirements for plastic gaskets shall conform to AASHTO M 198, and rubber-type gaskets shall conform to ASTM C 443. Gaskets shall have not more than one factory-fabricated splice, except that two factory-fabricated splices of the rubber-type gasket are permitted if the nominal diameter of the pipe being gasketed exceeds 54 inches.

b. Test Requirements: Watertight joints shall be tested and shall meet test requirements of paragraph HYDROSTATIC TEST ON WATERTIGHT JOINTS. Certified copies of test results shall be delivered to the Contracting Officer before gaskets or jointing materials are installed. Alternate types of watertight joint may be furnished, if specifically approved.

2.3.5.2 PVC Plastic Pipes

Joints shall be elastomeric gasket type in accordance with the

specification for the pipe and as recommended by the pipe manufacturer.

2.3.5.3 Corrugated PE Plastic Pipe

Water tight joints shall be made using a PVC or PE coupling and rubber gaskets as recommended by the pipe manufacturer. Rubber gaskets shall conform to ASTM F 477.

2.3.5.4 Profile Wall PE Plastic Pipe

Joints shall be gasketed or thermal weld type with integral bell in accordance with ASTM F 894.

2.4 STEEL LADDER

Steel ladder shall be provided where the depth of the manhole exceeds 12 feet. These ladders shall be not less than 16 inches in width, with 3/4 inch diameter rungs spaced 12 inches apart. The two stringers shall be a minimum 3/8 inch thick and 2-1/2 inches wide. Ladders and inserts shall be galvanized after fabrication in conformance with ASTM A 123.

2.5 DOWNSPOUT BOOTS

Boots used to connect exterior downspouts to the storm-drainage system shall be of gray cast iron conforming to ASTM A 48, Class 30B or 35B. Shape and size shall be as indicated.

2.6 RESILIENT CONNECTORS

Flexible, watertight connectors used for connecting pipe to manholes and inlets shall conform to ASTM C 923.

2.7 HYDROSTATIC TEST ON WATERTIGHT JOINTS

2.7.1 Concrete, PVC and PE Pipe

A hydrostatic test shall be made on the watertight joint types as proposed. Only one sample joint of each type needs testing; however, if the sample joint fails because of faulty design or workmanship, an additional sample joint may be tested. During the test period, gaskets or other jointing material shall be protected from extreme temperatures which might adversely affect the performance of such materials. Performance requirements for joints in reinforced concrete pipe shall conform to AASHTO M 198 or ASTM C 443. Test requirements for joints in PVC and PE plastic pipe shall conform to ASTM D 3212.

2.8 EROSION CONTROL RIPRAP

Provide nonerodible rock not exceeding 15 inches in its greatest dimension and choked with sufficient small rocks to provide a dense mass with a minimum thickness of as indicated.

PART 3 EXECUTION

3.1 EXCAVATION FOR PIPE CULVERTS, STORM DRAINS, AND DRAINAGE STRUCTURES

Excavation of trenches, and for appurtenances and backfilling for culverts and storm drains, shall be in accordance with the applicable portions of Section 02300 EARTHWORK.

3.2 BEDDING

The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe. Conform to requirements for bedding in Section 02300 EARTHWORK.

3.2.1 Concrete Pipe Requirements

When no bedding class is specified or detailed on the drawings, concrete pipe shall be bedded in a soil foundation accurately shaped and rounded to conform to the lowest one-fourth of the outside portion of circular pipe or to the lower curved portion of pipe arch for the entire length of the pipe or pipe arch. When necessary, the bedding shall be tamped. Bell holes and depressions for joints shall be not more than the length, depth, and width required for properly making the particular type of joint.

3.2.2 Plastic Pipe

Bedding for PVC and PE pipe shall meet the requirements of ASTM D 2321. Bedding, haunching, and initial backfill shall be either Class IB or II material.

3.3 PLACING PIPE

Each pipe shall be thoroughly examined before being laid; defective or damaged pipe shall not be used. Plastic pipe shall be protected from exposure to direct sunlight prior to laying, if necessary to maintain adequate pipe stiffness and meet installation deflection requirements. Pipelines shall be laid to the grades and alignment indicated. Proper facilities shall be provided for lowering sections of pipe into trenches. Lifting lugs in vertically elongated metal pipe shall be placed in the same vertical plane as the major axis of the pipe. Pipe shall not be laid in water, and pipe shall not be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary.

3.3.1 Concrete, PVC, and Ribbed PVC, Pipe

Laying shall proceed upgrade with spigot ends of bell-and-spigot pipe and tongue ends of tongue-and-groove pipe pointing in the direction of the flow.

3.3.2 Corrugated PE Pipe

Laying shall be with the separate sections joined firmly on a bed shaped to line and grade and shall follow manufacturer's recommendations.

3.4 JOINTING

3.4.1 Concrete Pipe

3.4.1.1 Flexible Watertight Joints

Gaskets and jointing materials shall be as recommended by the particular manufacturer in regard to use of lubricants, cements, adhesives, and other special installation requirements. Surfaces to receive lubricants, cements, or adhesives shall be clean and dry. Gaskets and jointing materials shall be affixed to the pipe not more than 24 hours prior to the installation of the pipe, and shall be protected from the sun, blowing

dust, and other deleterious agents at all times. Gaskets and jointing materials shall be inspected before installing the pipe; any loose or improperly affixed gaskets and jointing materials shall be removed and replaced. The pipe shall be aligned with the previously installed pipe, and the joint pushed home. If, while the joint is being made the gasket becomes visibly dislocated the pipe shall be removed and the joint remade.

3.5 DRAINAGE STRUCTURES

3.5.1 Manholes and Inlets

Construction shall be of reinforced concrete, or precast reinforced concrete; complete with frames and covers or gratings; and with fixed galvanized steel ladders where indicated. Pipe connections to concrete manholes and inlets shall be made with flexible, watertight connectors.

3.5.2 Walls and Headwalls

Construction shall be as indicated.

3.6 STEEL LADDER INSTALLATION

Ladder shall be adequately anchored to the wall by means of steel inserts spaced not more than 6 feet vertically, and shall be installed to provide at least 6 inches of space between the wall and the rungs. The wall along the line of the ladder shall be vertical for its entire length.

3.7 BACKFILLING

3.7.1 Backfilling Pipe in Trenches

Shall conform to Section 02300 EARTHWORK.

3.8 PIPELINE TESTING

3.8.1 Leakage Tests

Lines shall be tested for leakage by low pressure air. Low pressure air testing for concrete pipes shall conform to ASTM C 924. Low pressure air testing for plastic pipe shall conform to ASTM F 1417. Testing of individual joints for leakage by low pressure air or water shall conform to ASTM C 1103.

3.9 FIELD PAINTING

After installation, clean cast-iron frames, covers, gratings, and steps not buried in masonry or concrete to bare metal of mortar, rust, grease, dirt, and other deleterious materials and apply a coat of bituminous paint. Do not paint surfaces subject to abrasion.

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SECTION 02763

PAVEMENT MARKINGS
04/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS TT-P-1952 (Rev D; Canc. Notice 1) Paint, Traffic and Airfield Marking, Waterborne (Metric)

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Equipment; G, AO.

Lists of proposed equipment, including descriptive data, and notifications of proposed Contractor actions as specified in this section. List of removal equipment shall include descriptive data indicating area of coverage per pass, pressure adjustment range, tank and flow capacities, and safety precautions required for the equipment operation.

Composition Requirements.

Manufacturer's current printed product description and Material Safety Data Sheets (MSDS) for each type paint/color proposed for use.

1.3 DELIVERY AND STORAGE

All materials shall be delivered and stored in sealed containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's name, and directions, all of which shall be plainly legible at time of use.

1.4 EQUIPMENT

All machines, tools and equipment used in the performance of the work shall be approved and maintained in satisfactory operating condition. Equipment operating on roads and runways shall display low speed traffic markings and

traffic warning lights.

1.4.1 Paint Application Equipment

The equipment to apply paint to pavements shall be a self-propelled or mobile-drawn pneumatic spraying machine with suitable arrangements of atomizing nozzles and controls to obtain the specified results. The machine shall have a speed during application not less than 5 mph, and shall be capable of applying the stripe widths indicated, at the paint coverage rate specified in paragraph APPLICATION, and of even uniform thickness with clear-cut edges. The paint applicator shall have paint reservoirs or tanks of sufficient capacity and suitable gauges to apply paint in accordance with requirements specified. Tanks shall be equipped with suitable air-driven mechanical agitators. The spray mechanism shall be equipped with quick-action valves conveniently located, and shall include necessary pressure regulators and gauges in full view and reach of the operator. Paint strainers shall be installed in paint supply lines to ensure freedom from residue and foreign matter that may cause malfunction of the spray guns. The paint applicator shall be readily adaptable for attachment of an air-actuated dispenser for the reflective media approved for use. Pneumatic spray guns shall be provided for hand application of paint in areas where the mobile paint applicator cannot be used.

1.4.2 Surface Preparation Equipment

1.4.2.1 Waterblast Equipment

The water pressure shall be specified at 2600 psi at 140 degrees F in order to adequately clean the surfaces to be marked.

1.4.3 Marking Removal Equipment

Equipment shall be mounted on rubber tires and shall be capable of removing markings from the pavement without damaging the pavement surface or joint sealant. Waterblasting equipment shall be capable of producing an adjustable, pressurized stream of water.

1.4.4 Traffic Controls

Suitable warning signs shall be placed near the beginning of the worksite and well ahead of the worksite for alerting approaching traffic from both directions. Small markers shall be placed along newly painted lines or freshly placed raised markers to control traffic and prevent damage to newly painted surfaces or displacement of raised pavement markers. Painting equipment shall be marked with large warning signs indicating slow-moving painting equipment in operation.

1.5 HAND-OPERATED, PUSH-TYPE MACHINES

All machines, tools, and equipment used in performance of the work shall be approved and maintained in satisfactory operating condition. Hand-operated push-type machines of a type commonly used for application of paint to pavement surfaces will be acceptable for marking small streets and parking areas. Applicator machine shall be equipped with the necessary paint tanks and spraying nozzles, and shall be capable of applying paint uniformly at coverage specified. Hand-operated spray guns shall be provided for use in areas where push-type machines cannot be used.

1.6 MAINTENANCE OF TRAFFIC

1.6.1 Parking Areas

When traffic must be rerouted or controlled to accomplish the work, the necessary warning signs, flagpersons, and related equipment for the safe passage of vehicles shall be provided.

1.7 WEATHER LIMITATIONS FOR REMOVAL

Pavement surface shall be free of snow, ice, or slush. Surface temperature shall be at least 40 degrees F and rising at the beginning of operations, except those involving shot or sand blasting. Operation shall cease during thunderstorms. Operation shall cease during rainfall, except for waterblasting and removal of previously applied chemicals. Waterblasting shall cease where surface water accumulation alters the effectiveness of material removal.

PART 2 PRODUCTS

2.1 PAINT

The paint shall be homogeneous, easily stirred to smooth consistency, and shall show no hard settlement or other objectionable characteristics during a storage period of 6 months. Paints for parking lots shall conform to FS TT-P-1952, color as indicated. Pavement marking paints shall comply with applicable state and local laws enacted to ensure compliance with Federal Clean Air Standards. Paint materials shall conform to the restrictions of the local Air Pollution Control District.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Surfaces to be marked shall be thoroughly cleaned before application of the pavement marking material. Dust, dirt, and other granular surface deposits shall be removed by sweeping, blowing with compressed air, rinsing with water or a combination of these methods as required. Rubber deposits, surface laitance, existing paint markings, and other coatings adhering to the pavement shall be completely removed with scrapers, wire brushes, water blast or mechanical abrasion as directed. Areas of old pavement affected with oil or grease shall be scrubbed with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinsed thoroughly after each application. After cleaning, oil-soaked areas shall be sealed with cut shellac to prevent bleeding through the new paint. Pavement surfaces shall be allowed to dry, when water is used for cleaning, prior to striping or marking. Surfaces shall be recleaned, when work has been stopped due to rain.

3.1.1 Pretreatment for Early Painting

Where early painting is required on rigid pavements, a pretreatment with an aqueous solution containing 3 percent phosphoric acid and 2 percent zinc chloride shall be applied to prepared pavement areas prior to painting.

3.1.2 Cleaning Concrete Curing Compounds

On new Portland cement concrete pavements, cleaning operations shall not begin until a minimum of 30 days after the placement of concrete. All new

concrete pavements shall be cleaned by water blasting. The extent of the blasting work shall be to clean and prepare the concrete surface as follows:

a. There is no visible evidence of curing compound on the peaks of the textured concrete surface.

b. There are no heavy puddled deposits of curing compound in the valleys of the textured concrete surface.

c. All remaining curing compound is intact; all loose and flaking material is removed.

d. The peaks of the textured pavement surface are rounded in profile and free of sharp edges and irregularities.

e. The surface to be marked is dry.

3.2 APPLICATION

All pavement markings and patterns shall be placed as shown on the plans.

3.2.1 Paint

Paint shall be applied to clean, dry surfaces, and only when air and pavement temperatures are above 40 degrees F and less than 95 degrees F. Paint temperature shall be maintained within these same limits. New asphalt pavement surfaces and new Portland concrete cement shall be allowed to cure for a period of not less than 30 days before applications of paint. Paint shall be applied pneumatically with approved equipment at rate of coverage specified . The Contractor shall provide guide lines and templates as necessary to control paint application. Special precautions shall be taken in marking numbers, letters, and symbols. Edges of markings shall be sharply outlined.

3.2.1.1 Rate of Application

a. Nonreflective Markings: Paint shall be applied evenly to the pavement surface to be coated at a rate of 105 plus or minus 5 square feet per gallon.

3.2.1.2 Drying

The maximum drying time requirements of the paint specifications will be strictly enforced to prevent undue softening of bitumen, and pickup, displacement, or discoloration by tires of traffic. If there is a delay in drying of the markings, painting operations shall be discontinued until cause of the slow drying is determined and corrected.

3.3 MARKING REMOVAL

Pavement marking, including plastic tape, shall be removed in the areas shown on the drawings. Removal of marking shall be as complete as possible without damage to the surface. Aggregate shall not be exposed by the removal process. After the markings are removed, the cleaned pavement surfaces shall exhibit adequate texture for remarking as specified in paragraph SURFACE PREPARATION. Contractor shall demonstrate removal of pavement marking in an area designated by the Contracting Officer. The demonstration area will become the standard for the remainder of the work.

3.3.1 Equipment Operation

Equipment shall be controlled and operated to remove markings from the pavement surface, prevent dilution or removal of binder from underlying pavement, and prevent emission of blue smoke from asphalt or tar surfaces.

3.3.2 Cleanup and Waste Disposal

The worksite shall be kept clean of debris and waste from the removal operations. Cleanup shall immediately follow removal operations in areas subject to air traffic. Debris shall be disposed of at approved sites.

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SECTION 02791

PLAYGROUND PROTECTIVE SURFACING
06/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 412	(1998a) Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension
ASTM D 648	(2000) Deflection Temperature of Plastics Under Flexural Load
ASTM D 1557	(1991; R 1998) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu.m.))
ASTM D 2047	(1999) Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine
ASTM D 6112	(1997) Compressive and Flexural Creep and Creep-Rupture of Plastic Lumber and Shapes
ASTM E 1912	(1998) Standard Guide for Accelerated Site Characterization for Confirmed or Suspected Petroleum Releases
ASTM F 1292	(1999) Impact Attenuation of Surface Systems Under and Around Playground Equipment
ASTM F 1487	(1998) Standard Consumer Safety Performance Specification for Playground Equipment for Public Use

CONSUMER PRODUCT SAFETY COMMISSION (CPSC)

CPSC Pub No 325	(1994) Handbook for Public Playground Safety

1.2 DEFINITIONS

Critical Height: The fall height at which the protective surfacing meets the requirements of ASTM F 1292.

Designated Play Surface: Any elevated surface for standing, walking, sitting, or climbing; or a flat surface a minimum 2 inches wide having up to a maximum 30 degree angle from horizontal. In some play events the platform surface will be the same as the designated play surface. However, the terms should not be interchanged as they do not define the same point of measurement according to ASTM F 1487.

Head Injury Criteria (HIC): A measure of impact severity that considers the duration over which the most critical section of the deceleration pulse persists as well as the peak level of that deceleration. Head impact injuries are not believed to be life threatening if the HIC does not exceed a value of 1,000.

Impact Attenuation: The ability of protective surfacing to reduce and dissipate the energy of an impacting body.

Loose Fill: Consisting of small independent movable components such as sand, gravel, or wood chip. The percent of fine material in the loose fill affects its compression properties from rainfall.

Maximum Equipment Height: The highest point on the equipment (i.e.: roof ridge, top of support pole.

Play Event: A piece of manufactured playground equipment that supports one or more play activities.

1.3 CHILD SAFETY AND ACCESSIBILITY STANDARDS

The perimeters of the play event use zone shall be measured in accordance with the requirements of Section 02882 PLAYGROUND EQUIPMENT.

1.3.1 CHILD SAFETY

Synthetic surfacing systems installed in the use zones shall meet or exceed the impact attenuating performance requirements as follows. The surfacing critical height value shall yield up to both a maximum 200 G's peak deceleration, and a maximum 1,000 Head Injury Criteria (HIC) value for a head-first fall from the play event in accordance with CPSC Pub No 325 and ASTM F 1292. The protective surfacing shall have a minimum critical height value equal to the height of the highest designated play surface. Measuring fall heights for play events is defined in paragraph FALL HEIGHT. Sand, gravel, and wood surfacing products shall not be installed in use zones.

1.3.2 CHILD ACCESSIBILITY

The accessibility requirement in accordance with ASTM F 1487 includes the following: When the play event use zone consists of a protective surfacing rated as unaccessible, at least one accessible route shall be provided from the use zone perimeter to the play event. When there is more than one of the same play activity provided, only one shall meet accessibility requirements i.e.: one swing seat. When the access and egress points are not the same for a play event, an accessible route shall be provided to both. The accessible route shall access all accessible play events and

elements. The protective surfacings that meet accessibility are synthetic surfacing per ASTM E 1912. When the accessible surface is within the use zone, it shall meet the requirements of paragraph CHILD SAFETY

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Shop Drawings; G, AE.

Playground layouts shown in the Drawings are schematic but accurately represent the various features to be provided. Prior to commencing work in the playgrounds, the Contractor shall prepare complete dimensioned layout plans (shop drawings) indicating (but not limited to): playground equipment and attachment, synthetic surfacing and details, fall zones, turf areas, sidewalks and sidewalk textures, timber boardwalks, underground utilities, fences and gates, rodent protection, storage sheds and details, shade structures and details, berms and topography, planter boxes and details, and wear pads. Playground layouts shown in the Drawings may be slightly adjusted to accommodate specific manufacturer's fall zone requirements and recommended clearances.

Finished Grade and Underground Utilities; G, AE

Finished grade, underground utilities, storm-drainage system and irrigation system status; and location of underground utilities and facilities.

SD-03 Product Data

Synthetic Surfacing; G, AE.

Geotextile Fabric; G, AE.

Manufacturer's descriptive data; catalogue cuts; and the latest edition of ASTM F 1487 and CPSC Pub No 325.

Manufacturer's specifications, handling and storage requirements, installation procedures, and safety data sheets to include warnings and critical height performance standards for synthetic surfacing.

A list to include part numbers of furnished protective surfacing materials and components for synthetic surfacing.

Delivery schedule and manufacturer name for synthetic surfacing plus delivery, storage and handling information.

Impact attenuation and critical height performance for each thickness of synthetic surfacing provided.

Manufacturer's Qualification; G, AO.

Name of the owner or user; service or preventive maintenance provider; date of the installation; point of contact and telephone number; and address for 10 sites.

Site Preparation; G, AO.

Playground equipment and site furnishings installed.

Temperature Limitation; G, AO.

Temperature limitation for applying adhesive.

Adhesive; G, AO.

EPA registered uses, toxicity levels, and application hazards.

Color; G, AE

Two color charts displaying surfacing colors, color granule percentages and finishes.

SD-04 Samples

Synthetic Surfacing; G, AE.

a. Synthetic Surfacing: A minimum 2 by 2 inch sample of each type.

SD-06 Test Reports

Percolation Test; G, AO.

A certified report of inspection, test method used and compliance with recognized test standard shall be described.

Recycled Plastic; G, AO.

Individual component and assembled unit structural integrity test; creep tolerance; deflection tolerance; and vertical load test results. The estimated percentage of recovered material content in the material and components. Life-cycle durability.

Synthetic Surfacing; G, AO.

Chemical composition, color granule percentage, and test results to which material has been subjected; identifying each material and component containing recycled materials and showing the estimated percentage of recovered material content. Freezing temperature life-cycle durability.

SD-07 Certificates

Materials; G, AO.

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include composition and tests to which the material has been subjected.

Manufacturer's Qualification; G, AO.

Certificate of Insurance AA rated for a minimum one million dollars.

Manufacturer's Representative; G, AO.

The individual's name, company name and address, and playground safety training certificate.

Installer's Qualification; G, AO.

The installer's company name and address, and training and experience certification.

Substitution; G, AO.

Technical representative's written approval.

Child Safety and Accessibility Evaluation; G, AO.

Record of measurements and findings by the certified playground safety inspector. Verification that installed protective surfacing meets manufacturer's recommendations and paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS.

SD-10 Operation and Maintenance Data

Maintenance Instruction; G, AO.

Two bound copies of manufacturer's operation and maintenance manuals. The Contractor shall include manufacturer supplied spare parts.

1.5 DELIVERY, STORAGE, AND HANDLING

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery. Protective surfacing material shall be delivered, handled, and stored in accordance with the manufacturer's recommendations. The storage area shall be as designated. The materials shall be stored in a dry, covered area until installed.

1.6 INSPECTION

Protective surfacing material shall be inspected upon arrival at the job site for meeting specified quality. Unacceptable materials shall be removed from the job site.

1.7 MANUFACTURER'S QUALIFICATION

Protective surfacing shall have been installed in a minimum 10 sites and

been in successful service for a minimum 5 year calendar period. The manufacturer shall provide a Certificate of Insurance AA rated for a minimum one million dollars covering both product and general liability.

1.8 INSTALLER'S QUALIFICATION

The installer shall be certified by the manufacturer for training and experience installing the protective surfacing.

1.9 WARRANTY

Furnished protective surfacing shall have a minimum 1 year calendar period warranty.

1.10 TECHNICAL REPRESENTATIVE

1.10.1 Child Development Centers (CDC)

The technical representative for outdoor play areas at CDC shall be the installation Child Development Services (CDS) Coordinator. The design of the CDC outdoor play area shall be based on the developmental play program for the age groups accommodated at the CDC. The play area is designed to support the CDC program and to provide a stage set for creative play. Developmental activities are selected which promote the intellectual, social, emotional and physical growth of the children. The developmental play program is developed by the MACOM CDS Director, installation CDS Coordinator and CDC Director. They are responsible for the developmental play program, child safety and accessibility to meet that program.

1.11 MANUFACTURER'S REPRESENTATIVE

The manufacturer's certified playground safety inspector or the manufacturer's designated certified playground safety representative shall supervise the installation and adjustment of the protective surfacing to verify the installation meets the requirements of the manufacturer, this specification, and paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS.

PART 2 PRODUCTS

2.1 MATERIALS

Materials shall be the standard products of a manufacturer regularly engaged in the manufacture of protective surfacing and shall be similar to surfacing in satisfactory use a minimum 5 year calendar period. Protective surfacing consists of synthetic surfacing.

2.2 SYNTHETIC SURFACING

Synthetic surfacing includes the following: poured-in-place system; tile system; and combination system. The synthetic surfacing consists of impact attenuating substrate covered by a wear surface bonded to produce a unified system; or a uniform material manufactured in such a way that the top portion meets the requirements specified for wear surface.

2.2.1 Subbase

The subbase for synthetic surfacing shall be concrete.

2.2.1.1 Concrete Subbase

Concrete material shall conform to requirements of Divisions 2 and 3.

2.2.2 Impact Attenuating Substrate

The substrate shall be compatible with the wear surface, and shall consist of modular units or poured-in-place. Recycled materials shall conform to EPA requirements in accordance requirements of Division 1.

2.2.2.1 Poured-In-Place Substrate

Poured-in-place substrate shall consist of a 100 percent recycled shredded styrene butadiene rubber (SBR) adhered with a 100 percent solid polyurethane binder to form a resilient, porous material of shredded rubber. Strands of SBR may vary from a minimum 1/50 inch to a maximum 2/25 inch thickness; by a minimum 1/8 inch to a maximum 4/5 inch length. Binder shall be between a minimum 12 percent and a maximum 16 percent of the total weight of the mixture of rubber and urethane; and shall provide 100 percent coating of the particles. Foam rubber will not be accepted in the substrate.

2.2.3 Wear Surface

Wear surfaces consist of the following: a poured-in-place durable, weather-resistant, ultraviolet stable, water permeable material top-coat; an integral component of a tile system. The wear surface shall meet requirements of ASTM D 2047 for a minimum 0.8 coefficient of friction.

2.2.3.1 Poured-in-Place Wear Surface

Poured-in-place wear surface shall consist of ethylene propylene diene monomer (EPDM) particles adhered with a polyurethane binder formulated to produce an even, uniform surface. Particles of EPDM shall meet ASTM D 412 for tensile strength and elongation, and contain a minimum 25 percent of rubber hydrocarbons. Particles of EPDM shall be peroxide or sulfur cured in accordance with the manufacturer. Size of rubber particles shall be between a minimum 1/32 inch, and a maximum 1/8 inch diameter. Binder shall be between a minimum 16 percent and a maximum 21 percent total weight of rubber used in the wear surface, and shall provide 100 percent coating of the particles. Wear surface shall be a minimum 3/8 inch thick. The wear surface shall be porous.

2.2.4 Synthetic Tile

Synthetic tile shall be sized minimum 2'-0" x 2'-0" tile units. Synthetic tile shall be a factory-molded unit consisting of the following: combining impact attenuating substrate and wear surface meeting requirements specified for substrate and wear surface; or a dual-density, uniform material, the top portion of which shall conform to wear surface requirements specified.

2.2.5 Color

The color shall be as selected from manufacturer's standard offering. An EPDM wear surface is preferred for color retention. Black or the following dark colored SBR wear surfaces retain heat and are not acceptable: color combinations containing more than 10 percent black; or color combinations averaging more than 10 percent dark colors.

2.2.6 Sealant

Sealant for tile or combined protective surface systems shall be compatible with the protective surfacing, and shall match the color of the wear surface.

2.2.7 Hardware

Hardware, anchors or fasteners shall be corrosion resistant stainless steel or galvanized steel to anchor the surfacing system securely, in accordance with manufacturer's instructions. Hardware shall provide or be recessed to provide a flat surface and shall be covered by the required depth of protective surfacing.

2.2.8 Binder

Binder for synthetic surfacing shall be nontoxic, weather-resistant, ultraviolet stable, non-hardening, and retaining impact-attenuating performance. It shall be 100 percent solids containing polyurethane, methylene diphenel isocyanate (MDI), or as recommended by the manufacturer. A maximum 2 percent of toluene diphenel isocyanate (TDI) shall be used. Weight of polyurethane shall be between a minimum 8.5 lbs/gal and a maximum 9.5 lbs/gal. Coloring pigments shall be inorganic oxides.

2.2.9 Adhesive

Adhesive shall be a two component polyurethane providing extremely high impact resistant bond and shall be installed as recommended by the manufacturer. The adhesive shall be non-toxic, resistant to ultraviolet light, and safe for children.

2.2.10 Containment Curbs

Containment curbs include the following: recycled plastic, or recycled plastic molded as lumber. Containment curbs shall provide a smooth and hazard-free transition from the protective surfacing to the adjacent surface. Curbs shall be free of sharp vertical edges, protruding elements and trip hazards. Curbs shall be as recommended by the manufacturer. All edges shall be provided with a minimum 1/2 inch radius.

2.2.11 Transition Edge

The transition edge shall be designed to maintain the protective surfacing performance, support the surfacing between changes of material, and shall be concrete in accordance with paragraph CONCRETE CURB. The face of the edge to the subgrade shall be covered with the impact attenuating surface and meet the requirements of paragraph CHILD SAFETY.

2.2.12 Combination System

Combination systems shall consist of combined protective surfacing materials specified. Each component is a part of a manufactured surfacing system. Wear surface shall be of the materials specified.

2.3 GEOTEXTILE FABRIC

Geotextile fabric consists of the following: nonwoven polypropylene sheet; nonwoven 100 percent polyester sheet; or nonwoven needle punched polyester

sheet composed of recycled polyester resins.

2.4 RECYCLED PLASTIC

Recycled plastic shall contain a minimum 85 percent of recycled post-consumer product and shall conform to EPA requirements in accordance with Division 1.

2.4.1 High Density Polyethylene

The material shall be molded of ultraviolet (UV) and color stabilized polyethylene; and consist of a minimum 75% plastic profile of high-density polyethylene, low-density polyethylene, and polypropylene raw material. The material shall be non-toxic and have no discernible contaminates such as paper, foil, or wood. The material shall contain a maximum 3 percent air voids. The material shall be free of splinters, chips, peels, buckling, and cracks. Material shall be resistant to deformation from solar heat gain. Material shall have factory-drilled holes. Components with extra holes not filled by hardware or covered by other components shall be rejected. The material shall not be painted.

2.4.2 Structural Component

Recycled plastic materials will not be used as load bearing structural members.

2.4.3 Recycled Plastic Molded As Lumber

The component shall deflect a maximum 1/360 of the span of the frame when exposed to a uniform live load of 40 lbs/ft, ASTM D 648. The product shall meet the structural integrity test requirements set forth in ASTM F 1487 and ASTM D 6112.

2.5 CURBS

2.5.1 Concrete Curb

Concrete curbs shall conform to Divisions 2 and 3.

2.5.2 Wood

2.5.2.1 Wood Components

Wood components are prohibited.

PART 3 EXECUTION

3.1 SITE PREPARATION

Prior to installing the protective surfacing, verify the playground equipment and site furnishings are installed in accordance with Section 02882 PLAYGROUND EQUIPMENT and approved shop drawings.

3.1.1 Finished Grade and Underground Utilities

The Contractor shall verify that finished grades are as indicated; the smooth grading has been completed in accordance with Division 2; installation of the underground utilities through the area has been completed in accordance with Division 2; installation of the storm-drainage

system through the area has been completed in accordance with Division 2; and the installation of underground sprinklers through the area has been completed in accordance with Division 2. The location of underground utilities and facilities in the area of the operation shall be verified. Damage to underground utilities and facilities shall be repaired at the Contractor's expense.

3.1.2 Layout

The layout of the entire use zone perimeter shall be staked before excavation begins. The location of all elements shall be staked to include the following: All play event configuration access and egress points; and use zone perimeters.

3.1.2.1 Use Zone

The use zone is defined as the area beneath and immediately adjacent to a play structure or equipment that is designated for unrestricted circulation around equipment; and on whose surface it is predicted that a user would land when falling from or exiting the equipment. Also, the use zone is associated with the following terms; "Clear Area," and "Fall Zone". The use zone shall be free of hard surfaces, objects or obstacles that a child could run into or fall on top of and be injured. Use zone perimeters shall not overlap hard surfaces. The use zone perimeter shall meet or exceed the requirements of paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS. Use zone perimeters shall not overlap except for certain play events as defined in ASTM F 1487.

3.1.2.2 Shop Drawings

When the use zone perimeter and play event configuration conflict with the requirements and paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS, shop drawings defining corrective measures shall be submitted to include the following: Adjustment to the play event with the use zone perimeter; use zone perimeter overlaps; fall height and critical height value.

3.1.3 Obstructions Below Ground

When obstructions below ground affect the work, shop drawings showing proposed adjustments shall be provided.

3.1.4 Percolation Test

A test for percolation shall be done to determine positive drainage, to include the lowest elevation of the subgrade. A positive percolation shall consist of a minimum 1 inch per 3 hour period. When a negative percolation test occurs, a shop drawing shall be provided to indicate the corrective measures.

3.1.5 Substitution

Under no circumstances are substitutions to be allowed or protective surfacing to be selected without written approval from the technical representative. Evaluate manufacturer substitutions for the critical height value with meeting the site conditions and paragraph FALL HEIGHT.

3.1.6 Subgrade

Subgrade irregularities shall be corrected to ensure the required depth of

protective surfacing is provided. The subgrade elevation shall be as required by the manufacturer.

3.1.7 Subsurface

The subsurface shall be installed in a true, even plane, and sloped to provide positive drainage as indicated.

3.1.8 Subbase

Tolerance of the concrete subbase shall be within a maximum 1/4 inch in 10 feet. Tolerance of aggregate subbase shall be within a maximum similar to 1/4 inch in 10 feet. Aggregate subbase shall be compacted to a maximum 95 percent, ASTM D 1557. The compaction shall be completed in accordance with Division 2.

3.1.9 Concrete Curing

Concrete subbase shall be cured a minimum of 7 days in accordance with the manufacturer's requirements. Curing compounds and other deleterious substances that adversely affect adhesion shall be removed. Surface shall be clean and dry.

3.1.10 Fall Height

3.1.10.1 General Requirements

The fall height is defined as the vertical distance between the finished elevation of the designated play surface and the finished elevation of the protective surfacing beneath it. For some play events the fall height and platform height are the same, while for other play events the fall height and maximum equipment height are the same, Section 02882 PLAYGROUND EQUIPMENT. When the furnished play event fall height varies from the play event shown, shop drawings shall be provided defining the revised depth or type of protective surfacing to meet or exceed the requirements of paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS.

3.1.10.2 Measuring Fall Height

EQUIPMENT	MEASURING FALL HEIGHT
Composite Equipment Structure:	For a platform surrounded by protective barriers, measure from the platform finished elevation. For a platform surrounded by guardrails, measure from the guardrail top elevation.
Infant Crawl Area:	A maximum 24 inch height, measured from the crawl wall or barrier finished elevation.
Playhouse, Nonclimbable:	Measure from the designated play surface finished elevation.
Spring Rocking Equipment:	Measure from the seat top elevation.

EQUIPMENT	MEASURING FALL HEIGHT
Stationary Equipment, Climbable:	Measure from the maximum equipment height finished elevation.
Stationary Equipment, Nonclimbable:	Measure from the designated play surface finished elevation.
Swing:	Measure from the bottom of the pivot point.

3.2 INSTALLING SYNTHETIC SURFACING SYSTEM

Surfacing edges shall fully adhere to the subsurface. Fully cover the subsurface to ensure no hard surfaces are exposed. Rolled or beveled containment curb or transition edges shall maintain the full thickness required to meet paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS. Material shall cover foundation and cutouts around elements penetrating the surface. Seams shall be the minimum necessary and shall be tight.

3.2.1 Temperature Limitation

Temperature limitation for applying adhesive shall be provided.

3.2.2 Poured-in-Place System

Components of the poured-in-place system shall be mixed mechanically on site in accordance with manufacturer's recommendations. Hand-mixing is prohibited. Installation of poured-in-place surfacing shall be seamless and completely bonded to subsurface. Material shall cover foundations and shall be tight around elements penetrating the surface. Add a minimum 1/16 inch depth to the required surfacing depth to ensure the full depth of material is installed to meet paragraph CHILD SAFETY.

3.2.2.1 Poured-in-Place Substrate

The substrate layer of the poured-in-place system shall be installed in one continuous pour on the same day. When a second pour is required, the edge of the previous work shall be fully coated with polyurethane binder to ensure 100 percent bond with new work. Adhesive shall be applied in small quantities so that new substrate can be placed before the adhesive dries.

3.2.2.2 Poured-in-Place Wear Surface

Wear surface shall be bonded to substrate. Adhesive shall be applied to substrate in small quantities so that wear surface can be applied before adhesive dries. Surface shall be hand troweled to a smooth, even finish. When wear surface is composed of different color patterns, pour shall be continuous and seamless. When seams are required due to color change or field conditions, the adjacent wear surface shall be placed as soon as possible, before initial pour has cured. The edge of initial pour shall be coated with adhesive and wear surface mixture shall be immediately applied.

3.2.3 Tile System

Tile shall be laid out to ensure that end cuts are equal. Tile shall be installed in accordance with manufacturer's instructions. Hardware shall

be as recommended by the manufacturer. Tile shall be bonded to the subsurface with an adhesive approved by the manufacturer. Cutouts shall be filled with sealant according to manufacturer's instructions to eliminate voids at equipment. Sealant shall be the minimum amount necessary, shall not exceed a maximum 3/8 inch width. Where excessive voids occur at cutouts, tile shall be removed and refitted. The tile system shall be installed throughout the play equipment use zone with the proper thickness.

3.2.4 Combination System

The combination system shall consist of modular impact attenuating substrate units, adhered to form a unified system. The substrate shall be covered with a wear surface as specified. Cutouts around equipment shall be properly filled and sealed according to manufacturer's instructions to eliminate voids. Sealant shall be the minimum amount necessary, shall not exceed a maximum 3/8 inch width. Where excessive voids occur at cutouts, the modular substrate shall be removed and refitted. Construction methods shall be employed to ensure full depth installation of specified surfacing material and the finished wear surface.

3.2.4.1 Modular Substrate for Combination System

Modular substrate shall be laid out to minimize small end pieces. The substrate shall be installed in accordance with manufacturer's instructions.

3.2.4.2 Poured-in-Place Substrate for Combination System

Same as paragraph POURED-IN-PLACE SYSTEM.

3.2.4.3 Poured-in-Place Wear Surface for Combination System

Same as paragraph POURED-IN-PLACE SYSTEM.

3.3 RESTORATION AND CLEAN UP

When the operation has been completed, the Contractor shall clean up and protect the site. Existing areas that have been damaged from the operation shall be restored to original condition at the Contractor's expense.

3.3.1 Clean Up

The site and play events shall be cleaned of all materials associated with the operation. Play events and surfaces shall be cleaned of dirt, stains, filings, and other blemishes occurring from shipment and installation. Cleaning methods and agents shall be as recommended by the manufacturer.

3.3.2 Protection

The area shall be protected as required or directed by providing barricades and signage. Signage shall be in accordance with Division 10.

3.3.3 Disposal of Materials

Excess and waste material shall be removed and disposed of off Government property.

3.4 PROTECTIVE SURFACING ACCEPTANCE

3.4.1 Child Safety and Accessibility Evaluation

When the protective surfacing is installed, the play events and protective surfacing shall be thoroughly inspected and measured to verify the playground meets manufacturer's recommendations, paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS, and paragraph FALL HEIGHT as follows: 1) secure anchoring; 2) all hardware and connectors are tight and below the wear surface; 3) sharp points, edges, and protrusions; 4) entanglement; and 5) pinch, crush, and shear points. Measure use zone distances to determine the area is free of hard surfaces, objects or obstacles. Determine exceptions to use zone overlaps occur in accordance with ASTM F 1487. Measure play event fall height and compare to critical height value for the thickness of installed synthetic surfacing. Ensure the slide exit region has the required clear zone. Swing seat clearances are measured while occupied by a maximum user for the age group using the equipment. The finished installation shall have the appearance of a single covering. Protective surfacing that does not comply shall be reinstalled. Hardware that does not comply shall be replaced. Ensure positive drainage for the area and the lowest elevation of protective surfacing subgrade has been provided. A written report describing the results of the evaluation shall be provided.

3.4.2 Spare Parts

Protective surfacing spare parts provided by the manufacturer shall be furnished.

3.4.3 Maintenance Instruction

The manufacturer's operation and maintenance manual describing the recommended preventive maintenance, inspection frequency and techniques, periodic adjustments, lubricants, and cleaning requirements shall be furnished.

3.5 RE-INSTALLATION

When re-installation is required, the following shall be accomplished. Re-install the product as specified. Provide new replacement materials supplied by the manufacturer (material acquisition of replacement parts is the responsibility of the Contractor). Damage caused by the failed installation shall be repaired at the Contractor's expense.

-- End of Section --

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SECTION 02812

IRRIGATION (SPRINKLER) SYSTEM
08/2002

PART 1 GENERAL

1.1 SUMMARY

This section includes the design, performance, and related requirements of the irrigation system. Water distribution and service lines not within the system are specified in Section 02510 WATER DISTRIBUTION SYSTEM.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM B 32	(1996) Solder Metal
ASTM B 43	(1998) Seamless Red Brass Pipe, Standard Sizes
ASTM B 88	(1996) Seamless Copper Water Tube
ASTM D 2241	(1996b) Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
ASTM D 2287	(1996a) Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds
ASTM D 2464	(1999) Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D 2466	(1999) Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40
ASTM D 2564	(1996a) Solvent Cements for Poly(Vinyl Chloride)(PVC) Plastic Piping Systems
ASTM D 2774	(1994) Underground Installation of Thermoplastic Pressure Piping
ASTM D 2855	(1996) Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings
ASTM D 3261	(1997) Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene

	(PE) Plastic Pipe and Tubing
ASTM F 441	(19971999) Chlorinated Poly(Vinyl Chloride).(CPVC) Plastic Pipe, Schedules 40 and 80.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME A112.26.1M	(1984) Water Hammer Arresters.
ASME B16.15	(1985; R 1994) Cast Bronze Threaded Fittings Classes 125 and 250
ASME B16.18	(1984; R 1994) Cast Copper Alloy Solder Joint Pressure Fittings
ASME B16.22	(1995) Wrought Copper and Copper Alloy Solder Joint Pressure Fittings

AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE)

ASSE 1013	(1993) Reduced Pressure Principle Backflow Preventers

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C901	(1996) Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. Through 3 In., for Water Service

COMMERCIAL ITEM DESCRIPTIONS (CID)

CID A-A-51145	(Rev C) Flux, Soldering, Non-Electronic, Paste and Liquid

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)

FCCHR-01	(1993) Manual of Cross-Connection Control

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS SP-80	(1997) Bronze Gate, Globe, Angle and Check Valves

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 2	(1993) Industrial Control and Systems Controllers, Contactors, and Overload Relays Rated Not More Than 2,000 Volts AC or 750 Volts DC
NEMA ICS 6	(1993) Industrial Control and Systems, Enclosures

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (2002) National Electrical Code

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Design Analysis and Calculations; G-AO.

As soon as practicable after award of contract and before acquisition of any materials, submit the system's design analysis and calculations in accordance with the requirements of PART 1 paragraph DESIGN CRITERIA.

Framed Instructions; G-AO.

Labels, signs, and templates of operating instructions that are required to be mounted or installed on or near the product for normal, safe operation.

Field Training; G-AO.

Information describing training to be provided, training aids to be used, samples of training materials to be provided, and schedules and notification of training.

SD-02 Shop Drawings

Irrigation (Sprinkler) System; G-AO.

Detail drawings for valves, sprinkler heads, backflow preventers, automatic controllers, emitter heads, and water hammer arresters. Drawing shall include of a complete list of equipment and materials, and manufacturer's descriptive and technical literature, performance charts and curves, catalog cuts, and installation instructions. Drawings shall also contain complete wiring and schematic diagrams and any other details required to demonstrate that the system has been coordinated and will function as a unit. Drawings shall show proposed system layout, type and number of heads and emitters, zone valves, drain pockets, backflow devices, controllers, and mounting details of controllers. As-built Drawings which provide current factual information showing locations of mains, heads, valves, and controllers including deviations from and amendments to the drawings and changes in the work shall be included.

SD-03 Product Data

Irrigation (Sprinkler) System; G-AO.

As soon as practicable after notice to proceed and before

procurement of any products, the Contractor shall submit, along with the design drawings and calculations, a complete list of products to be incorporated in the work. List shall include catalog numbers, cuts, diagrams, and such other descriptive data as may be required by the authorized Government representative.

SD-10 Operation and Maintenance Data

Irrigation (Sprinkler) System; G-AO.

Six copies of operation and six copies of maintenance manuals for the equipment furnished. One complete set prior to field testing and the remainder upon acceptance. Manuals shall be approved prior to the field training course. Operating manuals shall detail the step-by-step procedures required for system startup, operation, and shutdown. Operating manuals shall include the manufacturer's name, model number, parts list, and brief description of all equipment and their basic operating features. Maintenance manuals shall list routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guides. Maintenance manuals shall include piping and equipment layout, simplified wiring and control diagrams of the system as installed, and system programming schedule.

Zone Operation Schedule; G-AO.

Manuals shall include a schedule of zone operation times and sequence of operations meeting the requirements of PART 1 paragraph PERFORMANCE shall be submitted for approval.

SD-11 Closeout Submittals

Spare Parts; G-AO.

Design analyses and pressure calculations verifying that system will provide the irrigation requirements. Spare parts data for each different item of material and equipment specified, after approval of the related submittals and not later than the start of the field tests. The data shall include a complete list of parts and supplies, with current unit prices and source of supply.

1.4 DEFINITIONS

1.4.1 Compatible (heads):

Delivering an equal amount of water over an equivalent surface area.

1.4.2 Diameter of Coverage:

Diameter of the surface area receiving water (pertains to full or part circle).

1.4.3 Head

1.4.3.1 Bubbler:

Special head with adjustable flows for deep watering.

1.4.3.2 Fill-in-heads:

Not located on the basic symmetrical pattern and/or which may not have the same coverage as the heads in the pattern.

1.4.3.3 Last:

The head on a zone usually farthest from the zone valve and having the least amount of pressure for operation.

1.4.3.4 Pop-up:

Spray or rotary head installed flush with the turf, containing a nozzle which rises above the turf when operating.

1.4.3.5 Rotary:

Head containing a nozzle that rotates, discharging a high velocity water stream.

1.4.3.6 Shrub:

Spray head designed for installation in or above shrubbery and flowers usually with a small diameter of coverage.

1.4.3.7 Spray:

Head containing a nozzle that discharges a fine uniform water spray.

1.4.3.8 Strip:

Spray head designed for watering long, narrow strips of turf or landscaping, usually in a square pattern.

1.4.4 Header:

Water line leading off from a zone valve; subject to pressure only when zone is operating.

1.4.5 Lateral:

Water line leading off from a header to a head.

1.4.6 Main:

Water line under constant pressure, supplying the sprinkler zones; subject to various degrees of water hammer.

1.4.7 Valve

1.4.7.1 Throttle Valve:

Valve used to regulate flow to a zone.

1.4.7.2 Zone Valve:

Valve used to activate/terminate flow to a zone.

1.4.8 Zone:

A section of heads controlled by one valve.

1.5 GENERAL

The contract drawings indicate extent of the sprinkler system. If any departures from the contract drawings are deemed necessary by the Contractor, details of such departures and reasons therefore shall be submitted in writing as soon as practicable after contract award to the authorized Government representative for written approval.

1.6 DESIGN CRITERIA

1.6.1 General

Observance of the criteria established in this paragraph shall not relieve the installed system of meeting the requirements of PART 1 paragraph: PERFORMANCE.

1.6.1.1 Area Coverage

The limits of the area to be covered and type of irrigation coverage shall be as indicated.

1.6.1.2 Design Pressure

Design pressure shall be based on existing static pressure and existing residual pressure as determined by tests performed by the Contractor.

1.6.1.3 Controllers

System shall be automatic with controller(s) and remote controlled valves.

1.6.1.4 Backflow Preventer

A backflow preventer shall be installed on the main between the tie-in to the potable water supply and the first valve off the main.

1.6.1.5 Gate Valve

A gate valve shall be installed upstream of the backflow preventer.

1.6.1.6 Fixed Pipe Risers

Fixed pipe risers above grade shall be copper tubing.

1.6.1.7 Economical and Operational System

The sprinkler system shall be designed utilizing pipe sizes, valves, heads, and zone operation time schedules, to assure an economical and operational system.

1.6.1.8 Mains

Mains shall be manually drainable.

1.6.2 Head Layout

1.6.2.1 Turfed Areas

a. Triangular spacing of heads having the same diameter of coverage shall be used as the basic pattern.

b. Spacing between heads having the same diameter of coverage shall be a maximum of 60% of the diameter or the manufacturer's recommended spacing for a 4 mph wind, whichever is less.

c. Equal spacing shall be used between heads of the same diameter of coverage on rows and between rows of heads.

d. Part-circle heads, compatible with the basic pattern heads, shall be used at borders between turfed areas and buildings, streets, walks, etc. Wasted coverage onto these areas shall be minimized except that spray onto buildings will not be allowed.

e. Fill-in heads shall be used in areas where the basic pattern cannot be maintained or where the pattern is obstructed by trees, shrubs, poles, etc. Future size of plants shall be considered in placing fill-in heads in the latter case. Minimum overlap between fill-in heads and basic pattern heads shall be the overlap between basic pattern heads.

1.6.2.2 Landscaped Areas

a. Spacing of heads

Spacing of headshall be as outlined under Turfed Areas. Plants over 24 inches in height shall receive water from at least two sides.

b. Hight of Risers or Pop-ups

Spray shall be above landscaped plantings from pop-up or fixed riser-mounted shrub heads except where plants will exceed 24 inches in height. Future size of plants shall be used for determining height of risers or pop-ups which shall not exceed 24 inches.

c. Bubblers

Bubblers shall be provided in landscaped areas where semi-flood watering is required. Throttle valves shall be used to control amount of flooding.

d. Quick couplers

Quick couplers shall be provided at 200 feet spacings.

1.6.3 Pipe Sizing

Flow velocities shall be less than 5 ft/sec.

a. Pressure losses due to meters, valves, backflow preventer, pipe,

pipe fittings, elevational differences, etc., shall be used in sizing lines.

b. Pressure available at each head shall be at least the minimum specified by the manufacturer and shall not exceed the maximum specified.

c. Pressure difference between the first and last heads of a spray head zone shall not exceed 30% of the recommended minimum head operating pressure. Differential pressure between the first and last heads of a rotary zone shall not exceed 10 psi.

1.6.4 Zoning

a. Spray and rotary type heads shall not be installed in the same zone. Heads within the same zone shall be compatible.

b. Number of zones established shall minimize system operation time within economic reason as to size of pipe and number of operating valves required.

c. Separate zones shall be provided for landscaped areas where watering requirements are different from the turfed areas.

1.6.5 Electrical

1.6.5.1 Rules

The installation shall conform to the requirements of NFPA 70, unless more stringent requirements are indicated herein.

1.6.5.2 Coordination

The contract drawings indicate the extent and general location of equipment. The Contractor shall become familiar with all details of the work and verify all dimensions in the field so that the equipment will be properly located and readily accessible. Equipment shall be located to avoid interference with mechanical or structural features. If any conflicts occur necessitating departures from the drawings, details and reasons for departures shall be submitted and approved prior to implementing any change.

1.6.5.3 Workmanship

Materials and equipment shall be installed in accordance with recommendations of the manufacturer and as shown.

1.6.5.4 Wiring

Wiring between controllers and valves shall be Type UF cable in accordance with Article 339 of NFPA 70. Wiring shall comply with the manufacturer's recommendations.

1.6.6 Design Analysis and Calculations

As soon as practicable after award of contract and before acquisition of any materials, a layout plan, including calculations, showing proposed sprinkler system and all applicable appurtenances therefor shall be submitted for written approval.

1.7 PERFORMANCE

See Notes on Irrigation Drawings for operating times.

Any zone or part of a zone which does not meet the requirements of the previous paragraph within the schedule of operating times, in the opinion of the Contracting Officer, shall be redesigned and the appropriate number and type of heads added to provide the specified coverage at no additional cost to the Government.

1.7.1 Zone Operation Schedule

Develop a schedule of zone operation times and sequence of operations meeting the requirements of PART 1 paragraph PERFORMANCE for the Operation and Maintenance Manuals.

1.8 DELIVERY AND STORAGE

Products delivered to site shall be inspected for damage, unloaded, and stored with the minimum of handling. Products shall be protected from the weather; excessive humidity and temperature variation; direct sunlight (in the case of plastic or rubber materials); and dirt, dust, or other contaminants. Do not store products directly on the ground. Inside of pipes and fittings shall be kept free of dirt and debris.

1.9 HANDLING

Products shall be handled in such a manner as to insure delivery to the trench in sound undamaged condition. Pipe shall be carried to the trench, not dragged. Gasket materials and plastic materials that are not to be installed immediately shall not be stored in the direct sunlight. Valves, controllers, sprinkler heads, etc., shall be removed from protective cover only upon installation.

1.10 FIELD MEASUREMENTS

The Contractor shall verify all dimensions in the field and shall advise the Contracting Officer of any discrepancy before performing the work.

PART 2 PRODUCTS

2.1 IRRIGATION (SPRINKLER) SYSTEM

2.1.1 General Materials and Equipment Requirements

2.1.1.1 Standard Products

Materials and equipment shall be the standard products of a manufacturer who has produced similar systems which have performed well for a minimum period of 2 years prior to bid opening. Equipment shall be supported by a service organization that is, in the opinion of the Contracting Officer, reasonably convenient to the site.

2.1.1.2 Nameplates

Each item of equipment shall have the manufacturer's name, address, type or style, model or serial number, and catalog number on a plate secured to the item of equipment.

2.1.1.3 Extra Stock

The following extra stock shall be provided: Two sprinkler heads of each size and type, two valve keys for operating manual valves, two wrenches for removing and installing each type of head, two quick coupler keys and hose swivels, and four irrigation controller housing keys.

2.1.2 Piping Materials

2.1.2.1 Copper Tubing and Associated Fittings

Tubing shall conform to requirements of ASTM B 88, Type K. Fittings shall conform to ASME B16.22 and ASME B16.18, solder joint. Solder shall conform to ASTM B 32 95-5 tin-antimony. Flux shall conform to CID A-A-51145, Type I.

2.1.2.2 Red Brass Pipe and Associated Fittings

Pipe shall conform to requirements of ASTM B 43, regular. Fittings shall be Class 250, cast bronze threaded conforming to the requirements of ASME B16.15.

2.1.2.3 Polyvinyl Chloride (PVC) Pipe, Fittings and Solvent Cement

Pipe shall conform to the requirements of ASTM D 2241, PVC 1120 SDR 21, Class 200. Solvent welded socket type fittings shall conform to requirements of ASTM D 2466, Schedule 40. Threaded type fittings shall conform to requirements of ASTM D 2464, Schedule 80. Solvent cement shall conform to the requirements of ASTM D 2564.

2.1.2.4 Polyethylene (PE) Plastic Piping

Pipe shall conform to AWWA C901, outside diameter base with dimension ratio (DR) of 9.3 to provide 150 psi minimum pressure rating. Fittings shall conform to ASTM D 3261, DR of 9.3.

2.1.2.5 Dielectric Fittings

Fittings shall conform to ASTM F 441, Schedule 80, CPVC threaded pipe nipples, 4-inch minimum length.

2.1.2.6 Emitter Hose and Distribution Tubing

Emitter hose and distribution tubing shall conform to ASTM D 2287, maximum inside diameter of 1/2-inch, minimum wall thickness of 90 mils, vinyl plastic extruded from non-rigid chloride, integrally algae-resistant, homogeneous throughout, smooth inside and outside, free from foreign materials, cracks, serrations, blisters and other effects. Slip fittings shall be provided.

2.1.3 Sprinkler and Emitter Heads

2.1.3.1 Pop-Up Spray Heads

Pop-up spray heads lay flush with housing, then pop up when water pressure 20 psi is activated in system. The rising member supporting the nozzle shall be identical on full, half, third or quarter pattern sprinklers so that nozzles will be interchangeable. The sprinkler head

shall be designed to be adjustable for coverage and flow. The nozzle shall be removable so head does not have to be removed for flushing or cleaning. Nozzle rises a minimum of 4 inches above the body. The body shall be constructed with a 1/2 inch female thread for installation in a fixed underground pipe system.

a. Shrubbery Sprinkler Heads

Sprinkler heads shall be conical spray with adjustable or non-adjustable coverage and designed for permanent aboveground mounting on riser or pop-ups at a height compatible with ground covers. Provide brass nozzles.

2.1.3.2 Rotary Pop-Up Sprinklers

Provide sprinklers shall of covering maximum practical diameter 4 inch pop-ups. Construction shall be high impact molded plastic with filter screen, reducible watering radius, and choice of all nozzles and have adjustable radius capabilities.

2.1.3.3 Bubbler Sprinkler Heads

Heads shall be multiple-spray bubbler with adjustable flow and designed for permanent aboveground mounting on risers.

2.1.3.4 Emitter Heads

Emitter heads shall be self-cleaning, pressure compensating diaphragm with one or six self-piercing barbed outlets; each capable of emitting from 1/4 to 2 gallons per hour flow. Emitter body shall be ultraviolet stabilized, algae, and heat resistant plastic construction.

2.1.3.5 Underground Drip Emitter

Proprietary piping with built-in drip emitters constructed specifically for underground use. Flushing emitters with particle and back-flow blocking provisions.

2.1.4 VALVES

2.1.4.1 Gate Valves, Less than 3 inches

Gate valves shall conform to the requirements of MSS SP-80, Type 1, Class 150, threaded ends.

2.1.4.2 Angle Valves, Less Than 2 1/2 inches

Angle valves shall conform to the requirements of MSS SP-80, Type 3, Class 150 threaded ends.

2.1.4.3 Quick Coupling Valves

Quick coupling valves shall have brass parts and shall be two-piece unit consisting of a coupler water seal valve assembly and a removable upper body to allow spring and key track to be serviced without shutdown of main. Lids shall be lockable vinyl with spring for positive closure on key removal.

2.1.4.4 Remote Control Valves, Electrical

Remote control valves shall be solenoid actuated globe valves of 3/4- to 3-inch size, suitable for 24 volts, 60 cycle, and designed to provide for shut-off in event of power failure. Valve shall be cast bronze or brass or plastic housing suitable for service at 150 psi operating pressure with external flow control adjustment for shut-off capability, external plug at diaphragm chamber to enable manual operation, filter in control chamber to prevent valve body clogging with debris, durable diaphragm, and accessibility to internal parts without removing valve from system.

2.1.4.5 Drain Valves

a. Manual Valves

Manual valves shall conform to requirements of MSS SP-80, Type 3, Class 150 threaded ends for sizes less than 2 1/2 inches.

2.1.4.6 Pressure Regulating Master Valve

Pressure regulating master valve shall be automatic mechanical self-cleaning, self-purging control system having an adjustable pressure setting operated by a solenoid on alternating current with 0.70 amperes at 24 volts. Valve shall close slowly and be free of chatter in each diaphragm position, have manual flow stem to adjust closing speed and internal flushing, and one inlet tappings capable of being installed as a straight pattern valve. Body shall be cast bronze or brass with removable brass seat serviceable from top without removing valve body from system. Valve shall operate at 150 psi working pressure and pilot range from 10 to 125 psi.

2.1.4.7 Backflow Preventers

Reduced pressure principle assemblies, shall be tested, approved, and listed in accordance with FCCHR-01. Reduced pressure principle backflow preventers shall be in accordance with ASSE 1013.

a. Reduced Pressure Type Backflow Preventers

Backflow preventers shall be Class 150 flanged bronze or brass mounted gate valve and strainer, 304 stainless steel or bronze, internal parts. Total pressure drop through complete assembly shall be a maximum of 10 psi at rated flow. Piping shall be red brass pipe and fittings. Strainers shall be bronze or brass construction with gasket caps. Units shall have 200-mesh stainless steel screen elements.

2.1.5 ACCESSORIES AND APPURTENANCES

2.1.5.1 Valve Keys for Manually Operated Valves

Valve keys shall be 1/2-inch diameter by 3 feet long, tee handles and keyed to fit valves.

2.1.5.2 Valve Boxes

Valve boxes shall be cast iron, plastic lockable, or precast concrete for each gate valve, manual control valve, and remote control valve. Box sizes shall be adjustable for valve used. Word "IRRIGATION" shall

be cast on cover. Shaft diameter of box shall be minimum 5-1/4 inches. Cast iron box shall have bituminous coating.

2.1.5.3 Concrete Pads

Concrete pads shall be precast or cast-in-place reinforced concrete construction for reduced pressure type backflow preventers. As specified in Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

2.1.5.4 Pressure Gauges

Pressure gauges shall be single style pressure gauge for water with 4-1/2-inch-dial brass or aluminum case, bronze tube, gauge cock, pressure snubber, and siphon. Scale range shall be suitable for irrigation sprinkler systems.

2.1.5.5 Service Clamps

Service clamps shall be bronze flat, double strap, with neoprene gasket or "O"-ring seal.

2.1.5.6 Water Hammer Arresters

Water hammer arrester shall conform to the requirements of ASME A112.26.1M; stainless steel construction with an encased and sealed bellows compression chamber.

2.1.5.7 Emitter Head Accessories

a. Strainer

Strainer shall be provided at inlet to each drip line. Strainer shall have stainless steel screen having equivalent of 140-mesh filtration capacity and incorporate flush valves within strainer to clean screen without disassembling unit.

b. Pressure Regulator

Pressure regulator shall be provided at each drip system if supply pressure exceeds 50 psi.

c. Riser Adapters

Riser adapters shall be provided with a rigid piping system.

d. Tubing Stakes

Tubing stakes shall be plastic coated steel, or other non-corrosive strong material to secure tubing.

e. Emitter Outlet Check Valve (Bug Cap)

Check valves shall be provided at end of each emitter outlet distribution line. Valves shall permit free flow of water with minimum restriction; prevent back siphoning, entry of insects, and contamination into outlet ports.

f. Access Sleeve

Access sleeve shall be provided at buried emitters placed in covered boxes. Lids of access sleeve shall be secured with removable lugs. Drip hose in both vertical and horizontal axis shall be secured.

g. Closure Caps

Closure caps shall be in accordance with manufacturer's recommendations.

2.1.6 Automatic Controllers, Electrical

Controller shall conform to the requirements of NEMA ICS 2 with 120-volt single phase service, operating with indicated stations, and grounded chassis. Enclosure shall conform to NEMA ICS 6 Type 3R, with locking hinged cover, wall-mounted. Controller shall be programmed for various schedules by setting switches and dials equipped with the following features: A switch for each day of week for three schedules, allowing each station to be scheduled individually as to days of watering; a minute switch for each station with a positive increment range of 3 to 60 minutes, set time within one percent; a switch allowing selected schedules to be repeated after each completion of initial watering schedule and allowing each operation to be scheduled throughout a 24-hour day; a circuit breaker for surge protection; and circuit for a 9-volt rechargeable NiCad battery. Controller shall have sensors for wind, rain, and temperature; equal to Hunter MWS-RF.

2.1.7 Electrical Work

Wiring and rigid conduit for electrical power shall be in accordance with NFPA 70, and Section 16375 ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND.

2.1.8 Concrete

Concrete shall have a compressive strength of 4,000 psi at 28 days as specified in Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

2.1.9 Water Supply Main Materials

Tapping sleeves, service cut off valves, and connections to water supply mains shall be in accordance with Section 02510 WATER DISTRIBUTION SYSTEM.

2.1.10 Insulating Joints

Insulating joints and dielectric fittings shall be in accordance with Section 02510 WATER DISTRIBUTION SYSTEM.

PART 3 EXECUTION

3.1 INSTALLATION

Sprinkler system shall be installed after site grading has been completed. Excavation, trenching, and backfilling for sprinkler system shall be in accordance with the applicable provisions of Section 02300 EARTHWORK, except as modified herein.

3.1.1 Trenching

Trench around roots shall be hand excavated to pipe grade when roots of

2 inches diameter or greater are encountered. Trench width shall be 4 inches minimum or 1-1/2 times diameter of pipe, whichever is wider. Backfill shall be hand tamped over excavation. When rock is encountered, trench shall be excavated 4 inches deeper and backfilled with silty sand (SM) or well-graded sand (SW) to pipe grade. Trenches shall be kept free of obstructions and debris that would damage pipe. Subsoil shall not be mixed with topsoil. Existing concrete walks, drives and other obstacles shall be bored at a depth conforming to bottom of adjacent trenches. Pipe sleeves for bored pipe shall be two pipe diameters larger than sprinkler pipe.

3.1.2 Piping System

3.1.2.1 Cover

Underground piping shall be installed as to meet the minimum depth of backfill cover specified.

3.1.2.2 Clearances

Minimum horizontal clearances between lines shall be 4 inches for pipe 2 inches and less; 12 inches for 2-1/2 inches and larger. Minimum vertical clearances between lines shall be 1-inch.

3.1.2.3 Minimum Slope

Minimum slope shall be 6 inches per 100 feet in direction of drain valves.

3.1.3 Piping Installation

3.1.3.1 Polyvinyl Chloride (PVC) Pipe

a. Solvent-cemented joints shall conform to the requirements of ASTM D 2855.

b. Threaded joints shall be full cut with a maximum of three threads remaining exposed on pipe and nipples. Threaded joints shall be made tight without recourse to wicks or fillers, other than polytetrafluoroethylene thread tape.

c. Piping shall be joined to conform with requirements of ASTM D 2774 or ASTM D 2855, and pipe manufacturer's instructions. Pipe shall be installed in a serpentine (snaked) manner to allow for expansion and contraction in trench before backfilling. Pipes shall be installed at temperatures over 40 degrees F.

3.1.3.2 Soldered Copper Tubing

Pipe shall be reamed and burrs removed. Contact surfaces of joint shall be cleaned and polished. Flux shall be applied to male and female ends. End of tube shall be inserted into fittings full depth of socket. After soldering, a solder bead shall show continuously around entire joint circumference. Excess acid flux shall be removed from tubings and fittings.

3.1.3.3 Insulating Joints

Insulating and dielectric fittings shall be provided where pipes of

dissimilar metal are joined and at connections to water supply mains as shown. Installation shall be in accordance with Section 02510 WATER DISTRIBUTION SYSTEM.

3.1.4 Valves

3.1.4.1 Manual Valves

Valves shall be installed in a valve box extending from grade to below valve body, with a minimum of 4 inches cover measured from finish grade to top of valve stem.

3.1.4.2 Automatic Valves

Valve shall be set plumb in a valve box extending from grade to below valve body, with minimum of 4-inch cover measured from grade to top of valve. Install automatic valves beside sprinkler heads with a valve box.

3.1.4.3 Drain Valves

Entire system shall be manually or automatically drainable. Low points of system shall be equipped with drain valve draining into an excavation containing 1 cubic foot gravel. Gravel shall be covered with building paper then backfilled with excavated material and 6 inches of topsoil.

3.1.5 Sprinklers and Quick Coupling Valves

Sprinklers and valves shall be installed plumb and level with terrain.

3.1.6 Installation of Drip Irrigation System

3.1.6.1 Emitter Hose

Emitter laterals shall be buried 6 inches deep. Connections shall be solvent welded in accordance with manufacturer's recommendation to standard weight Schedule 40 PVC fittings and bushings. Hose shall be installed in a serpentine manner. When cutting hose, shearing tool such as a pipe cutter, knife, or shears shall be used. Manufacturer's recommended tool and procedures when punching hose for emitters shall be followed.

3.1.6.2 Emitter Heads

Emitters shall be installed in a plastic emitter box. Emitter on a rigid PVC nipple shall be connected to PVC drip lateral with a tee or elbow. Tubing shall be attached to barbed fitting and daylight distribution tubing at root ball secured with stake, with bug cap at end of secured distribution tubing. After installing emitters and before operating system, end of drip lateral shall be opened and flushed clean. The number of emitters on a line shall not exceed manufacturer's recommendations for that hose or distribution tubing size and length.

3.1.6.3 Tubing Stakes

Main irrigation line shall be secured with stakes where line is aboveground. Stakes shall be spaced to ensure that hose does not shift location in presence of foot traffic, operations, gravity on slope installations, or environmental effects. Discharge of the emitter

distribution tubing shall be staked to ensure that discharge point of emitter will be maintained at specified position in relation to plant material to be irrigated.

3.1.7 Backflow Preventers

Backflow preventer shall be installed in new connection to existing water distribution system, between connection and control valves. Backflow preventer shall be installed with concrete pads.

3.1.7.1 Reduced Pressure Type

Reduced pressure type shall be installed as follows: Flush pipe lines prior to installing device and protect device by a strainer located upstream. Device shall not be installed in pits or where any part of device could become submerged in standing water.

3.1.8 Control Wire and Conduit

3.1.8.1 Wires

Low voltage wires may be buried beside pipe in same trench. Rigid conduit shall be provided where wires run under paving. Wires shall be number tagged at key locations along main to facilitate service. One control circuit shall be provided for each zone and a circuit to control sprinkler system.

3.1.8.2 Loops

A 12-inch loop of wire shall be provided at each valve where controls are connected.

3.1.8.3 Expansion and Contraction

Multiple wires shall be bundled and taped together at 20-foot intervals with 12-inch loop for expansion and contraction.

3.1.8.4 Splices

Electrical splices shall be waterproof.

3.1.9 Automatic Controller

Exact field location of controllers shall be determined before installation. Coordinate the electrical service to these locations. Install in accordance with manufacturer's recommendations and NFPA 70.

3.1.10 Thrust Blocks

Concrete shall be placed so that sides subject to thrust or load are against undisturbed earth, and valves and fittings are serviceable after concrete has set. Thrust blocks shall be as specified in section 02510 WATER DISTRIBUTION SYSTEM.

3.1.11 Backfill

3.1.11.1 Minimum Cover

Depth of cover shall be 12 inches for 1-1/4-inch pipe or smaller; 24

inches for 1-1/2- to 2-inch pipe; 24 inches for 2 1/2-inch pipe or larger; 36 inches for pipes under traffic loads; and 18 inches for low-voltage wires. Remainder of trench or pipe cover shall be filled to within 3 inches of top with excavated soil, and compact soil with plate hand-held compactors to same density as undisturbed adjacent soil.

3.1.11.2 Restoration

Top 3 inches shall be filled with topsoil and compacted with same density as surrounding soil. Lawns and plants shall be restored in accordance with Section 02921 SEEDING, 02922 SODDING, and 02930 EXTERIOR PLANTING. Pavements shall be restored in accordance with Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS.

3.1.12 Adjustment

After grading, seeding, and rolling of planted areas, sprinkler heads shall be adjusted flush with finished grade. Adjustments shall be made by providing new nipples of proper length or by use of heads having an approved device, integral with head, which will permit adjustment in height of head without changing piping.

3.1.13 Disinfection

Sprinkler system fed from a potable water system shall be disinfected upstream of backflow preventer in accordance with Section 02510 WATER DISTRIBUTION SYSTEM.

3.1.14 Cleaning of Piping

Prior to the hydrostatic and operation tests, the interior of the pipe shall be flushed with clean water until pipe is free of all foreign materials. Flushing and cleaning out of system pipe, valves, and components shall not be considered completed until witnessed and accepted by Contracting Officer.

3.2 FIELD TESTS

All instruments, equipment, facilities, and labor required to conduct the tests shall be provided by Contractor.

3.2.1 Hydrostatic Pressure Test

Piping shall be tested hydrostatically before backfiling and proved tight at a hydrostatic pressure of 150 psi without pumping for a period of one hour with an allowable pressure drop of 5 psi. If hydrostatic pressure cannot be held for a minimum of 4 hours, Contractor shall make adjustments or replacements and the tests repeated until satisfactory results are achieved and accepted by the Contracting Officer.

3.2.2 Leakage Tests

Leakage tests for service main shall be in accordance with Section 02510 WATER DISTRIBUTION SYSTEM.

3.2.3 Operation Test

At conclusion of pressure test, sprinkler heads or emitter heads, quick coupling assemblies, and hose valves shall be installed and entire

system tested for operation under normal operating pressure. Operation test consists of the system operating through at least one complete programmed cycle for all areas to be sprinkled.

3.3 FRAMED INSTRUCTIONS

Framed instructions containing wiring and control diagrams under glass or in laminated plastic shall be posted where directed. Condensed operating instructions, prepared in typed form, shall be framed as specified above and posted beside the diagrams. The framed instructions shall be posted before acceptance testing of the system. After as-built drawings are approved by Contracting Officer, controller charts and programming schedule shall be prepared. One chart for each controller shall be supplied. Chart shall be a reduced drawing of actual as-built system that will fit the maximum dimensions inside controller housing. Black line print for chart and a different pastel or transparent color shall indicate each station area of coverage. After chart is completed and approved for final acceptance, chart shall be sealed between two 20-mil pieces of clear plastic.

3.4 FIELD TRAINING

A field training course shall be provided for designated operating and maintenance staff members. Training shall be provided for a total period of 4 hours of normal working time and shall start after the system is functionally complete but prior to final acceptance tests. Field training shall cover all of the items contained in the operating and maintenance manuals.

3.5 SPARE PARTS

Provide spare parts data and listing in accordance with Part 1 paragraph SUBMITTALS.

3.6 CLEANUP

Upon completion of installation of system, all debris and surplus materials resulting from the work shall be removed.

-- End of Section --

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02/02

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SECTION 02821

FENCING
02/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A 153	(2001) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 392	(1996) Zinc-Coated Steel Chain-Link Fence Fabric
ASTM A 780	(2000) Repair of Damaged and Uncoated Areas of Hot-Dipped Galvanized Coatings
ASTM C 94	(2000e2) Ready-Mixed Concrete
ASTM F 1043	(2000) Strength and Protective Coatings on Metal Industrial Chain-Link Fence Framework
ASTM F 1083	(1997) Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
ASTM F 1184	(1994) Industrial and Commercial Horizontal Slide Gates
ASTM F 626	(1996a) Fence Fittings
ASTM F 668	(1999a) Poly(Vinyl Chloride) (PVC)-Coated Steel Chain-Link Fence Fabric
ASTM F 900	(1994) Industrial and Commercial Swing Gates

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-07 Certificates

Chain Link Fence.

Statement, signed by an official authorized to certify on behalf of the manufacturer, attesting that the chain link fence and component materials meet the specified requirements.

1.3 APPROVAL OF POLYVINYL CHLORIDE-COATED FENCE MATERIALS

Polyvinyl chloride-coated fence materials shall be throughly inspected for cracking, peeling, and conformance with the specifications by the Contracting Officer's Representative prior to installation. Any fence materials rejected by the Contracting Officer's Representative shall be replaced by the contractor with approved materials at no additional cost to the Government.

PART 2 PRODUCTS

2.1 FENCE FABRIC

Fence fabric shall conform to the following:

2.1.1 Chain Link Fence Fabric

ASTM A 392, Class 2b polyvinyl chloride-coated steel fabric with 0.3 ounces of zinc coating per square foot in accordance with ASTM F 668. Fabric shall be fabricated of 9 gauge wire woven in 2 inch mesh. Polyvinyl chloride coating for fabric and all other fence components shall be manufacturer's standard dark green in color. Fabric height shall be 5 feet. Fabric shall be twisted and barbed on the top selvage and knuckled on the bottom selvage.

2.2 GATES

ASTM F 900 and/or ASTM F 1184. Gate shall be the type and swing shown. Gate frames shall conform to strength and coating requirements of ASTM F 1083 for Group IA, steel pipe, with external coating Type A, nominal pipe size (NPS) 1-1/2. Gate frames shall conform to strength and coating requirements of ASTM F 1043, for Group IC, steel pipe with external coating Type A or Type B, nominal pipe size (NPS) 1-1/2. Gate frames shall be polyvinyl chloride-coated steel pipe (Group IA) with external coating Type A, a nominal pipe size ()NPS) 1-1/2, conforming to ASTM F 1043. Gate fabric shall be as specified for chain link fabric. Gate leaves more than 8 feet wide shall have either intermediate members and diagonal truss rods or shall have tubular members as necessary to provide rigid construction, free from sag or twist. Gate leaves less than 8 feet wide shall have truss rods or intermediate braces. Gate fabric shall be attached to the gate frame by method standard with the manufacturer except that welding will not be permitted. Latches, hinges, stops, keepers, rollers, and other hardware items shall be furnished as required for the operation of the gate. Latches shall be arranged for padlocking so that the padlock will be accessible from both sides of the gate. Stops shall be provided for holding the gates in the open position.

2.3 POSTS

2.3.1 Metal Posts for Chain Link Fence

ASTM F 1083, zinc-coated. Post shall be either Group IA steel pipe, Group IC, Group II, roll-formed steel sections, or Group III steel H-sections and shall be zinc coated (Type A) and polyvinyl chloride coated conforming to the requirements of ASTM F 1043. Sizes shall be as shown on the drawings.

Line posts and terminal (corner, gate, and pull) posts selected shall be of the same designation throughout the fence. Gate post shall be for the gate type specified subject to the limitation specified in ASTM F 900 and/or ASTM F 1184.

2.4 BRACES AND RAILS

ASTM F 1083, zinc-coated. Braces and rails shall be Group IA, steel pipe, size NPS 1-1/4 or Group II,formed steel sections, size 1-21/32 inch and shall be zinc coated (Type A) and polyvinyl chloride-coated conforming to the requirements of ASTM F 1043. Group II, formed steel sections, size 1-21/32 inch, conforming to ASTM F 1043, may be used as braces and rails if Group II line posts are furnished.

2.5 ACCESSORIES

ASTM F 626. Ferrous accessories shall be zinc or aluminum coated. Ferrous accessories shall also be polyvinyl chloride-coated, minimum thickness of 0.006 inch, maximum thickness of 0.015 inch. Color coating of fittings shall match the color coating of the fabric. Truss rods shall be furnished for each terminal post. Truss rods shall be provided with turnbuckles or other equivalent provisions for adjustment. Tie wire for attaching fabric to rails, braces, and posts shall be 9 gauge steel wire and match the coating of the fence fabric. Miscellaneous hardware coatings shall conform to ASTM A 153 unless modified. Threaded hardware shall be painted to match polyvinyl chloride coatings.

2.6 CONCRETE

ASTM C 94, using 3/4 inch maximum size aggregate, and having minimum compressive strength of 3000 psi at 28 days. Grout shall consist of one part portland cement to three parts clean, well-graded sand and the minimum amount of water to produce a workable mix.

2.7 PRAIRIE DOG PREVENTION FENCING

Provide fabric material specially designed to prevent prairie dog intrusion, covering the lower one foot of the fence exterior.

PART 3 EXECUTION

3.1 INSTALLATION

Fence shall be installed to the lines and grades indicated. The area on either side of the fence line shall be cleared to the extent indicated. Line posts shall be spaced equidistant at intervals not exceeding 10 feet. Terminal (corner, gate, and pull) posts shall be set at abrupt changes in vertical and horizontal alignment. Fabric shall be continuous between terminal posts; however, runs between terminal posts shall not exceed 500 feet. Any damage to galvanized surfaces, including welding, shall be repaired with paint containing zinc dust in accordance with ASTM A 780. No burrs, sharp wire ends, post caps, bolts, screws, or other sharp objects shall remain after completion of the fence.

3.2 EXCAVATION

Post holes shall be cleared of loose material. Waste material shall be spread where directed. The ground surface irregularities along the fence line shall be eliminated to the extent necessary to maintain a 1 inch

clearance between the bottom of the fabric and finish grade.

3.3 POST INSTALLATION

3.3.1 Posts for Chain Link Fence

Posts shall be set plumb and in alignment. Posts shall be set in concrete to the depth indicated on the drawings. Posts set in concrete shall be set in holes not less than the diameter shown on the drawings. Concrete and grout shall be thoroughly consolidated around each post, shall be free of voids and finished to form a dome. Concrete and grout shall be allowed to cure for 72 hours prior to attachment of any item to the posts.

3.4 RAILS

3.4.1 Top Rail

Top rail shall be supported at each post to form a continuous brace between terminal posts. Where required, sections of top rail shall be joined using sleeves or couplings that will allow expansion or contraction of the rail.

3.4.2 Bottom Rail

The bottom rail shall be bolted to double rail ends and double rail ends shall be securely fastened to the posts. Bolts shall be peened to prevent easy removal. Bottom rail shall be installed before chain link fabric.

3.5 BRACES AND TRUSS RODS

Braces and truss rods shall be installed as indicated and in conformance with the standard practice for the fence furnished. Horizontal (compression) braces and diagonal truss (tension) rods shall be installed on fences over 6 feet in height. A center brace or 2 diagonal truss rods shall be installed on 12 foot fences. Braces and truss rods shall extend from terminal posts to line posts. Diagonal braces shall form an angle of approximately 40 to 50 degrees with the horizontal. No bracing is required on fences 6 feet high or less if a top rail is installed.

3.6 CHAIN LINK FABRIC

Chain link fabric shall be installed on the side of the post indicated. Fabric shall be attached to terminal posts with stretcher bars and tension bands. Bands shall be spaced at approximately 15 inch intervals. The fabric shall be installed and pulled taut to provide a smooth and uniform appearance free from sag, without permanently distorting the fabric diamond or reducing the fabric height. Fabric shall be fastened to line posts at approximately 15 inch intervals and fastened to all rails at approximately 24 inch intervals. Fabric shall be cut by untwisting and removing pickets. Splicing shall be accomplished by weaving a single picket into the ends of the rolls to be joined. The bottom of the installed fabric shall be 1 plus or minus 1/2 inch above the ground.

3.7 GATE INSTALLATION

Gates shall be installed at the locations shown. Hinged gates shall be mounted to swing as indicated. Latches, stops, and keepers shall be installed as required with latches a minimum of 60 inches above grade and only operable from inside the fence. Hinge pins, and hardware shall be welded or otherwise secured to prevent removal.

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SECTION 02840

ACTIVE VEHICLE BARRIERS
08/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO HB-17	(2002) Standard Specifications for Highway Bridges

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1	(2002) Structural Welding Code - Steel

ASTM INTERNATIONAL (ASTM)

ASTM A 106	(2002a) Seamless Carbon Steel Pipe for High-Temperature Service
ASTM D 3034	(2000) Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA 250	(1997) Enclosures for Electrical Equipment (1000 Volts Maximum)

SOCIETY OF AUTOMOTIVE ENGINEERS INTERNATIONAL (SAE)

SAE J517	(2003) Hydraulic Hose

UNDERWRITERS LABORATORIES (UL)

UL 486A	(1997; Rev thru May 2001) Wire Connectors and Soldering Lugs for Use with Copper Conductors

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Installation; G-AO.
Equipment; G-AO.
Electrical Work; G-AO.

Detail drawings containing complete wiring and schematic diagrams, and any other details required to demonstrate that the system has been coordinated and will properly function as a unit. Drawings shall show proposed layout and anchorage of equipment and appurtenances, and equipment relationship to other parts of the work including foundation and clearances for maintenance and operation. Detail drawings shall include a copy of the Department of State certificate of barrier performance.

SD-03 Product Data

Vehicle Barriers.

A complete list of equipment, materials, including industrial standards used and how they apply to the applicable component and manufacturer's descriptive data and technical literature, catalog cuts, and installation instructions. Information necessary to document a minimum 1-year successful field operation performance history for each type of vehicle barrier installed.

Spare Parts.

Spare parts data for each different item of material and equipment used, after approval of the detail drawings. The data shall include a complete list of parts and supplies, with current unit prices and source of supply.

SD-06 Test Reports

Field Testing.

Test reports in booklet form showing all field tests, including component adjustments and demonstration of compliance with the specified performance criteria, upon completion and testing of the installed system. Each test report shall indicate the final position of controls.

SD-10 Operation and Maintenance Data

Vehicle Barriers; G-AO.
Operating and Maintenance Instructions; G-AO.

Data Package 4 in accordance with Section 01781 OPERATION AND MAINTENANCE DATA.

Six copies of operation and maintenance manuals, a minimum of 2 weeks prior to field training. One complete set prior to performance testing and the remainder upon acceptance. Manuals shall be approved prior to acceptance. Operation manuals shall outline the step-by-step procedures required for system startup, operation, and shutdown. The manuals shall include the manufacturer's name, model number, service manual, parts list, and brief description of all equipment and their basic operating features. Maintenance manuals shall include routine maintenance procedures, possible breakdowns and repairs, and troubleshooting

guide. The manuals shall include piping layout, equipment layout, and simplified wiring and control diagrams of the system as installed. The manuals shall also include synthetic biodegradable hydraulic oil types to be used for ambient temperature ranges of minus 30 degrees F to 150 degrees F to cover winter operation, summer operation, and ambient temperature ranges in between.

1.3 GENERAL REQUIREMENTS

Vehicle Barriers furnished shall in all respects be identical to the unit tested and certified. Crash test shall be performed and data compiled by an approved independent testing agency. Test vehicle shall not vault or penetrate the barrier during the test. The design and structural materials of the vehicle barrier furnished shall be the same as those used in the crash tested barrier.

1.4 NAMEPLATES

Nameplate data shall be permanently attached to each vehicle barrier. The data shall be legibly marked on corrosion-resistant metal plates and shall consist of at least the following:

a. Manufacturer's name.

b. Model number.

c. Serial number.

d. Date of manufacture.

1.5 DELIVERY AND STORAGE

Components placed in storage shall be protected from the weather, humidity, and temperature variation, dirt and dust, or other contaminants. Structural materials shall be stored on sleepers or pallets and shall be protected from rust and objectionable materials such as dirt, grease, or oil.

1.6 SPARE PARTS

A manufacturer's standard recommended spare parts package, with current unit prices and source of supply complete with detailed manuals on parts replacement, shall be provided with each barrier to facilitate 1 year of normal operation. Particular consideration shall be given to system components which are not readily available from local or commercial sources and which are critical to the operation of the system.

PART 2 PRODUCTS

2.1 RETRACTABLE BOLLARDS

The total bollard height when in the raised position shall be no less than 30 inches above the roadway surface and shall have an outside diameter of no less than 8 inches. A bollard system shall consist of a minimum of 3 bollards spaced no more than 36 inches from centerline to centerline of bollards across a 10 foot roadway. Bollards in the lowered position shall be capable of supporting a 16,000 pound wheel load each. Design for this load shall be in accordance with AASHTO HB-17. Retractable bollards shall withstand a 15,000 pound vehicle at impact speed of 30 mph with maximum

bollard deflection or vehicle penetration of 3 feet.

2.1.1 Powered Retractable Bollards

The retractable bollard shall be capable of 60 complete up/down cycles per hour. Bollards shall be capable of being raised or lowered within a 3 to 15-second range during normal use and within 2.5 seconds for emergency operations.

2.1.1.1 Failure Modes of Operation

The system shall be designed to prevent lowering of the barrier in the event of hydraulic, electrical, or mechanical failure. A manual pump, or other system, shall be included for operation of hydraulic and/or mechanical barriers without power.

2.1.1.2 Electric Motors

Unless otherwise indicated, electric motors shall have totally enclosed enclosures. For multiple barriers being operated from a hydraulic power unit it is highly recommended that the electric motor be 3-phase.

2.1.1.3 System

The system shall be designed to maintain the barriers in the raised position, without inspection, for period of time of up to 1 week. If a hydraulic system is used, it shall be equipped with pressure relief valves to prevent overpressure.

2.1.1.4 Hydraulic Power Unit

The hydraulic power unit shall contain synthetic biodegradable hydraulic fluid which maintains its viscosity operating range, even at constant heaviest use rate, for an ambient temperature range of 20 to 150 degrees F. A hydraulic fluid heater shall be provided so that the viscosity remains within its operating range, if ambient temperatures below 20 degrees F are expcted. Buried hydraulic lines for the connection of the hydraulic power unit to the barrier shall be flexible or carbon steel pipe, or a combination of flexible and carbon steel pipe. Flexible and rigid hydraulic line working pressures shall exceed the maximum system relief pressure. PVC pipe and fittings for burial of hydraulic lines shall be in accordance with ASTM D 3034 Type PS 46 with minimum pipe stiffness of 46.

a. Flexible hydraulic lines shall be in accordance with SAE J517.

b. Rigid hydraulic lines shall be seamless carbon steel pipe in accordance with ASTM A 106.

2.1.1.5 Hydraulic Power Unit Enclosure

A NEMA Type 3R enclosure as specified in NEMA 250 shall be provided to enclose the hydraulic power unit. The enclosure shall be designed for easy removal of the hydraulic power unit and other accessories without complete removal of the enclosure. An access door with hinges and an inside and outside operable/lockable (exterior) door latch shall be provided. Equipment within the enclosure shall be placed and configured so that all periodic maintenance can be performed through the access door without removal of the equipment. The enclosure shall be equipped with weatherproof louver vents appropriately sized and located to dissipate

internal heat generation.

2.2 ELECTRICAL WORK

Motors, manual or automatic motor control equipment and protective or signal devices required for the operation specified herein shall be provided in accordance with Section 16415 ELECTRICAL WORK, INTERIOR. All field wiring for loop detectors, communication lines, and power circuits shall have surge protection. Any wiring required for the operation specified herein, but not shown on the electrical plans, shall be provided under this section in accordance with Sections 16415 ELECTRICAL WORK, INTERIOR and 16375 ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND.

2.3 CONTROL PANEL

A control panel and control circuit shall be provided to interface between all barrier control stations and the power unit. The control station is defined as the main control panel as shown. The control circuit shall contain all relays, timers, and other devices or an industrial programmable controller programmed as necessary for the barrier operation. The control panel shall allow direct interface with auxiliary equipment such as card readers, remote switches, loop detectors, infrared sensors, and gate limit switches. Loop controllers shall not cause an automatic barrier raise following power loss or restoration. The enclosure shall be as indicated on the drawings. All device interconnect lines shall be run to terminal strips.

2.3.1 Voltage

The control circuit shall operate from a 120 volt 60 Hz supply. The control circuit voltage shall be 24 dc for all external control panels.

2.3.2 Main Control Panel

A main control panel shall be supplied to control barrier function. This panel shall have a key-lockable main switch with main power "ON" and panel "ON" lights. Buttons to raise and lower each set of barriers shall be provided. Barrier "UP" and "DOWN" indicator lights shall be included for each set of barriers. An emergency fast operate circuit (EFO) shall be operated from a push button larger than the normal controls and have a flip safety cover installed over the push button or toggle switch. The EFO shall also be furnished with an EFO-active light and reset button.

2.4 MISCELLANEOUS EQUIPMENT

2.4.1 Safety Equipment

2.4.1.1 Barrier Systems Sensors

The barrier system sensors shall consist of the following:

a. Suppression Loops - Two inductive loops whose outputs shall be used to prevent barriers raising when a vehicle is within a prescribed distance of the barrier. The output of the loops shall override all barrier rise signals until one second after a vehicle clears the suppression loop.

The sensors shall be compatible with the barrier controller and shall function as part of a complete barrier control system.

2.4.2 Heater

A waterproof barrier heater with a thermostat control and NEMA 4 junction box connection point shall be provided for de-icing and snow melting. The heater shall provide barrier operation to an ambient temperature of minus 40 degrees F. For retractable bollards, a 250-watt heater shall be provided for each bollard.

2.5 FINISH

Surfaces shall be painted in accordance with requirements of Section 09900 PAINTS AND COATINGS. Bollards shall be painted white with 2 inch wide reflective red diagonal stripes.

2.6 CONCRETE

The concrete shall conform to Section 03300 CAST-IN-PLACE CONCRETE.

2.7 WELDING

Welding shall be in accordance with AWS D1.1.

2.8 PAVEMENT

After placement of the vehicle barrier, the pavement sections shall be replaced to match the section and depth of the surrounding pavement. Pavement shall be warped to match the elevations of existing pavement. Positive surface drainage, away from the vehicle barrier, shall be provided by pavement slope.

PART 3 EXECUTION

3.1 INSTALLATION

Installation shall be in accordance with manufacturers instructions and in the presence of a representative of the manufacturer. Manufacturer's representative shall be experienced in the installation, adjustment, and operation of the equipment provided. The representative shall also be present during adjustment and testing of the equipment.

3.2 HYDRAULIC LINES

Buried hydraulic lines shall be placed in polyvinyl chloride (PVC) sleeves. Positive drainage shall be provided from the hydraulic power unit to the barrier for drainage of condensation within the PVC sleeve.

3.3 PIT DRAINAGE

A drain connection shall be provided in each barrier that requires pit/vault type construction. Hookups between the storm drains shall be made.

3.4 ELECTRICAL

All control power wiring requiring compression terminals shall use ring-style terminals. Terminals and compression tools shall conform to UL 486A. Roundhead screws and lockwashers shall be used to provide vibration-resistant connections. Connections between any printed circuit

cards and the chassis shall be made with screw connections or other locking means to prevent shock or vibration separation of the card from its chassis. The electrical power supply breaker for the hydraulic power unit shall be capable of being locked in the power on and power off positions.

3.5 FIELD TESTING

Upon completion of construction, a field test shall be performed for each vehicle barrier. The test shall include raising and lowering the barrier, both electrically and manually, through its complete range of operation. Each vehicle barrier shall then be continuously cycled for not less than 30 minutes to test for heat build-up in the hydraulic system. The Contracting Officer shall be notified at least 7 days prior to the beginning of the field test. The Contractor shall furnish all equipment and make all necessary corrections and adjustments prior to tests witnessed by the Contracting Officer. Any conditions that interfere with the proper operation of the barrier disclosed by the test shall be corrected at no additional cost to the Government. Adjustments and repairs shall be done by the Contractor under the direction of the Contracting Officer. After adjustments are made to assure correct functioning of components, applicable tests shall be completed.

3.6 FIELD TRAINING

A field training course shall be provided for designated operating staff members. Training shall be provided for a total period of not less than 1 hour of normal working time and shall start after the system is functionally complete but prior to final acceptance tests. Field training shall cover all of the items contained in the operating and maintenance instructions.

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SECTION 02882

PLAYGROUND EQUIPMENT
06/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A 123	(2000) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 135	(1997c) Electric-Resistance-Welded Steel Pipe
ASTM A 153	(2000) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 500	(1999) Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A 513	(2000) Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing
ASTM B 26/B 26M	(1999) Aluminum Alloy Sand Castings
ASTM B 108	(1999) Aluminum-Alloy Permanent Mold Castings
ASTM B 117	(1997) Operating Salt Spray (Fog) Apparatus
ASTM B 179	(1996) Aluminum Alloys in Ingot and Molten Forms for Castings from All Casting Processes
ASTM B 221	(2000) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM D 648	(2000) Deflection Temperature of Plastics Under Flexural Load
ASTM D 822	(1996) Conducting Tests on Paint and Related Coatings and Materials Using Filtered Open-Flame Carbon-Arc Exposure Apparatus

ASTM D 1248	(2000) Polyethylene Plastics Molding and Extrusion Materials
ASTM D 1735	(1999) Testing Water Resistance of Coatings Using Water Fog Apparatus
ASTM D 2454	(1995) Determining the Effect of Overbaking on Organic Coatings
ASTM D 2794	(1993; R 1999el) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D 3359	(1997) Measuring Adhesion by Tape Test
ASTM D 3363	(2000) Film Hardness by Pencil Test
ASTM D 6112	(1997) Compressive and Flexural Creep and Creep-Rupture of Plastic Lumber and Shapes
ASTM F 1487	(1998) Standard Consumer Safety Performance Specification for Playground Equipment for Public Use

CONSUMER PRODUCT SAFETY COMMISSION (CPSC)

CPSC Pub No 325	(1994) Handbook for Public Playground Safety

1.2 DEFINITIONS

Age-Appropriate: A term that describes equipment scale to include platform height, fall height and maximum equipment height, that allows safe and successful use by children of a specific chronological age; mental and physical ability; and anthropometric measurement. Maximum equipment height and complexity will not exceed a child's ability in that age group.

Composite Structure: Also "Composite Play Structure; Linked Structure". Two or more play events attached, directly adjacent or functionally linked, to create one integral unit that provides more than one play activity.

Designated Play Surface: Any elevated surface for standing, walking, sitting, or climbing; or a flat surface a minimum 2 inches wide having up to a maximum 30 degree angle from horizontal. In some play events the platform surface will be the same as the designated play surface. However, the terms should not be interchanged as they do not define the same point of measurement per ASTM F 1487.

Maximum Equipment Height: The highest point on the equipment (i.e., roof ridge, top of support pole).

Play Event: A piece of manufactured playground equipment that supports one or more play activities.

Protective Surfacing: Material to be used within the use zone that meets the fall attenuation requirements of Section 02791 PLAYGROUND PROTECTIVE SURFACING.

Suspended Hazard: Cable, wire, rope or similar devices suspended up to a

maximum 7 feet high between play events; or installed up to a maximum 45 degree angle from the ground to the play event.

Tot: A child under 4 years of age in the pre-toddler and toddler age group.

1.3 CHILD SAFETY AND ACCESSIBILITY STANDARDS

1.3.1 Child Safety

Play events shall meet the child safety performance requirements described in CPSC Pub No 325 and ASTM F 1487. The requirements include the following: Head and neck entrapment; sharp points, edges, and protrusions; entanglement; pinch, crush, and shear points; suspended hazards; play event access and egress points; play event use zone perimeter; and design criteria. Since ASTM F 1487 criteria is defined for the minimum user through the maximum user (2 through 12 years of age), the requirements for the pre-toddler age group is not prescribed. This specification and Section 02791 PLAYGROUND PROTECTIVE SURFACING establish the requirements for the pre-toddler age group.

1.3.2 Child Accessibility

The accessibility requirement in accordance with ASTM F 1487 includes the following: When the play event use zone consists of a protective surfacing rated as unaccessible, at least one accessible route shall be provided from the use zone perimeter to the play event. When there is more than one of the same play activity provided, only one shall meet accessibility requirements (i.e., one swing seat). When the access and egress points are not the same for a play event, an accessible route shall be provided to both. The accessible route shall access all accessible play events and elements. The protective surfacing performance requirements shall be in accordance with Section 02791 PLAYGROUND PROTECTIVE SURFACING.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Configuration; G, AE.

Playground layouts shown in the Drawings are schematic but accurately represent the various features to be provided. Prior to commencing work in the playgrounds, the Contractor shall prepare complete dimensioned layout plans (shop drawings) indicating (but not limited to): playground equipment and attachment, synthetic surfacing and details, fall zones, turf areas, sidewalks and sidewalk textures, timber boardwalks, underground utilities, fences and gates, rodent protection, storage sheds and details, shade structures and details, berms and topography, planter boxes and details, and wear pads. Playground layouts shown in the Drawings may be slightly adjusted to accommodate specific manufacturer's fall zone requirements and recommended clearances.

Shop Drawings; G, AE.

Scale drawings defining the revised use zone perimeters and play event layout.

Fall Height; G, AE.

Scale drawings defining the revised depth or type of protective surfacing.

Finished Grade and Underground Utilities; G, AE.

Finished grade, underground utilities, storm-drainage system and irrigation system status; and location of underground utilities and facilities.

SD-03 Product Data

Equipment; G, AE.

Manufacturer's descriptive data; catalog cuts; references; and the latest edition of ASTM F 1487 and CPSC Pub No 325. Manufacturer's specifications, handling and storage requirements, installation procedures, and safety data sheets to include the following: bare or painted metal platform and slide bed orientation from the direct sun; warnings; and child safety performance standards.

Equipment Identification; G, AO.

A list to include part numbers of furnished play event and equipment materials and components.

Delivery, Storage and Handling; G, AO.

Delivery schedule and manufacturer's name.

Manufacturer Qualification; G, AO.

Name of the owner or user; service or preventive maintenance provider; date of the installation; point of contact and telephone number; and address for 10 sites.

Spare Parts; G, AO.

Furnish manufacturer supplied spare parts.

Materials; G, AO.

Assembled play event structural integrity tests; vertical load tests; and the maximum number of users that can be on the play event.

SD-04 Samples

Color; G, AO.

Two color charts displaying the colors and finishes.

SD-06 Test Reports

Recycled Plastic; G, AO.

Individual component and assembled unit structural integrity test; creep tolerance; deflection tolerance; and vertical load test results. The estimated percentage of recovered material content in the material and components. Life-cycle durability.

SD-07 Certificates

Materials; G, AO.

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include composition and tests to which the material has been subjected.

Manufacturer Qualification; G, AO.

Certificate of Insurance AA rated for a minimum one million dollars.

Installer Qualification; G, AO.

The installer's company name and address, and training and experience certification.

Manufacturer's Representative; G, AO.

The individual's name, company name and address, and playground safety training certificate.

Substitution; G, AO.

Technical representative's written approval.

Play Event Modification; G, AO.

Manufacturer's written approval.

Child Safety and Accessibility Evaluation; G, AO.

Record of measurements and findings by the certified playground safety inspector. Verification the installed play events and equipment meet manufacturer's recommendations and paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS.

SD-10 Operation and Maintenance Data

Maintenance Instruction; G, AO.

Two bound copies of the manufacturer's operation and maintenance manuals.

1.5 DELIVERY, STORAGE, AND HANDLING

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery. Equipment shall be delivered, handled, and stored in accordance with the manufacturer's recommendations. The storage area shall be as designated. The materials shall be stored in a dry, covered area until installed.

1.6 EQUIPMENT IDENTIFICATION

Playground equipment shall be identified with attached and durable label stating the age-group that the equipment is designed to accommodate. There shall be permanent WARNING labels and manufacturer's identification labels, ASTM F 1487.

1.7 INSPECTION

Playground equipment shall be inspected upon arrival at the job site for meeting age-appropriate requirements for the age-group that the equipment is designated to accommodate and specified quality in accordance with paragraphs MATERIALS and CONFIGURATION. Prohibited or unacceptable equipment shall be removed from the job site.

1.8 PROHIBITED EQUIPMENT

Equipment that does not meet the Air Force's developmental play program requirements and are prohibited on outdoor play areas include the following: chain balance beams; rotating equipment, such as merry-go-rounds, log rolls, whirls and may poles; fulcrum seesaws (teeter totters); spring rocking equipment intended for standing; animal figure swings; rope swings; multiple occupancy swings; swinging exercise and trapeze bars; swinging platforms; tire climbers; swinging dual exercise rings; roller slides; trampolines; swinging gates or doors; and new or used vehicle tires. Play houses or enclosures made of horizontal posts or bars with space between them. Wood components are expressly prohibited.

1.9 AGE GROUPS

Play areas are designed to provide challenging play activities by age group. Playground equipment shall be designed to be age appropriate for the age group designated to use it. The Air Force age groups are defined as follows:

1.9.1 Child Development Centers (CDC)

The age groups accommodated by the CDC program range from 6 weeks through 8 years of age defined as the following: infant age group (6 weeks through 12 months); pre-toddler age group (12 through 24 months); toddler age group (2 through 3 years of age); pre-school age group (3 through 5 years of age); and school-age age group (5 through 8 years of age). This project accommodates only pre-toddler, toddler, and pre-school ages.

1.10 MANUFACTURER QUALIFICATION

Play events and equipment similar to those furnished shall have been installed in a minimum 10 sites and been in successful service for a minimum 5 year calendar period. The manufacturer shall provide a Certificate of Insurance AA rated for a minimum one million dollars covering both product and general liability.

1.11 INSTALLER QUALIFICATION

The installer shall be certified by the manufacturer for training and experience installing the play events and equipment.

1.12 WARRANTY

Furnished play events and equipment shall have a minimum 1 year calendar period warranty.

1.13 TECHNICAL REPRESENTATIVE

1.13.1 Child Development Centers (CDC)

The technical representative for outdoor play areas at CDC is the installation Child Development Services (CDS) Coordinator. The design of the CDC outdoor play area shall be based on the developmental play program for the age groups accommodated at the CDC. The play area is designed to support the CDC program and to provide a stage set for creative play. Developmental activities are selected which promote the intellectual, social, emotional and physical growth of the children. The developmental play program is developed by the MACOM CDS Director, installation CDS Coordinator and CDC Director. They are responsible for the developmental play program and the selection of play events to meet that program.

1.14 MANUFACTURER'S REPRESENTATIVE

The manufacturer's certified playground safety inspector or the manufacturer's designated certified playground safety representative shall supervise the installation and adjustment of the play events and equipment to verify the installation meets the requirements of the manufacturer, this specification, and paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS.

PART 2 PRODUCTS

2.1 MATERIALS

Materials shall be the standard products of a manufacturer regularly engaged in the manufacture of play event products.

2.1.1 Metal

Metal components shall have factory-drilled holes and be corrosion resistant. The components shall be free of excess weld and spatter. Metallic materials shall conform to Division 5. Components with extra holes not filled by hardware or covered by components shall be rejected.

2.1.1.1 Steel

Steel components shall comply with ASTM A 135, ASTM A 500, or ASTM A 513. Minimum tensile strength shall be 45,000 psi. Minimum yield point shall be 33,000 psi.

2.1.1.2 Aluminum

Extruded aluminum components shall be type 6061-T6, 6062-T6, or 6063-T6, and shall conform to ASTM B 221. Minimum tensile strength of extruded aluminum components shall be 39,000 psi, and the minimum yield shall be

36,500 psi. Cast aluminum alloy shall conform to ASTM B 179, ASTM B 26/B 26M, and ASTM B 108.

2.1.1.3 Chain

Chain shall be a minimum size 4/0 and shall be corrosion resistant zinc plated. Polyvinyl chloride coating shall be as specified.

2.1.1.4 Rope Cable

Rope cable shall be composed of strands of steel cable with a polypropylene or Dacron synthetic covering that is UV stabilized. Cable ends shall be capped to prevent fraying.

2.1.1.5 Hardware

Hardware shall be corrosion resistant and consist of the following: aluminum, stainless steel, brass, zinc plated steel, zinc-chromate plated steel, or galvanized steel, ASTM A 153. When secure the hardware shall require a tool to prevent unauthorized loosening and removal.

2.1.1.6 Rails, Loops, and Hand bars

Rails, loops, and hand bars shall consist of corrosion resistant aluminum, powder-coated steel or galvanized steel. Polyvinyl chloride coating, if provided, shall be as specified.

2.1.1.7 Anchors

Anchors shall be in accordance with manufacturer's recommendations.

2.1.2 Wood

Wood components are not allowed.

2.1.3 Plastic Components

2.1.3.1 Panels

Plastic panels shall be molded of ultraviolet (UV) and color stabilized polyethylene or nylon with a minimum 3/16 inch thickness, ASTM F 1487. Edges shall be a minimum 3/16 inch radius.

2.1.3.2 Window

Plastic windows shall be flat or molded into a bubble shape, and consist of clear polycarbonate plastic a minimum 3/16 inch thick before forming in accordance with ASTM D 1248. Material shall be shatterproof and resistant to crazing, cracking, or fogging.

2.1.4 Recycled Plastic

Recycled plastic shall contain a minimum 85 percent of recycled post-consumer product and shall conform to EPA requirements in accordance with Division 1. Recycled material shall be constructed or manufactured with a maximum 1/4 inch deflection or creep in any member, ASTM D 648 and ASTM D 6112.

2.1.4.1 High Density Polyethylene

The components shall be molded of ultraviolet (UV) and color stabilized polyethylene. The material shall consist of a minimum 75% plastic profile of high-density polyethylene, low-density polyethylene, and polypropylene raw material. The material shall be non-toxic and have no discernible contaminates such as paper, foil, or wood. The material shall contain a maximum 3 percent air voids. The material shall be free of splinters, chips, peels, buckling, and cracks. Material shall be resistant to deformation from solar heat gain. Material shall have factory-drilled holes. Components with extra holes not filled by hardware or covered by other components shall be rejected. The material shall not be painted.

2.1.4.2 Panel

Panels shall be a minimum 1/4 inch thick; exposed edges shall be smoothed, rounded, and free of burrs and points; and the material shall be shatterproof and resistant to fading, cracking, or fogging.

2.1.4.3 Structural Component

Recycled plastic materials will not be used as load bearing structural members.

2.1.4.4 Recycled Plastic Molded As Lumber

For deck or platform construction, the span of the structural support members shall be a maximum 12 inches on center and recycled plastic decking shall connect to a minimum three joists. Material used for decking shall have a non-slip texture surface. The assembly shall deflect a maximum 1/360 of the span of the frame when exposed to a uniform live load of 40 lbs/ft, ASTM D 648. The product shall meet the structural integrity test requirements, ASTM F 1487 and ASTM D 6112.

2.1.5 Coatings

2.1.5.1 Galvanized

Metal components shall be hot-dipped in zinc after fabrication according to ASTM A 123. Tailings and sharp protrusions formed as a result of the hot-dip process shall be removed and edges shall be burnished.

2.1.5.2 Polyester Powder

Powder-coated surfaces shall receive electrostatic zinc coating prior to painting. Powder coating shall be electrostatically applied and shall be oven cured. Polyester powder shall be in accordance with the following: ASTM D 3359 for adhesion; ASTM D 1735 for flexibility; ASTM D 3363 for hardness; ASTM D 2794 for impact; ASTM D 2454 for overbake resistance; ASTM B 117 for salt spray resistance; and ASTM D 822 for weatherability.

2.1.5.3 Polyvinyl Chloride (PVC)

PVC coating shall be primed with a clear acrylic thermosetting solution. The primed parts shall be preheated prior to dipping. The liquid polyvinyl chloride shall be UV stabilized and mold-resistant. The coated parts shall be cured. The coating shall be a minimum 0.08 inch thick within a plus or minus 0.020 inch tolerance. The coating shall have an 85 durometer hardness, ASTM D 3363. The finish shall be slip-resistant.

2.1.5.4 Concrete

Concrete shall conform to Divisions 2 and 3.

2.1.5.5 Precast Concrete

Precast concrete material shall conform to Division 3.

2.1.5.6 Cast-In Place Concrete

Cast-in-place concrete material shall conform to Divisions 2 and 3.

2.1.6 Color

Color shall be as selected from the manufacturer's standard offering.

2.2 EQUIPMENT

2.2.1 Configuration

Play event configuration, platform height, fall height, and maximum equipment height shall be as indicated. When the configuration varies from the play event shown, shop drawings defining the configuration shall be provided to include the following: equipment layout with the use zone perimeter; designated play surface spot elevations; maximum equipment height spot elevations; platform spot elevations; protective barriers; guardrails; bare or painted metal platform and slide bed orientation; and play events in relationship to the playground layout.

2.2.2 Substitution

Substitutions will not be allowed and play events will not be selected without written approval from the technical representative. Manufacturer substitutions which increase the play event platform height or maximum equipment height shall be evaluated. The increased height requires additional protective surfacing in accordance with paragraph FALL HEIGHT.

2.2.3 Platform Height

Platform height is used to define the age group for age appropriate play events and composite structures. To be age appropriate, the platform height shall meet the finished elevations of the age groups in the following paragraphs. For some play events platform height and paragraph FALL HEIGHT are the same.

2.2.3.1 Pre-Toddler Age Group

Platforms designed for children 12 through 24 months of age shall have a finished elevation a maximum 36 inches above the finished elevation of the protective surfacing.

2.2.3.2 Toddler Age Group

Platforms designed for children 2 through 3 years of age shall have a finished elevation a maximum 48 inches above the finished elevation of the protective surfacing.

2.2.3.3 Pre-School Age Group

Platforms designed for children 3 through 5 years of age shall have a finished elevation a maximum 48 inches above the finished elevation of the protective surfacing.

2.2.4 Protective Barrier and Guardrail

Protective barriers and guardrails shall be provided in accordance with paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS. This specification establishes the protective barrier and guardrail requirements for the infant and pre-toddler age group.

2.2.4.1 Protective Barrier

A protective barrier is defined as an enclosing device around an elevated surface that prevents both inadvertent and deliberate attempts to pass through the device. The protective barrier for pre-toddler, toddler, and pre-school age groups shall be provided on elevated surfaces a minimum 30 inches above the protective surfacing. The protective barrier shall completely surround the elevated surface except for the access or egress route.

2.2.4.2 Guardrail

A guardrail is defined as a device around an elevated surface that prevents inadvertent falls from the elevated surface. The guardrail for pre-toddler, toddler, and pre-school age groups shall be provided on elevated surfaces a minimum 20 inches above the protective surfacing. The guardrail shall completely surround the elevated surface except for the access or egress route.

2.2.5 Sand Table

The sand table with a cover shall be provided. The cover shall not be attached to the table. The sand sieve size shall be provided as defined in Section 02791 PLAYGROUND PROTECTIVE SURFACING.

2.2.6 Multiple-Axis (Rotating) Swing

The swivel mechanism shall contain a durable long life bearing to reduce friction and wear. A tire manufactured specifically for a multiple-axis swing shall be provided and shall weigh a maximum 35 lb. The tire shall be composed of rotationally molded, low density elastomer, and internally reinforced with a steel ring. The tire shall have no openings for insects or water. The multiple-axis swing shall not be confused with the multiple occupancy swing as they are not the same.

2.2.7 Single-Axis (To-Fro) Swing

2.2.7.1 General Requirements

The swing seat shall be molded of high quality rubber or polyurethane with an encapsulated steel reinforcement. The swing seat shall be designed to accommodate one user

2.2.7.2 Full Bucket Swing Seat

A full bucket swing seat is designed to accommodate children up to a

maximum 4 years of age; the seat is used by a child with adult assistance. The swing seat shall be constructed of rubber with a tempered steel insert molded inside, shall be double-sided, shall be enclosed by rubber both front and back, and shall include a 360 degree waist enclosure and leg enclosures. Leg enclosures shall be sized to avoid head or neck entrapment. Finish shall be smooth and edges shall be rounded. These swing seats shall not be mixed with other swing seats within a bay.

2.2.8 Roofs

Roofs shall contain no designated play surface.

2.2.9 Sliding Poles

Sliding poles shall be a maximum 1.9 inch diameter and a continuous surface with no protruding welds or joints along the sliding area.

2.2.10 Plastic Slide

The slide shall be molded of UV stabilized polyethylene or nylon with minimum of 3/16 inch wall thickness. The edge shall be a minimum 3/16 inch radius, ASTM D 1248, Type II, Class A, Grade G4.

2.2.11 Play House or Enclosures

The play house shall be provided with a shelf at the window. The play house and enclosures will be designed to provide other than direct outside visibility from a minimum 5 feet to all inside corners.

2.2.12 Storage Sheds

Storage sheds shall be approximately 9 feet wide by 12 feet long and may be either custom-fabricated or pre-manufactured. One of the 12-foot sides shall be open and face the respective playground; an intermediate column is permissible on the open side. Sharp corners, burrs, and other potential hazards are strictly prohibited in like manner to playground equipment. Storage sheds shall have these basic components: 4" reinforced concrete slab, metal or plastic walls, metal or plastic pitched roof, reinforced corners and anchoring to the concrete slab to resist design wind loads of 30 mph and design snow loads of 30 psf. Colors of storage shed surfaces shall be light-brown tone, including roof; interior surfaces may be either off-white or light-brown. Wood products are expressly prohibited. Extend walls completely down to concrete slab and permanently seal to prevent rodent and vermin infestation. Provide one screened vent each wall approximately 4" by 6" in size near the floor level. Adjacent chain link fence shall abut tightly and resultant joint shall comply with finger entrapment guidelines. Rodent protection barrier shall enclose the outermost walls of all storage sheds.

PART 3 EXECUTION

3.1 SITE PREPARATION

3.1.1 Finished Grade and Underground Utilities

The Contractor shall verify that finished grades are as indicated; the smooth grading has been completed in accordance with Division 2; installation of the underground utilities through the area has been completed in accordance with Division 2; installation of the storm-drainage

system through the area has been completed in accordance with Division 2; and the installation of underground sprinklers through the area has been completed in accordance with Division 2. The location of underground utilities and facilities in the area of the operation shall be verified. Damage to underground utilities and facilities shall be repaired at the Contractor's expense.

3.1.2 Layout

The layout of the entire outdoor play area shall be staked before excavation begins to include the following: all play event configuration access and egress points; use zone perimeters; hard surface areas and pathway widths; exterior plant material and planters; walls and fences; and structures. Sufficient space shall be provided between all adjacent play events and individual play events for play activities and circulation. Moving and rotating play events shall be located away from circulation to prevent collisions.

3.1.2.1 Use Zone

The use zone is defined as the area beneath and immediately adjacent to a play structure or equipment that is designated for unrestricted circulation around equipment; and on whose surface it is predicted that a user would land when falling from or exiting the equipment, (paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS). Also, the use zone is associated with the following terms; "Clear Area," and "Fall Zone". The use zone shall be free of hard surfaces, objects or obstacles that a child could run into or fall on top of and be injured. The use zone shall consist of protective surfacing in accordance with the requirements of Section 02791 PLAYGROUND PROTECTIVE SURFACING. Use zone perimeters shall not overlap hard surfaces. The use zone perimeter shall meet or exceed the requirements of paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS. Use zone perimeters shall not overlap except for certain play events as defined in ASTM F 1487.

3.1.2.2 Shop Drawings

When the use zone perimeter and play event configuration conflict with the requirements and paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS, shop drawings defining corrective measures shall be submitted to include the following: Adjustment to the play event with the use zone perimeter; use zone perimeter overlaps; hard surface area and pathway widths; structures; exterior plant material and planters; walls and fences; and bare or painted metal platform and slide bed orientation to the direct sun.

3.1.3 Orientation

Bare or painted metal platforms and slide beds shall be oriented from the direct sun; or shaded to reduce contact burn risk. Play events that require orientation to adjacent play events or to meet visibility requirements shall be properly oriented.

3.1.4 Obstructions Below Ground

When obstructions below ground affect the work, shop drawings showing proposed adjustments shall be submitted for approval.

3.2 INSTALLATION

Play events shall be installed according to the manufacturer's

recommendations and as shown to meet the requirements of paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS.

3.2.1 Play Event Modification

Site modifications of play events affect the coverage provided in paragraph WARRANTY; therefore, play events and equipment shall not be modified without the written approval of the manufacturer.

3.2.2 Plastic Play Events

Plastic and recycled plastic components shall be connected by stainless steel hardware. The hardware shall be countersunk. Recycled plastic molded as lumber or wood-polymer lumber shall be installed in accordance with the manufacturer's recommendations.

3.2.3 Footings

The top elevation of play event footings will be installed at the subbase of the protective surfacing.

3.2.4 Multiple-Axis (Rotating) Swing

The multiple-axis (rotating) swing shall be located away from other play events and circulation. It shall not be attached to a composite structure.

3.2.5 Single-Axis (To-Fro) Swing

The single-axis (to-fro) swing shall be located on the perimeter of the outdoor play area. It shall not be attached to a composite structure.

3.2.6 Slide

The required exit region clear area shall be provided in accordance with ASTM F 1487.

3.2.7 Chain or Rope Ladder, Climber or Net Climber

A chain or rope ladder; climber; net climber; and similar components shall be installed in the vertical position. Angled or arch positions are not accepted.

3.2.8 Composite Structure

The composite structure use zone perimeter shall be composed of the use zone perimeters of the play events that, when joined together, comprise the composite structure.

3.2.9 Fall Height

3.2.9.1 General

The fall height is defined as the vertical distance between the finished elevation of the designated play surface and the finished elevation of the protective surfacing beneath it. For some play events the fall height and paragraph PLATFORM HEIGHT are the same. For some play events the fall height and maximum equipment height are the same. When the furnished play event fall height varies from the play event shown, shop drawings defining the revised depth or type of protective surfacing to meet or exceed the

requirements of Section 02791 PLAYGROUND PROTECTIVE SURFACING shall be provided.

3.2.9.2 Measuring Fall Height

EQUIPMENT	MEASURING FALL HEIGHT
Composite Structure:	For a platform surrounded by protective barriers, measure from the platform finished elevation. For a platform surrounded by guardrails, measure from the guardrail top elevation.
Infant Crawl Area:	A maximum 24 inch height, measured from the crawl wall or barrier finished elevation.
Playhouse, Nonclimbable:	Measure from the designated play surface finished elevation.
Spring Rocking Equipment:	Measure from the seat top elevation.
Stationary Equipment, Climbable:	Measure from the maximum equipment height finished elevation.
Stationary Equipment, Nonclimbable:	Measure from the designated play surface finished elevation.
Swing:	Measure from the bottom of the pivot point.

3.3 RESTORATION AND CLEAN UP

When the operation has been completed, the Contractor shall clean up and protect the site. Existing areas that have been damaged from the operation shall be restored to original condition at the Contractor's expense.

3.3.1 Clean Up

The site and play events shall be cleaned of all materials associated with the operation. Play events and surfaces shall be cleaned of dirt, stains, filings, and other blemishes occurring from shipment and installation. Cleaning methods and agents shall be as recommended by the manufacturer. Required labeling shall be undamaged and visible in accordance with paragraph EQUIPMENT IDENTIFICATION.

3.3.2 Protection

The area shall be protected as required or directed by providing barricades and signage. Signage shall be in accordance with Division 10.

3.3.3 Disposal of Materials

Excess and waste material shall be removed and disposed off Government

property.

3.4 PLAYGROUND ACCEPTANCE

3.4.1 Child Safety and Accessibility Evaluation

When the protective surfacing is installed the play events and protective surfacing shall be thoroughly inspected and measured to verify the playground meets manufacturer's recommendations, paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS, and paragraph FALL HEIGHT. The play events shall be age appropriate for the age group using them in accordance with paragraph PLATFORM HEIGHT. Determine 1) secure anchoring; 2) all hardware and connectors are tight; 3) all hardware and connectors require tools to loosen; 4) all hooks are closed; 5) head and neck entrapment; 6) sharp points, edges, and protrusions; 7) entanglement; 8) pinch, crush, and shear points; 9) suspended hazards; 10) all component holes are filled; and 11) recycled plastic components used as load bearing structural members. Use zone distances shall be measured to determine the area is free of hard surfaces, objects or obstacles. Determine exceptions to use zone overlaps occur in accordance with paragraph USE ZONE. Play event fall height shall be measured and compared to critical height value for thickness of installed protective surfacing. The slide exit region shall have the required clear zone. Play events and surfaces shall be properly oriented. Chain, rope, net climbers or similar components shall be installed in a vertical position. Swing seat clearances shall be measured while occupied by a maximum user for the age group using the equipment. Warning labels and manufacturer identification labels shall be visible in accordance with paragraph EQUIPMENT IDENTIFICATION. Play events that do not comply shall be reinstalled. Fasteners, anchors, hardware and labels that do not comply shall be replaced. Ensure positive drainage for the area and the lowest elevation of protective surfacing subgrade has been provided. A written report describing the results of the evaluation shall be provided.

3.4.2 Spare Parts

Play event and equipment spare parts provided by the manufacturer shall be furnished.

3.4.3 Maintenance Instruction

The manufacturer's operation and maintenance manual describing the recommended preventive maintenance, inspection frequency and techniques, periodic adjustments, lubricants, and cleaning requirements shall be furnished.

3.5 RE-INSTALLATION

When re-installation is required, accomplish the following: Re-install the product as specified. Provide new replacement materials supplied by the manufacturer. Material acquisition of replacement parts is the responsibility of the Contractor. Damage caused by the failed installation shall be repaired at the Contractor's expense.

-- End of Section --

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SECTION 02921

SEEDING
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 4972	(1995a) pH of Soils
ASTM D 5268	(1992; R 1996) Topsoil Used for Landscaping Purposes

U.S. DEPARTMENT OF AGRICULTURE (USDA)

AMS Seed Act	(1995) Federal Seed Act Regulations Part 201

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Equipment.
Surface Erosion Control Material; G, AO.

Manufacturer's literature including physical characteristics, application and installation instructions for equipment, surface erosion control material and chemical treatment material.

A listing of equipment to be used for the seeding operation.

Seed Establishment Period.

Calendar time period for the seed establishment period. When there is more than one seed establishment period, the boundaries of the seeded area covered for each period shall be described.

Maintenance Record.

Maintenance work performed, area repaired or reinstalled, diagnosis for unsatisfactory stand of grass plants.

SD-06 Test Reports

Equipment Calibration.

Certification of calibration tests conducted on the equipment used in the seeding operation.

Soil Test.

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

SD-07 Certificates

Seed; G, AO.

Fertilizer; G, AO.
Organic Material; G, AO.
Soil Conditioner.
Mulch; G, AO.
Asphalt Adhesive; G, AO.

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following:

a. Seed. Classification, botanical name, common name, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.

b. Fertilizer. Chemical analysis and composition percent.

c. Organic Material: Composition and source.

d. Soil Conditioner: Composition and source.

e. Mulch: Composition and source.

f. Asphalt Adhesive: Composition.

1.3 SOURCE INSPECTION

The source of delivered topsoil shall be subject to inspection.

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

1.4.1.1 Delivered Topsoil

Prior to the delivery of any topsoil, its availability shall be verified in paragraph TOPSOIL. A soil test shall be provided for topsoil delivered to

the site.

1.4.1.2 Soil Amendments

Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A chemical analysis shall be provided for bulk deliveries.

1.4.2 Inspection

Seed shall be inspected upon arrival at the job site for conformity to species and quality. Seed that is wet, moldy, or bears a test date five months or older, shall be rejected. Other materials shall be inspected for compliance with specified requirements. The following shall be rejected: open soil amendment containers or wet soil amendments; topsoil that contains slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1-1/2 inch diameter; and topsoil that contains viable plants and plant parts. Unacceptable materials shall be removed from the job site.

1.4.3 Storage

Materials shall be stored in designated areas. Seed, lime, and fertilizer shall be stored in cool, dry locations away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions and not with seeding operation materials.

1.4.4 Handling

Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

1.4.5 Time Limitation

Hydroseeding time limitation for holding seed in the slurry shall be a maximum 24 hours.

PART 2 PRODUCTS

2.1 SEED

2.1.1 Seed Classification

State-certified and State-approved seed of the latest season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with AMS Seed Act and applicable state seed laws.

2.1.2 Permanent Seed Species (Short Grass Prairie)

Short Grass Prairie mixture shall be proportioned by weight as follows:

Scientific Name	Common Name	%of Mixture
Bouteloua gracilis	Blue Grama	30.00
Buchloe dactyloides	Buffalograss	70.00

2.1.3 Permanent Seed Species (Canadian Blue Fescue)

Canadian Blue Fescue mixture shall be proportioned by weight as follows:

Common Name	%of Mixture
Grande Tall Fescue	25%
Pixic Tall Fescue	25%
Ninto Grande Tall Fescue	25%
Coyote Tall Fescue	25%

2.1.4 Quality

Weed seed shall be a maximum 1 percent by weight of the total mixture.

2.1.5 Seed Mixing

The mixing of seed may be done by the seed supplier prior to delivery, or on site as directed.

2.1.6 Substitutions

Substitutions will not be allowed without written request and approval from the Contracting Officer.

2.2 TOPSOIL

Topsoil shall be as defined in ASTM D 5268. When available, the topsoil shall be the existing surface soil stripped and stockpiled onsite in accordance with Section 02300 EARTHWORK. When additional topsoil is required beyond the available topsoil from the stripping operation, topsoil shall be delivered and amended as recommended by the soil test for the seed specified. Topsoil shall be free from slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1-1/2 inch diameter. Topsoil shall be free from viable plants and plant parts.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of pH adjuster, fertilizer, organic material and soil conditioners meeting the following requirements. Vermiculite shall not be used.

2.3.1 Fertilizer

It shall be as recommended by the soil test

2.3.2 Nitrogen Carrier Fertilizer

It shall be as recommended by the soil test

2.3.3 Organic Material

Organic material shall consist of either bonemeal, rotted manure, decomposed wood derivatives, recycled compost, or worm castings.

2.3.3.1 Decomposed Wood Derivatives

Decomposed wood derivatives shall be ground bark, sawdust, yard trimmings, or other wood waste material that is free of stones, sticks, soil, and toxicsubstances harmful to plants and is fully composted or stabilized with nitrogen.

2.4 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region.

2.4.1 Wood Cellulose Fiber

Wood cellulose fiber shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to facilitate placement during application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 4.5 to 6.0.

2.5 WATER

Water shall be the responsibility of the Contractor, unless otherwise noted. Water shall not contain elements toxic to plant life.

2.6 SURFACE EROSION CONTROL MATERIAL

Surface erosion control material shall conform to the following:

2.6.1 Surface Erosion Control Blanket

Blanket shall be machine produced mat of wood excelsior formed from a web of interlocking wood fibers; covered on one side with either knitted straw blanket-like mat construction; covered with biodegradable plastic mesh; or interwoven biodegradable thread, plastic netting, or twisted kraft paper cord netting.

2.6.2 Surface Erosion Control Fabric

Fabric shall be knitted construction of polypropylene yarn with uniform mesh openings 3/4 to 1 inch square with strips of biodegradable paper. Filler paper strips shall have a minimum life of 6 months.

2.6.3 Surface Erosion Control Net

Net shall be heavy, twisted jute mesh, weighing approximately 1.22 pounds per linear yard and 4 feet wide with mesh openings of approximately 1 inch square.

2.6.4 Surface Erosion Control Chemicals

Chemicals shall be high-polymer synthetic resin or cold-water emulsion of selected petroleum resins.

2.6.5 Hydrophilic Colloids

Hydrophilic colloids shall be physiologically harmless to plant and animal life without phytotoxic agents. Colloids shall be naturally occurring, silicate powder based, and shall form a water insoluble membrane after curing. Colloids shall resist mold growth.

2.6.6 Erosion Control Material Anchors

Erosion control anchors shall be as recommended by the manufacturer.

PART 3 EXECUTION

3.1 INSTALLING SEED TIME AND CONDITIONS

3.1.1 Seeding Time

Seed shall be installed from spring thaw to May 30 for spring establishment; and from August 30 to ground freeze for fall establishment.

3.1.2 Seeding Conditions

Seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the seeding operations, proposed alternate times shall be submitted for approval.

3.1.3 Equipment Calibration

Immediately prior to the commencement of seeding operations, calibration tests shall be conducted on the equipment to be used. These tests shall confirm that the equipment is operating within the manufacturer's specifications and will meet the specified criteria. The equipment shall be calibrated a minimum of once every day during the operation. The calibration test results shall be provided within 1 week of testing.

3.1.4 Soil Test

Delivered topsoil, existing soil in smooth graded areas, and stockpiled topsoil shall be tested in accordance with ASTM D 5268 and ASTM D 4972 for determining the particle size, pH, organic matter content, textural class, chemical analysis, soluble salts analysis, and mechanical analysis. Sample collection on site shall be random over the entire site. Sample collection for stockpiled topsoil shall be at different levels in the stockpile. The soil shall be free from debris, noxious weeds, toxic substances, or other materials harmful to plant growth. The test shall determine the quantities and type of soil amendments required to meet local growing conditions for the seed species specified.

3.2 SITE PREPARATION

3.2.1 Finished Grade and Topsoil

The Contractor shall verify that finished grades are as indicated on drawings, and the placing of topsoil, smooth grading, and compaction requirements have been completed in accordance with Section 02300 EARTHWORK, prior to the commencement of the seeding operation.

3.2.2 Application of Soil Amendments

3.2.2.1 Applying Fertilizer

The fertilizer shall be applied as recommended by the soil test. Fertilizer shall be incorporated into the soil to a maximum 4 inch depth or may be incorporated as part of the tillage or hydroseeding operation.

3.2.2.2 Applying Soil Conditioner

The soil conditioner shall be as recommended by the soil test. The soil conditioner shall be spread uniformly over the soil a minimum 1 inch depth and thoroughly incorporated by tillage into the soil to a maximum 4 inch depth.

3.2.2.3 Applying Super Absorbent Polymers

Polymers shall be spread uniformly over the soil as recommended by the manufacturer and thoroughly incorporated by tillage into the soil to a maximum 4 inch depth.

3.2.3 Tillage

Soil on slopes up to a maximum 3-horizontal-to-1-vertical shall be tilled to a minimum 4 inch depth. On slopes between 3-horizontal-to-1-vertical and 1-horizontal-to-1 vertical, the soil shall be tilled to a minimum 2 inch depth by scarifying with heavy rakes, or other method. Rototillers shall be used where soil conditions and length of slope permit. On slopes 1-horizontal-to-1 vertical and steeper, no tillage is required. Drainage patterns shall be maintained as indicated on drawings. Areas compacted by construction operations shall be completely pulverized by tillage. Soil used for repair of surface erosion or grade deficiencies shall conform to topsoil requirements. The fertilizer, and soil conditioner may be applied during this procedure.

3.2.4 Prepared Surface

3.2.4.1 Preparation

The prepared surface shall be a maximum 1 inch below the adjoining grade of any surfaced area. New surfaces shall be blended to existing areas. The prepared surface shall be completed with a light raking to remove debris.

3.2.4.2 Lawn Area Debris

Debris and stones over a minimum 5/8 inch in any dimension shall be removed from the surface.

3.2.4.3 Field Area Debris

Debris and stones over a minimum 3 inch in any dimension shall be removed from the surface.

3.2.4.4 Protection

Areas with the prepared surface shall be protected from compaction or damage by vehicular or pedestrian traffic and surface erosion.

3.3 INSTALLATION

Prior to installing seed, any previously prepared surface compacted or damaged shall be reworked to meet the requirements of paragraph SITE PREPARATION. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.

3.3.1 Installing Seed

Seeding method shall be Drill Seeding. Seeding procedure shall ensure even coverage. Gravity feed applicators, which drop seed directly from a hopper onto the prepared soil, shall not be used because of the difficulty in achieving even coverage, unless otherwise approved. Absorbent polymer powder shall be mixed with the dry seed at the rate recommended by the manufacturer.

3.3.1.1 Drill Seeding

Seed shall be uniformly drilled to a maximum 1/2 inch depth and at the rate of 2 pounds per 1000 square feet for short grass prairie and 4 pounds per 100 square feet for Canadian blue fescue mixture, using a Brillion type seeder drill having drills a maximum 7 inches distance apart. Row markers shall be used with the drill seeder. Half the total rate of seed application shall be drilled in one direction, with the remainder of the seed rate drilled at 90 degrees from the first direction. The drilling equipment shall be maintained with half full seed boxes during the seeding operations.

3.3.1.2 Rolling

The entire area shall be firmed with a roller not exceeding 90 pounds per foot roller width. Slopes over a maximum 3-horizontal-to-1 vertical shall not be rolled. Areas seeded with seed drills equipped with rollers shall not be rolled.

3.3.2 Mulching

3.3.2.1 Non-Asphaltic Tackifier

Hydrophilic colloid shall be applied at the rate recommended by the manufacturer, using hydraulic equipment suitable for thoroughly mixing with water. A uniform mixture shall be applied over the area.

3.3.2.2 Wood Cellulose Fiber, Paper Fiber, and Recycled Paper

Wood cellulose fiber, paper fiber, or recycled paper shall be applied as part of the hydroseeding operation. The mulch shall be mixed and applied in accordance with the manufacturer's recommendations.

3.3.3 Watering Seed

Watering shall be started immediately after completing the seeding of an area. Water shall be applied to supplement rainfall at a rate sufficient to ensure moist soil conditions to a minimum 1 inch depth. Run-off and puddling shall be prevented. Watering trucks shall not be driven over turf areas, unless otherwise directed. Watering of other adjacent areas or plant material shall be prevented.

3.4 SURFACE EROSION CONTROL

3.4.1 Surface Erosion Control Material

Where indicated or as directed, surface erosion control material shall be installed in accordance with manufacturer's instructions. Placement of the material shall be accomplished without damage to installed material or without deviation to finished grade.

3.5 QUANTITY CHECK

For materials provided in bags, the empty bags shall be retained for recording the amount used. For materials provided in bulk, the weight certificates shall be retained as a record of the amount used. The amount of material used shall be compared with the total area covered to determine the rate of application used. Differences between the quantity applied and the quantity specified shall be adjusted as directed.

3.6 RESTORATION AND CLEAN UP

3.6.1 Restoration

Existing turf areas, pavements, and facilities that have been damaged from the seeding operation shall be restored to original condition at Contractor's expense.

3.6.2 Clean Up

Excess and waste material shall be removed from the seeded areas and shall be disposed offsite. Adjacent paved areas shall be cleaned.

3.7 PROTECTION OF INSTALLED AREAS

Immediately upon completion of the seeding operation in an area, the area shall be protected against traffic or other use by erecting barricades and providing signage as required, or as directed.

3.8 SEED ESTABLISHMENT PERIOD

3.8.1 Commencement

The seed establishment period to obtain a healthy stand of grass plants shall begin on the first day of work under this contract and shall continue through the remaining life of the contract and end 4 months after the last day of the seeding operation required by this contract. Written calendar time period shall be furnished for the seed establishment period. When there is more than 1 seed establishment period, the boundaries of the seeded area covered for each period shall be described. The seed establishment period shall be coordinated with Sections 02922 SODDING and 02930 EXTERIOR PLANTING. The seed establishment period shall be modified for inclement weather, shut down periods, or for separate completion dates of areas.

3.8.2 Satisfactory Stand of Grass Plants

Grass plants shall be evaluated for species and health when the grass plants are a minimum 1 inch high.

3.8.2.1 Lawn Area

A satisfactory stand of grass plants from the seeding operation for a lawn area shall be a minimum 100 grass plants per square foot. Bare spots shall be a maximum 6 inches square. The total bare spots shall be a maximum 2 percent of the total seeded area.

3.8.2.2 Field Area

A satisfactory stand of grass plants from the seeding operation for a field area shall be a minimum 100 grass plants per square foot. The total bare spots shall not exceed 2 percent of the total seeded area.

3.8.3 Maintenance During Establishment Period

Maintenance of the seeded areas shall include eradicating weeds, insects and diseases; protecting embankments and ditches from surface erosion; maintaining erosion control materials and mulch; protecting installed areas from traffic; mowing; watering; and post-fertilization.

3.8.3.1 Mowing

a. Lawn Areas: Lawn areas shall be mowed to a minimum 3 inch height when the turf is a maximum 4 inches high. Clippings shall be removed when the amount cut prevents sunlight from reaching the ground surface.

b. Field Areas: Field areas shall be mowed once during the season to a minimum 3 inch height. Clippings shall be removed when the amount cut prevents sunlight from reaching the ground surface.

3.8.3.2 Post-Fertilization

The fertilizer shall be applied as recommended by the soil test. A maximum 1/2 pound per 1000 square feet of actual available nitrogen shall be provided to the grass plants. The application shall be timed prior to the advent of winter dormancy and shall be made without burning the installed grass plants.

3.8.3.3 Repair or Reinstall

Unsatisfactory stand of grass plants and mulch shall be repaired or reinstalled, and eroded areas shall be repaired in accordance with paragraph SITE PREPARATION.

3.8.3.4 Maintenance Record

A record of each site visit shall be furnished, describing the maintenance work performed; areas repaired or reinstalled; and diagnosis for unsatisfactory stand of grass plants.

-- End of Section --

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SECTION 02922

SODDING
07/02

PART 1 GENERAL

1.1 REFERENCES

ASTM INTERNATIONAL (ASTM)

ASTM D 4972	(2001) pH of Soils
ASTM D 5268	(1992; R 1997) Topsoil Used for Landscaping Purposes

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Equipment.
Chemical Treatment Material.

A listing of equipment to be used for the sodding operation. Manufacturer's literature including physical characteristics, application and installation instructions for equipment and chemical treatment material.

Delivery.

Delivery schedule.

Finished Grade and Topsoil.

Finished grade status.

Topsoil.

Availability of topsoil from the stripping and stock piling operation.

Quantity Check.

Bag count or bulk weight measurements of material used compared with area covered to determine the application rate and quantity installed. The quantity of sod used shall be compared against the total area installed.

Sod Establishment Period.

Calendar time period for the sod establishment period. When there is more than one sod establishment period, the boundaries of the sodded area covered for each period shall be described.

Maintenance Record.

Maintenance work performed, area repaired or reinstalled, diagnosis for unsatisfactory stand of grass plants.

Application of Pesticide.

Pesticide treatment plan with sequence of treatment work with dates and times. The pesticide trade name, EPA registration number, chemical composition, formulation, concentration of original and diluted material, application rate of active ingredients, method of application, area treated, amount applied; and the name and state license number of the state certified applicator shall be included.

SD-06 Test Reports

Equipment Calibration.

Certification of calibration tests conducted on the equipment used in the sodding operation.

Soil Test.

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

SD-07 Certificates

Sod.
Topsoil.
Organic Material.
Soil Conditioner.

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following:

a. Sod. Classification, botanical name, common name, mixture percentage of species, percent purity, quality grade, field location and state certification.

b. Topsoil. Particle size, pH, organic matter content, textural class, soluble salts, chemical and mechanical analyses.

c. Fertilizer. Chemical analysis and composition percent.

d. Organic Material: Composition and source.

e. Soil Conditioner: Composition and source.

1.3 SOURCE INSPECTION

The sources of sod material and delivered topsoil shall be subject to inspection.

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

1.4.1.1 Sod

Sod shall be protected during delivery to prevent desiccation, internal heat buildup, or contamination.

1.4.1.2 Delivered Topsoil

Prior to the delivery of any topsoil, its availability shall be verified in paragraph TOPSOIL. A soil test shall be provided for topsoil delivered to the site.

1.4.1.3 Soil Amendments

Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A chemical analysis shall be provided for bulk deliveries.

1.4.2 Inspection

Sod shall be inspected upon arrival at the job site for conformity to species. Sod shall be checked for visible broadleaf weeds, and a visible consistency with no obvious patches of foreign grasses that exceed 2 percent of the canopy. Sod that is heating up, dry, moldy, yellow, irregularly shaped, torn, or of uneven thickness shall be rejected. Other materials shall be inspected for compliance with specified requirements. Open soil amendment containers or wet soil amendments; topsoil that contains slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1-1/2 inch diameter; and topsoil that contains viable plants and plant parts, shall be rejected. Unacceptable materials shall be removed from the job site.

1.4.3 Storage

1.4.3.1 Sod

Sod shall be stored in designated areas and kept in a moist condition by watering with a fine mist, and covered with moist burlap, straw, or other covering. Covering shall allow air to circulate, preventing internal heat from building up. Sod shall be protected from exposure to wind and direct sunlight until installed.

1.4.3.2 Other Material Storage

Materials shall be stored in designated areas. Lime and fertilizer shall be stored in cool, dry locations, away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions

and not with sod operation materials.

1.4.4 Handling

Sod shall not be damaged during handling. Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

1.4.5 Time Limitation

Time limitation between harvesting and installing sod shall be a maximum 36 hours.

PART 2 PRODUCTS

2.1 SOD

2.1.1 Sod Classification

State-certified sod shall be provided as classified by applicable state laws. Sod section shall be sized to permit rolling and lifting without breaking.

2.1.2 Grass Species

Canadian Blue Fescue Sod shall be as follows: Festuca Arundinacea, tall Fescue, of the following cultivars in equal proportion: Grande, Pixie, Ninja Grande, and Coyote.

Kentucky Blue Grass sod shall be as follows: Poa Pratensis with at least 3 cultivars from the following list: Barron, Parade, Glenn, Touchdown, Adelphi, and Bristol.

2.1.3 Quality

Sod shall be relatively free of thatch, diseases, nematodes, soil-borne insects, weeds or undesirable plants, stones larger than 1 inch in diameter, woody plant roots, and other materials detrimental to a healthy stand of grass plants. Broadleaf weeds and patches of foreign grasses shall be a maximum 2 percent of the sod section.

2.1.4 Thickness

Sod shall be machine cut to a minimum 1-3/8 inch thickness. Measurement for thickness shall exclude top growth and thatch.

2.1.5 Anchors

Sod anchors shall be as recommended by the sod supplier.

2.1.6 Substitutions

Substitutions will not be allowed without written request and approval from the Contracting Officer.

2.2 TOPSOIL

Topsoil shall be as defined in ASTM D 5268. When available, the topsoil shall be the existing surface soil stripped and stockpiled onsite in accordance with Section 02300 EARTHWORK. When additional topsoil is

required beyond the available topsoil from stripping operation, topsoil shall be delivered and amended as recommended by the soil test for the sod species specified. Topsoil shall be free from slag, cinders, stones, lumps of soil, sticks, roots, trash, or other material over a maximum 1-1/2 inch diameter. Topsoil shall be free from viable plants and plant parts.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of fertilizer, and soil conditioners meeting the following requirements. Vermiculite shall not be used.

2.3.1 Fertilizer

It shall be as recommended by the soil test. Fertilizer shall be controlled release commercial grade, free flowing, uniform in composition, and consist of a nitrogen-phosphorus-potassium ratio. The fertilizer shall be derived from sulphur coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylenediurea (IBDU). Fertilizer shall be balanced with the inclusion of trace minerals and micro-nutrients.

2.3.2 Nitrogen Carrier Fertilizer

It shall be as recommended by the soil test. Nitrogen carrier fertilizer shall be commercial grade, free flowing, and uniform in composition. The fertilizer may be a liquid nitrogen solution.

2.4 WATER

Water shall be the responsibility of the Contractor unless otherwise noted. Water shall not contain elements toxic to plant life.

PART 3 EXECUTION

3.1 INSTALLING SOD TIME AND CONDITIONS

3.1.1 Sodding Time

Sod shall be installed from late spring to early summer for spring establishment; and to mid August for fall establishment.

3.1.2 Sodding Conditions

Sodding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the sodding operations, proposed alternate times shall be submitted for approval.

3.1.3 Equipment Calibration

Immediately prior to the commencement of sodding operations, calibration tests shall be conducted on the equipment to be used. These tests shall confirm that the equipment is operating within the manufacturer's specifications and will meet the specified criteria. The equipment shall be calibrated a minimum of once every day during the operation. Provide calibration test results within one week of testing.

3.1.4 Soil Test

Delivered topsoil, existing soil in smooth graded areas, and stockpiled topsoil shall be tested in accordance with ASTM D 5268 and ASTM D 4972 for determining the particle size, pH, organic matter content, textural class, chemical analysis, soluble salts analysis, and mechanical analysis. Sample collection on site shall be random over the entire site. Sample collection for stockpiled topsoil shall be at different levels in the stockpile. The soil shall be free from debris, noxious weeds, toxic substances, or other materials harmful to plant growth. The test shall determine the quantities and type of soil amendments required to meet local growing conditions for the sod species specified.

3.2 SITE PREPARATION

3.2.1 Finished Grade and Topsoil

Prior to the commencement of the sodding operation, the Contractor shall verify that finished grades are as indicated on drawings; the placing of topsoil, smooth grading, and compaction requirements have been completed in accordance with Section 02300 EARTHWORK.

3.2.2 Application of Soil Amendments

3.2.2.1 Applying Fertilizer

The fertilizer shall be applied at the rate recommended by the soil test. Fertilizer shall be incorporated into the soil to a maximum 4 inch depth or may be incorporated as part of the tillage or hydroseeding operation.

3.2.3 Tillage

Soil on slopes up to a maximum 3-horizontal-to-1-vertical shall be tilled to a minimum 4 inches deep. On slopes between 3-horizontal-to-1-vertical and 1-horizontal-to-1 vertical, the soil shall be tilled to a minimum 2 inches deep by scarifying with heavy rakes, or other method. Rototillers shall be used where soil conditions and length of slope permit. On slopes 1-horizontal-to-1 vertical and steeper, no tillage is required. Drainage patterns shall be maintained as indicated on drawings. Areas compacted by construction operations shall be completely pulverized by tillage. Soil used for repair of surface erosion or grade deficiencies shall conform to topsoil requirements. The pH adjuster, fertilizer, and soil conditioner may be applied during this procedure.

3.2.4 Prepared Surface

3.2.4.1 Preparation

The prepared surface shall be a maximum 1 inch below the adjoining grade of any surfaced area. New surfaces shall be blended to existing areas. The prepared surface shall be rolled and completed with a light raking to remove from the surface debris and stones over a minimum 5/8 inch in any dimension.

3.2.4.2 Protection

Areas within the prepared surface shall be protected from compaction or damage by vehicular or pedestrian traffic and surface erosion.

3.3 INSTALLATION

Prior to installing sod, any previously prepared surface compacted or damaged shall be reworked to meet the requirements of paragraph SITE PREPARATION. Areas shall be sodded as indicated. Adequate soil moisture shall be ensured prior to sodding by spraying water on the area to be sodded and wetting the soil to a maximum 1 inch depth.

3.3.1 Installing Sod

Rows of sod sections shall be placed parallel to and tightly against each other. Joints shall be staggered laterally. The sod sections shall not be stretched or overlapped. All joints shall be butted tight. Voids and air drying of roots shall be prevented. Sod sections shall be laid across the slope on long slopes. Sod sections shall be laid at right angles to the flow of water in ditches. Sod sections shall be anchored on slopes steeper than 3-horizontal-to-1-vertical. Anchoring may be required when surface weight or pressure upon placed sod sections is anticipated to cause lateral movement. Sod anchors shall be placed a minimum 2 feet on center with a minimum 2 anchors per sod section.

3.3.2 Finishing

Displacement of the sod shall be prevented by tamping or rolling the sod in place and knitting the sod to the soil. Air pockets shall be eliminated and a true and even surface shall be provided. Frayed edges shall be trimmed, and holes or missing corners shall be patched with sod.

3.3.3 Rolling

The entire area shall be firmed with a roller not exceeding 90 pounds per foot roller width. Slopes over a maximum 3-horizontal-to-1 vertical shall not be rolled.

3.3.4 Watering Sod

Watering shall be started immediately after completing each day of installing sod. Water shall be applied at least 3 times per week to supplement rainfall, at a rate sufficient to ensure moist soil conditions to a minimum depth of 1 inch. Run-off, puddling, and wilting shall be prevented. Unless otherwise directed, watering trucks shall not be driven over turf areas. Watering of other adjacent areas or plant material shall be prevented.

3.4 TEMPORARY SEEDING

3.4.1 Soil Amendments, Tillage and Watering

When soil amendments have not been applied to the area, the quantity of 1/2 of the required soil amendments shall be applied and the area tilled in accordance with paragraph SITE PREPARATION. The area shall be watered in accordance with paragraph Watering Sod as required.

3.4.2 Remaining Soil Amendments

The remaining soil amendments shall be applied in accordance with the paragraph Tillage when the surface is prepared for installing sod.

3.5 QUANTITY CHECK

For materials provided in bags, the empty bags shall be retained for recording the amount used. For materials provided in bulk, the weight certificates shall be retained as a record of the amount used. The amount of the material used shall be compared with the total area covered to determine the rate of application. The quantity of sod used shall be compared against the total area established with sod. Differences between the quantity applied and the quantity specified shall be adjusted as directed.

3.6 RESTORATION AND CLEAN UP

3.6.1 Restoration

Existing turf areas, pavements, and facilities that have been damaged from the sodding operation shall be restored to original condition at Contractor's expense.

3.6.2 Clean Up

Excess and waste material shall be removed from the sodded areas and shall be disposed offsite. Adjacent paved areas shall be cleaned.

3.7 PROTECTION OF INSTALLED AREAS

Immediately upon completion of the sodding operation in an area, the area shall be protected against traffic or other use by erecting barricades and providing signage as required, or as directed.

3.8 SOD ESTABLISHMENT PERIOD

3.8.1 Commencement

The sod establishment period to obtain a healthy stand of grass plants shall commence on the first day of sodding work under this contract and shall continue through the remaining life of the contract and end 4 months after the last day of sodding operation required by this contract. Written calendar time period shall be furnished for the sod establishment period. When there is more than 1 sod establishment period, the boundaries of the sodded area covered for each period shall be described. The sod establishment period should be coordinated with Sections 02921 SEEDING, and 02930 EXTERIOR PLANTING. The sod establishment period shall be modified for inclement weather, shut down periods, or for separate completion dates of areas.

3.8.2 Satisfactory Stand of Grass Plants

Grass plants shall be evaluated for species and health. A satisfactory stand of grass plants from the sodding operation shall be living sod uniform in color and leaf texture. Bare spots shall be a maximum 2 inch square. Joints between sod pieces shall be tight and free from weeds and other undesirable growth.

3.8.3 Maintenance During Establishment Period

Maintenance of the sodded areas shall include eradicating weeds, insects and diseases; protecting embankments and ditches from surface erosion; maintaining erosion control materials and mulch; protecting installed areas

from traffic; mowing; watering; and post-fertilization.

3.8.3.1 Mowing

Sodded areas shall be mowed to a minimum 3 inch height when the turf is a maximum 4 inch height. Clippings shall be removed when the amount cut prevents sunlight from reaching the ground surface.

3.8.3.2 Post-Fertilization

The fertilizer shall be applied as recommended by the soil test. A maximum 1/2 pound per 1000 square feet of actual available nitrogen shall be provided to the grass plants. The application shall be timed prior to the advent of winter dormancy and shall be made without burning the installed grass plants.

3.8.3.3 Repair

Unsatisfactory stand of grass plants shall be repaired or reinstalled, and eroded areas shall be repaired in accordance with paragraph SITE PREPARATION.

3.8.3.4 Maintenance Record

A record of each site visit shall be furnished which describes the maintenance work performed; areas repaired or reinstalled; and diagnosis for unsatisfactory stand of grass plants.

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SECTION 02930

EXTERIOR PLANTING
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A300	(1995) Tree Care Operations - Trees, Shrubs and Other Woody Plant Maintenance

AMERICAN NURSERY AND LANDSCAPE ASSOCIATION (ANLA)

ANLA Z60.1	(1996) Nursery Stock

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 4972	(1995a) pH of Soils
ASTM D 5034	(1995) Breaking Strength and Elongation of Textile Fabrics (Grab Test)
ASTM D 5035	(1995) Breaking Force and Elongation of Textile Fabrics (Strip Method)
ASTM D 5268	(1992; R 1996) Topsoil Used for Landscaping Purposes

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Geotextile; G, AO.
Chemical Treatment Material; G, AO.

Manufacturer's literature including physical characteristics, application and installation instructions for geotextile and chemical treatment material.

Delivery.

Delivery schedule.

Maintenance Record.

Maintenance work performed, quantity of plant losses, and replacements; and diagnosis of unhealthy plant material.

SD-06 Test Reports

Soil Test.
Percolation Test.

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

SD-07 Certificates

Plant Material.

Fertilizer.
Organic Material.
Soil Conditioner.
Organic Mulch.
Mycorrhizal Fungi Inoculum.

Prior to delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following.

a. Plant Material: Classification, botanical name, common name, size, quantity by species, and location where grown.

b. Topsoil: Particle size, pH, organic matter content, textural class, soluble salts, chemical and mechanical analyses.

c. Fertilizer: Chemical analysis and composition percent.

d. Organic Material: Composition and source.

e. Soil Conditioner: Composition and source.

f. Organic Mulch: Composition, source, and treatment against fungi growth.

g. Mycorrhizal Fungi Inoculum: Plant material treated.

1.3 SOURCE INSPECTIONS

The nursery or source of plant material and the source of delivered topsoil shall be subject to inspection.

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to

the first day of delivery.

1.4.1.1 Plant Material Identification

Plant material shall be identified with attached, durable, waterproof labels and weather-resistant ink, stating the correct botanical plant name and size.

1.4.1.2 Protection During Delivery

Plant material shall be protected during delivery to prevent desiccation and damage to the branches, trunk, root system, or earth ball. Branches shall be protected by tying-in. Exposed branches shall be covered during transport.

1.4.1.3 Delivered Topsoil

Prior to the delivery of any topsoil, the availability of topsoil shall be verified in paragraph TOPSOIL. A soil test shall be provided for delivered topsoil.

1.4.1.4 Soil Amendments

Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A chemical analysis shall be provided for bulk deliveries.

1.4.2 Inspection

Plant material shall be well shaped, vigorous and healthy with a healthy, well branched root system, free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement or abrasion. Plant material shall be checked for unauthorized substitution and to establish nursery grown status. Plant material showing desiccation, abrasion, sun-scald injury, disfigurement, or unauthorized substitution shall be rejected. The plant material shall exhibit typical form of branch to height ratio; and meet the caliper and height measurements specified. Plant material that measures less than specified, or has been poled, topped off or headed back, shall be rejected. Container-grown plant material shall show new fibrous roots and the root mass shall contain its shape when removed from the container. Plant material with broken or cracked balls; or broken containers shall be rejected. Bare-root plant material that is not dormant or is showing roots were pulled from the ground shall be rejected. Other materials shall be inspected for compliance with paragraph PRODUCTS. Open soil amendment containers or wet soil amendments shall be rejected. Topsoil that contains slag, cinders, stones, lumps of soil, sticks, roots, trash or other material larger than 1-1/2 inch diameter shall be rejected. Topsoil that contains viable plant material and plant parts shall be rejected. Unacceptable material shall be removed from the job site.

1.4.3 Storage

1.4.3.1 Plant Material Storage

Plant material not installed on the day of arrival at the site shall be stored and protected in designated areas. Plant material shall not be stored longer than 30 days. Plant material shall be protected from direct exposure to wind and sun. Bare-root plant material shall be heeled-in.

All plant material shall be kept in a moist condition by watering with a fine mist spray until installed.

1.4.3.2 Other Material Storage

Storage of other material shall be in designated areas. Soil amendments shall be stored in dry locations and away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions and not with planting operation material.

1.4.4 Handling

Plant material shall not be injured in handling. Cracking or breaking the earth ball of balled and burlapped plant material shall be avoided. Plant material shall not be handled by the trunk or stems. Materials shall not be dropped from vehicles.

1.4.5 Time Limitation

Except for container-grown plant material, the time limitation from digging to installing plant material shall be a maximum 90 days. The time limitation between installing the plant material and placing the mulch shall be a maximum 24 hours.

1.5 WARRANTY

Furnished plant material shall have a warranty for plant growth to be in a vigorous growing condition for a minimum 12 month period. A minimum 12 month calendar time period for the warranty of plant growth shall be provided regardless of the contract time period. When plant material is determined to be unhealthy in accordance with paragraph PLANT ESTABLISHMENT PERIOD, it shall be replaced once under this warranty.

PART 2 PRODUCTS

2.1 PLANT MATERIAL

2.1.1 Plant Material Classification

The plant material shall be nursery grown stock conforming to ANLA Z60.1 and shall be the species specified.

2.1.2 Plant Schedule

The plant schedule shall provide botanical names as included in one or more of the publications listed under "Nomenclature" in ANLA Z60.1.

2.1.3 Substitutions

Substitutions will not be permitted without written request and approval from the Contracting Officer.

2.1.4 Quality

Well shaped, well grown, vigorous plant material having healthy and well branched root systems in accordance with ANLA Z60.1 shall be provided. Plant material shall be provided free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement and abrasion. Plant material shall be free of shock or damage to branches, trunk, or root systems, which

may occur from the digging and preparation for shipment, method of shipment, or shipment. Plant quality is determined by the growing conditions; method of shipment to maintain health of the root system; and growth of the trunk and crown as follows.

2.1.5 Growing Conditions

Plant material shall be native to or well-suited to the growing conditions of the project site. Plant material shall be grown under climatic conditions similar to those at the project site.

2.1.6 Method of Shipment to Maintain Health of Root System

2.1.6.1 Balled and Burlapped (BB) Plant Material

Ball size and ratio shall be in accordance with ANLA Z60.1. The ball shall be of a diameter and depth to encompass enough fibrous and feeding root system necessary for the full recovery of the plant. The plant stem or trunk shall be centered in the ball. All roots shall be clean cut at the ball surface. Roots shall not be pulled from the ground. Before shipment the root ball shall be dipped in gels containing mycorrhizal fungi inoculum. The root ball shall be completely wrapped with burlap or other suitable material and securely laced with biodegradable twine.

2.1.6.2 Container-Grown (C) Plant Material

Container size shall be in accordance with ANLA Z60.1. Plant material shall be grown in a container over a duration of time for new fibrous roots to have developed and for the root mass to retain its shape and hold together when removed from the container. Container-grown plant material shall be inoculated with mycorrhizal fungi during germination in the nursery. Before shipment the root system shall be dipped in gels containing mycorrhizal fungi inoculum. The container shall be sufficiently rigid to hold ball shape and protect root mass during shipping.

2.1.7 Growth of Trunk and Crown

2.1.7.1 Deciduous Trees

A height to caliper relationship shall be provided in accordance with ANLA Z60.1. Height of branching shall bear a relationship to the size and species of tree specified and with the crown in good balance with the trunk. The trees shall not be "poled" or the leader removed.

a. Single stem: The trunk shall be reasonably straight and symmetrical with crown and have a persistent main leader.

b. Multi-stem: All countable stems, in aggregate, shall average the size specified. To be considered a stem, there shall be no division of the trunk which branches more than 6 inches from ground level.

c. Specimen: The tree provided shall be well branched and pruned naturally according to the species. The form of growth desired, which may not be in accordance with natural growth habit, shall be as indicated.

2.1.7.2 Deciduous Shrubs

Deciduous shrubs shall have the height and number of primary stems recommended by ANLA Z60.1. Acceptable plant material shall be well shaped, with sufficient well-spaced side branches, and recognized by the trade as typical for the species grown in the region of the project.

2.1.7.3 Coniferous Evergreen Plant Material

Coniferous Evergreen plant material shall have the height-to-spread ratio recommended by ANLA Z60.1. The coniferous evergreen trees shall not be "poled" or the leader removed. Acceptable plant material shall be exceptionally heavy, well shaped and trimmed to form a symmetrical and tightly knit plant. The form of growth desired shall be as indicated.

2.1.7.4 Broadleaf Evergreen Plant Material

Broadleaf evergreen plant material shall have the height-to-spread ratio recommended by ANLA Z60.1. Acceptable plant material shall be well shaped and recognized by the trade as typical for the variety grown in the region of the project.

2.1.7.5 Ground Cover and Vine Plant Material

Ground cover and vine plant material shall have the minimum number of runners and length of runner recommended by ANLA Z60.1. Plant material shall have heavy, well developed and balanced crown with vigorous, well developed root system and shall be furnished in containers.

2.1.8 Plant Material Size

Plant material shall be furnished in sizes indicated. Plant material larger in size than specified may be provided at no additional cost to the Government.

2.1.9 Plant Material Measurement

Plant material measurements shall be in accordance with ANLA Z60.1.

2.2 TOPSOIL

Topsoil shall be as defined in ASTM D 5268. When available, the topsoil shall be the existing surface soil stripped and stockpiled onsite in accordance with Section 02300 EARTHWORK. When additional topsoil is required beyond the available topsoil from the stripping operation, topsoil shall be delivered and amended as recommended by the soil test for the plant material specified. Topsoil shall be free from slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1-1/2 inch diameter. Topsoil shall be free from viable plants and plant parts.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of pH adjuster, fertilizer, organic material and soil conditioners meeting the following requirements. Vermiculite is not recommended.

2.3.1 Fertilizer

It shall be as recommended by the soil test. Fertilizer shall be controlled release commercial grade; free flowing, pellet or tablet form; uniform in composition; and consist of a nitrogen-phosphorus-potassium ratio. The fertilizer shall be derived from sulphur coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylenediurea (IBDU). Fertilizer shall be balanced with the inclusion of trace minerals and micro-nutrients.

2.3.2 Organic Material

Organic material shall consist of either bonemeal, peat, decomposed wood derivatives, recycled compost, or worm castings.

2.3.2.1 Bonemeal

Bonemeal shall be a finely ground, steamed bone product containing from 2 to 4 percent nitrogen and 16 to 40 percent phosphoric acid.

2.3.2.2 Decomposed Wood Derivatives

Decomposed wood derivatives shall be ground bark, sawdust, or other wood waste material free of stones, sticks, and toxic substances harmful to plants, and stabilized with nitrogen.

2.3.2.3 Recycled Compost

Compost shall be a well decomposed, stable, weed free organic matter source. It shall be derived from food, agricultural, or industrial residuals; biosolids (treated sewage sludge); yard trimmings; or source-separated or mixed solid waste. The compost shall possess no objectionable odors and shall not resemble the raw material from which it was derived. The material shall not contain substances toxic to plants. Gradation: The compost material shall pass through a 3/8 inch screen, possess a pH of 5.5 to 8.0, and have a moisture content between 35-55 percent by weight. The material shall not contain more than 1 percent or less by weight of man-made foreign matter. Compost shall be cleaned of plastic materials larger than 2 inches in length. The Contractor shall comply with EPA requirements in accordance with Section 01670 RECYCLED / RECOVERED MATERIALS.

2.3.2.4 Worm Castings

Worm castings shall be screened from worms and food source and shall be commercially packaged.

2.3.3 Soil Conditioner

Soil conditioner shall be sand, super absorbent polymers, calcined clay, or gypsum for single use or in combination to meet topsoil requirements for the plant material specified.

2.3.3.1 Sand

Sand shall be clean and free of toxic materials. Gradation: A minimum 95 percent by weight shall pass a No. 10 sieve and a minimum 10 percent by weight shall pass a No. 16 sieve. Greensand shall be balanced with the inclusion of trace minerals and nutrients.

2.4 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region. Rotted manure is not recommended to be used as a mulch because it would encourage surface rooting of the plant material and weeds.

2.4.1 Inorganic Mulch

When inorganic mulch is required for decorative purposes, it shall be provided in areas designated, and consist of:

a. riverbank stone 3/4 inch

2.4.2 Organic Mulch

2.4.2.1 Shredded Bark

Locally shredded material shall be treated to retard the growth of mold and fungi.

2.4.2.2 Wood Chips and Ground Bark

Locally chipped or ground material shall be treated to retard the growth of mold and fungi. Gradation: A maximum 2 inch wide by 4 inch long.

2.5 GEOTEXTILE

Geotextile shall be woven or nonwoven; polypropylene, polyester, or fiberglass, mat in accordance with ASTM D 5034 or ASTM D 5035. It shall be made specifically for use as a fabric around plant material. Nominal weight shall be a minimum 4 ounces per square yard. Permeability rate shall be a minimum 0.04 inch per second.

2.6 METAL STAKING AND GUYING MATERIAL

Metal shall be aluminum or steel consisting of recycled content made for holding plant material in place.

2.6.1 Bracing Stakes

Metal bracing stakes shall be a minimum 1 inch diameter and a minimum 8 feet long. Stake shall be set without damaging rootball.

2.6.2 Guying Material

Metal guying material shall be a minimum 12 gauge wire. Multi-strand cable shall be woven wire. Guying material tensile strength shall conform to the size of tree to be held firmly in place.

2.6.3 Turnbuckle

Metal turnbuckles shall be galvanized or cadmium-plated steel, and shall be a minimum 3 inches long with closed screw eyes on each end. Screw thread tensile strength shall conform to the size of tree to be held firmly in place.

2.7 PLASTIC STAKING AND GUYING MATERIAL

Plastic shall consist of recycled plastic product made for holding plant material firmly in place. Plastic shall not be used for deadmen.

2.7.1 Chafing Guard

Woven plastic chafing guards shall be used to protect tree trunks and branches when metal is used as guying material. The material shall be the same color throughout the project site. Length shall be a minimum 1.5 times the circumference of the plant trunk at its base.

2.8 FLAG

Plastic flag material shall be used on guying material. It shall be a minimum 6 inches long. Tape color shall be consistent and visually complimentary to the entire project area. The tape color shall meet pedestrian visual safety requirements for day and night.

2.9 MYCORRHIZAL FUNGI INOCULUM

Mycorrhizal fungi inoculum shall be composed of multiple-fungus inoculum as recommended by the manufacturer for the plant material specified.

2.10 WATER

Unless otherwise directed, water shall be the responsibility of the Contractor. Water shall not contain elements toxic to plant life.

2.11 STEEL EDGING

4-inch high by 12-gage steel with corrosion-resistant paint finish and slots for anchor stakes. Provide matching anchor stakes.

2.12 CONCRETE EDGEING

Concrete as specified in Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE of minimum 4,000 psi compressive strength

PART 3 EXECUTION

3.1 INSTALLING PLANT MATERIAL TIME AND CONDITIONS

3.1.1 Deciduous Plant Material Time

Deciduous plant material shall be installed from late spring to mid August.

3.1.2 Evergreen Plant Material Time

Evergreen plant material shall be installed from late spring to mid August.

3.1.3 Plant Material Conditions

Planting operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, frozen ground or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the planting operations, proposed planting times shall be submitted for approval.

3.1.4 Tests

3.1.4.1 Percolation Test

Test for percolation shall be done to determine positive drainage of plant pits and beds. A positive percolation shall consist of a minimum 1 inch per 3 hours; when a negative percolation test occurs, a shop drawing shall be submitted indicating the corrective measures.

3.1.4.2 Soil Test

Delivered topsoil, excavated plant pit soil, and stockpiled topsoil shall be tested in accordance with ASTM D 5268 and ASTM D 4972 for determining the particle size, pH, organic matter content, textural class, chemical analysis, soluble salts analysis, and mechanical analysis. Sample collection onsite shall be random over the entire site. Sample collection for stockpiled topsoil shall be at different levels in the stockpile. The soil shall be free from debris, noxious weeds, toxic substances, or other materials harmful to plant growth. The test shall determine the quantities and type of soil amendments required to meet local growing conditions for the plant material specified.

3.2 SITE PREPARATION

3.2.1 Finished Grade, Topsoil and Underground Utilities

The Contractor shall verify that finished grades are as indicated on drawings, and that the placing of topsoil, the smooth grading, and the compaction requirements have been completed in accordance with Section 02300 EARTHWORK, prior to the commencement of the planting operation. The location of underground utilities and facilities in the area of the planting operation shall be verified. Damage to underground utilities and facilities shall be repaired at the Contractor's expense.

3.2.2 Layout

Plant material locations and bed outlines shall be staked on the project site before any excavation is made. Plant material locations may be adjusted to meet field conditions.

3.2.3 Protecting Existing Vegetation

When there are established lawns in the planting area, the turf shall be covered and/or protected during planting operations. Existing trees, shrubs, and plant beds that are to be preserved shall be barricaded along the dripline to protect them during planting operations.

3.3 EXCAVATION

3.3.1 Obstructions Below Ground

When obstructions below ground affect the work, shop drawings showing proposed adjustments to plant material location, type of plant and planting method shall be submitted for approval.

3.3.2 Plant Pits

Plant pits for ball and burlapped or container plant material shall be dug to a depth equal to the height of the root ball as measured from the base

of the ball to the base of the plant trunk. Plant pits for bare-root plant material shall be dug to a depth equal to the height of the root system. Plant pits shall be dug a minimum 50 percent wider than the ball or root system to allow for root expansion. The pit shall be constructed with sides sloping towards the base as a cone, to encourage well aerated soil to be available to the root system for favorable root growth. Cylindrical pits with vertical sides shall not be used.

3.4 INSTALLATION

3.4.1 Setting Plant Material

Plant material shall be set plumb and held in position until sufficient soil has been firmly placed around root system or ball. In relation to the surrounding grade, the plant material shall be set even with the grade at which it was grown.

3.4.2 Backfill Soil Mixture

The backfill soil mixture may be a mix of topsoil and soil amendments suitable for the plant material specified. When practical, the excavated soil from the plant pit that is not amended provides the best backfill and shall be used.

3.4.3 Adding Mycorrhizal Fungi Inoculum

Mycorrhizal fungi inoculum shall be added as recommended by the manufacturer for the plant material specified.

3.4.4 Backfill Procedure

Prior to backfilling, all metal, wood, synthetic products, or treated burlap devices shall be removed from the ball or root system avoiding damage to the root system. The backfill procedure shall remove air pockets from around the root system. Additional requirements are as follows.

3.4.4.1 Balled and Burlapped Plant Material

Biodegradable burlap and tying material shall be carefully opened and folded back from the top a minimum 1/3 depth from the top of the root ball. Backfill mixture shall be added to the plant pit in 6 inch layers with each layer tamped.

3.4.4.2 Container-Grown and Balled and Potted Plant Material

The plant material shall be carefully removed from containers that are not biodegradeable. Prior to setting the plant in the pit, a maximum 1/4 depth of the root mass, measured from the bottom, shall be spread apart to promote new root growth. For plant material in biodegradable containers the container shall be split prior to setting the plant with container. Backfill mixture shall be added to the plant pit in 6 inch layers with each layer tamped.

3.4.4.3 Earth Berm

An earth berm, consisting of backfill soil mixture, shall be formed with a minimum 4 inch height around the edge of the plant pit to aid in water retention and to provide soil for settling adjustments.

3.4.5 Plant Bed

Plant material shall be set in plant beds according to the drawings. Backfill soil mixture shall be placed on previously scarified subsoil to completely surround the root balls, and shall be brought to a smooth and even surface, blending to existing areas. Earth berms shall be provided. Polymers shall be spread uniformly over the plant bed and in the planting pit as recommended by the manufacturer and thoroughly incorporated into the soil to a maximum 4 inch depth.

3.4.6 Watering

Plant pits and plant beds shall be watered immediately after backfilling, until completely saturated.

3.4.7 Staking and Guying

Staking will be required when trees are unstable or will not remain set due to their size, shape, or exposure to high wind velocity.

3.4.7.1 Three Ground Stakes

Trees over a minimum 8 feet height and less than a maximum 6 inch caliper shall be held firmly in place with 3 bracing or ground stakes spaced equidistantly around the tree. Ground stakes shall be avoided in areas to be mowed. Stakes shall be driven into firm ground outside the earth berm. The guying material shall be firmly anchored at a minimum 1/2 tree height and shall prevent girdling. For trees over maximum 3 inch diameter at breast height, turnbuckles shall be used on the guying material for tree straightening purposes. One turnbuckle shall be centered on each guy line. Chafing guards shall be used when metal is the guying material.

3.4.8 Flags

A flag shall be securely fastened to each guy line equidistant between the tree and the stake, deadmen, or earth anchor. The flag shall be visible to pedestrians.

3.5 FINISHING

3.5.1 Plant Material

Prior to placing mulch, the installed area shall be uniformly edged to provide a clear division line between the planted area and the adjacent turf area, shaped as indicated. The installed area shall be raked and smoothed while maintaining the earth berms.

3.5.2 Placing Geotextile

Prior to placing mulch, geotextile shall be placed as indicated in accordance with the manufacturer's recommendations.

3.5.3 Placing Mulch

The placement of mulch shall occur a maximum 48 hours after planting. Mulch, used to reduce soil water loss, regulate soil temperature and prevent weed growth, shall be spread to cover the installed area with a minimum 4 inch uniform thickness. Mulch shall be kept out of the crowns of shrubs, ground cover, and vines and shall be kept off buildings,

sidewalks and other facilities.

3.5.4 Pruning

Pruning shall be accomplished by trained and experienced personnel. The pruning of trees and palms shall be in accordance with ANSI A300. Only dead or broken material shall be pruned from installed plants. The typical growth habit of individual plant material shall be retained. Clean cuts shall be made flush with the parent trunk. Improper cuts, stubs, dead and broken branches shall be removed. "Headback" cuts at right angles to the line of growth will not be permitted. Trees shall not be poled or the leader removed, nor shall the leader be pruned or "topped off".

3.6 MAINTENANCE DURING PLANTING OPERATION

Installed plant material shall be maintained in a healthy growing condition. Maintenance operations shall begin immediately after each plant is installed to prevent desiccation and shall continue until the plant establishment period commences. Installed areas shall be kept free of weeds, grass, and other undesired vegetation. The maintenance includes maintaining the mulch, watering, and adjusting settling.

3.7 RESTORATION AND CLEAN UP

3.7.1 Restoration

Turf areas, pavements and facilities that have been damaged from the planting operation shall be restored to original condition at the Contractor's expense.

3.7.2 Clean Up

Excess and waste material shall be removed from the installed area and shall be disposed offsite. Adjacent paved areas shall be cleared.

3.8 PLANT ESTABLISHMENT PERIOD

3.8.1 Commencement

The plant establishment period for maintaining exterior plantings in a healthy growing condition shall commence on the first day of exterior planting work under this contract and shall continue through the remaining life of the contract and end 12 months after the last day of exterior planting required by this contract. Written calendar time period shall be furnished for the plant establishment period. When there is more than one plant establishment period, the boundaries of the planted area covered for each period shall be described. The plant establishment period shall be coordinated with Sections 02921 SEEDING; and 02922 SODDING. The plant establishment period shall be modified for inclement weather shut down periods, or for separate completion dates for areas.

3.8.2 Maintenance During Establishment Period

Maintenance of plant material shall include straightening plant material, straightening stakes; tightening guying material; correcting girdling; supplementing mulch; pruning dead or broken branch tips; maintaining plant material labels; watering; eradicating weeds, insects and disease; post-fertilization; and removing and replacing unhealthy plants.

3.8.2.1 Watering Plant Material

The plant material shall be watered as necessary to prevent desiccation and to maintain an adequate supply of moisture within the root zone. An adequate supply of moisture is estimated to be the equivalent of 1 inch absorbed water per week, delivered in the form of rain or augmented by watering. Run-off, puddling and wilting shall be prevented. Unless otherwise directed, watering trucks shall not be driven over turf areas. Watering of other adjacent areas or existing plant material shall be prevented.

3.8.2.2 Weeding

Grass and weeds in the installed areas shall not be allowed to reach a maximum 3 inches height before being completely removed, including the root system.

3.8.2.3 Pesticide Treatment

Treatment for disease or pest shall be in accordance with paragraph APPLICATION OF PESTICIDE.

3.8.2.4 Post-Fertilization

The plant material shall be topdressed at least once during the period of establishment with controlled release fertilizer, reference paragraph SOIL AMENDMENTS. Apply at the rate of 2 pounds per 100 square feet of plant pit or bed area. Dry fertilizer adhering to plants shall be flushed off. The application shall be timed prior to the advent of winter dormancy.

3.8.2.5 Plant Pit Settling

When settling occurs to the backfill soil mixture, additional backfill soil shall be added to the plant pit or plant bed until the backfill level is equal to the surrounding grade. Serious settling that affects the setting of the plant in relation to the maximum depth at which it was grown requires replanting in accordance with paragraph INSTALLATION. The earth berm shall be maintained.

3.8.2.6 Maintenance Record

A record shall be furnished describing the maintenance work performed, the quantity of plant losses, diagnosis of the plant loss, and the quantity of replacements made on each site visit.

3.8.3 Unhealthy Plant Material

A tree shall be considered unhealthy or dead when the main leader has died back, or up to a maximum 25 percent of the crown has died. A shrub shall be considered unhealthy or dead when up to a maximum 25 percent of the plant has died. This condition shall be determined by scraping on a branch an area 1/16 inch square, maximum, to determine if there is a green cambium layer below the bark. The Contractor shall determine the cause for unhealthy plant material and shall provide recommendations for replacement. Unhealthy or dead plant material shall be removed immediately and shall be replaced as soon as seasonal conditions permit.

3.8.4 Replacement Plant Material

Unless otherwise directed, plant material shall be provided for replacement in accordance with paragraph PLANT MATERIAL. Replacement plant material shall be installed in accordance with paragraph INSTALLATION, and recommendations in paragraph PLANT ESTABLISHMENT PERIOD. Plant material shall be replaced in accordance with paragraph WARRANTY. An extended plant establishment period shall not be required for replacement plant material.

3.8.5 Maintenance Instructions

Written instructions shall be furnished containing drawings and other necessary information for year-round care of the installed plant material; including, when and where maintenance should occur, and the procedures for plant material replacement,.

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SECTION 02935

EXTERIOR PLANT MATERIAL MAINTENANCE
01/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A300	(1995) Tree Care Operations - Trees, Shrubs and Other Woody Plant Maintenance

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 4972	(1995a) pH of Soils

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Chemical Treatment Material.

Manufacturer's literature including physical characteristics, application and installation instructions for chemical treatment material.

Work Plan and Schedule; G, AO.
Delivery Schedule.

Contractor's work plan and schedules.

Maintenance Record.

Contractor's record of each site visit.

SD-06 Test Reports

Soil Tests.
Percolation Test.

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and

interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

SD-07 Certificates

pH Adjuster.
Fertilizer.
Mulch.
Pesticide.

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following:

a. pH Adjuster. Calcium carbonate equivalent and sieve analysis.

b. Fertilizer. Chemical analysis and composition percent.

c. Mulch: Composition and source.

d. Pesticide. EPA registration number and registered uses.

1.3 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.3.1 Delivery Schedule

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

1.3.2 Delivery of Pesticides

Pesticide material shall be delivered to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses.

1.3.3 Storage

Materials shall be stored in designated areas. Fertilizer shall be stored in cool, dry locations away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions and not with seeding operation materials.

1.3.4 Handling

Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

PART 2 PRODUCTS

2.1 SOIL AMENDMENTS

Soil amendments shall consist of pH adjuster, fertilizer, organic material and soil conditioners meeting the following requirements. Vermiculite shall not be used.

2.1.1 Fertilizer

Fertilizer shall be controlled release commercial grade, free flowing, uniform in composition, and consist of a nitrogen-phosphorus-potassium ratio. The nutrients ratio shall be as recommended by the soils report. The fertilizer shall be derived from sulfur coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylenediurea (IBDU). Fertilizer shall be balanced with the inclusion of trace minerals and micro-nutrients.

2.1.2 Nitrogen Carrier Fertilizer

Nitrogen carrier fertilizer shall be commercial grade, free flowing, and uniform in composition. The nutrients ratio shall be as recommended by the soils report. The fertilizer may be a liquid nitrogen solution.

2.1.3 Organic Material

Organic material shall consist of bonemeal, rotted manure, decomposed wood derivatives, recycled compost, or worm castings.

2.1.3.1 Bonemeal

Bonemeal shall be finely ground, steamed bone product containing from 2 to 4 percent nitrogen and 16 to 40 percent phosphoric acid.

2.1.3.2 Decomposed Wood Derivatives

Decomposed wood derivatives shall consist of ground bark, sawdust, yard trimmings, or other wood waste material that is free of stones, sticks, soil, and toxic substances harmful to plants, and is fully composted or stabilized with nitrogen.

2.1.3.3 Recycled Compost

Recycled compost shall be well decomposed, stable, weed free organic matter source. Compost shall be derived from food; agricultural or industrial residuals; biosolids (treated sewage sludge); yard trimmings; or source-separated or mixed solid waste. The compost shall possess no objectionable odors and shall not resemble the raw material from which it was derived. The material shall not contain substances toxic to plants. Gradation: The compost material shall pass through a 3/8 inch screen, possess a pH of 5.5 to 8.0, and have a moisture content between 35-55 percent by weight. The material shall not contain more than 1 percent by weight of man-made foreign matter. Compost shall be cleaned of plastic materials larger than 2 inches in length. The Contractor shall comply with EPA requirements in accordance with Section 01670 RECYCLED / RECOVERED MATERIALS.

2.1.3.4 Worm Castings

Worm castings shall be screened from worms and food source, commercially packaged.

2.1.4 Soil Conditioner

Soil conditioner shall be sand, super absorbent polymers, calcined clay, or gypsum for use singly or in combination.

2.1.4.1 Sand

Sand shall be clean and free of toxic materials. Gradation: A minimum 95 percent by weight shall pass a No. 10 sieve and a minimum 10 percent by weight shall pass a No. 16 sieve. Green sand shall be balanced with the inclusion of trace minerals and nutrients.

2.1.4.2 Calcined Clay

Calcined clay shall be granular particles produced from montmorillonite clay calcined to a minimum temperature of 1200 degrees F. Gradation: A minimum 90 percent shall pass a No. 8 sieve; a minimum 99 percent shall be retained on a No. 60 sieve; and a maximum 2 percent shall pass a No. 100 sieve. Bulk density: A maximum 40 pounds per cubic foot.

2.1.4.3 Gypsum

Gypsum shall be commercially packaged, free flowing, and a minimum 95 percent calcium sulfate by volume.

2.2 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region. Rotted manure shall not be used.

2.2.1 Inorganic Mulch

Where inorganic mulch is used for decorative purposes, it shall be replaced or augmented in areas designated. Match existing mulch in size, color, and texture.

a. Riverbank stone 3/4 inch.

2.3 WATER

Water shall be the responsibility of the Contractor. Water shall not contain elements toxic to plant life.

2.4 PESTICIDE

Pesticide shall be an insecticide, herbicide, fungicide, nematocide, rodenticide or miticide. For the purpose of this specification, a soil fumigant shall have the same requirements as a pesticide. The pesticide material shall be EPA registered and approved.

2.5 HERBICIDE

Herbicide shall be EPA registered and approved; furnished for preemergence and postemergence application for crabgrass control and broad leaf weed control and complying with Federal Insecticide, Fungicide, and Rodenticide Act (Title 7 U.S.C. Section 136) for requirements on Contractor's licensing, certification, and record keeping. Contractor shall keep records of all pesticide applications and forward data monthly to Contracting Officer. Record keeping format shall be submitted to Contracting Officer for approval.

PART 3 EXECUTION

3.1 SOIL TESTS

Contractor shall perform soil tests in accordance with ASTM D 4972.

3.2 SITE PREPARATION

3.2.1 Applying Fertilizer

Apply fertilizer at rate of 15 pounds per square yard.

3.3 MULCHING

Mulch shall be mixed and applied in accordance with the manufacturer's recommendations.

3.4 WATERING

Water to supplement rainfall shall be applied at a rate sufficient to ensure plant growth. Run-off and puddling shall be prevented. Watering trucks shall not be driven over turf areas, unless otherwise directed. Watering of other adjacent areas or plant material shall be prevented.

3.5 APPLICATION OF PESTICIDE

When application of a pesticide becomes necessary to remove a pest or disease, a pesticide treatment plan shall be submitted and coordinated with the installation pest management program.

3.5.1 Technical Representative

The certified installation pest management coordinator shall be the technical representative, and shall be present at all meetings concerning treatment measures for pest or disease control.

3.5.2 Application

A state certified applicator shall apply required pesticides in accordance with EPA label restrictions and recommendations. Clothing and personal protective equipment shall be used as specified on the pesticide label. A closed system is recommended to prevent the pesticide from coming into contact with the applicator or other persons. Water for formulating shall only come from designated locations. Filling hoses shall be fitted with a backflow preventer meeting local plumbing codes or standards. Overflow shall be prevented during the filling operation. Prior to each day of use, the equipment used for applying pesticide shall be inspected for leaks, clogging, wear, or damage. Any repairs are to be performed immediately. A pesticide plan shall be submitted.

3.6 GENERAL MAINTENANCE REQUIREMENTS

3.6.1 Fertilization

Fertilizer shall be applied at rate of 10 pounds per square yard. Application shall be timed prior to the advent of winter dormancy and performed without burning plants.

3.6.2 Pesticide Treatment

Pesticide treatment for disease or pest shall be in accordance with paragraph APPLICATION OF PESTICIDE.

3.6.3 Irrigation Maintenance

The Contractor shall service and repair controller, pumps, valves, couplers, sprinklers, sprinkler heads, piping; and shall be responsible for winterization and startup. Sprinkler heads shall direct water away from building. The plant material shall be watered as necessary to prevent desiccation and to maintain an adequate supply of moisture within the root zone; the amount of water required shall be the equivalent of 1 inch absorbed water per week. Amount of irrigation watering shall take amounts of rain into account.

3.6.4 Maintenance Record

A record of each site visit shall be furnished, describing:

a. Maintenance work performed.

b. Areas repaired or reinstalled.

c. Diagnosis for unsatisfactory stand of grass.

d. Diagnosis for unsatisfactory stand of plant material in planting bed.

e. Condition of trees.

f. Condition of shrubs.

g. Quantity and diagnosis of plant loss.

h. Irrigation of system.

3.7 GRASS PLANT QUALITY

Grass plants shall be evaluated for species and health when the grass plants are a minimum 1 inch high. The living grass area shall be maintained to be uniform in color and leaf texture; and free from weeds and other undesirable growth. The living grass area shall be relatively free of thatch, diseases, nematodes, soil-borne insects, weeds or undesirable plants, stones larger than 1 inch in diameter, woody plant roots, and other materials detrimental to a healthy stand of grass plants. Broadleaf weeds and patches of foreign grasses shall be a maximum 2 percent of the total area.

3.7.1 Lawn Area

A satisfactory stand of grass plants for a lawn area shall be a minimum 20 grass plants per square foot. Bare spots shall be a maximum 6 inches square. The total bare spots shall be a maximum 2 percent of the total area.

3.7.2 Field Area

A satisfactory stand of grass plants for a field area shall be a minimum

10 grass plants per square foot. The total bare spots shall not exceed 2 percent of the total seeded area.

3.8 LAWN AND FIELD AREAS MAINTENANCE

3.8.1 Mowing

Lawn and field areas shall be mowed throughout the growing season to meet the requirements of paragraph GRASS PLANT QUALITY. Cutting height shall be adjusted according to type of grass. Frequency of mowing shall be adjusted so that no more than 1/4 of leaf length is removed during a cutting.

3.8.1.1 Lawn Areas

Lawn areas shall be mowed to a minimum 2 inch height in the spring/fall and 2 1/2 inch minimum height in summer when the turf is a maximum 3 1/2 inches high. Remove clippings when the amount cut prevents sunlight from reaching the ground surface.

3.8.2 Turf Trimming

Turf adjoining paved areas, planting beds and trees shall be kept neatly trimmed at all times, essentially after each mowing. String trimmers at trees and shrubs will be prohibited.

3.8.3 Aeration

Turf areas shall be aerated once per year using approved devices. Coring shall be performed by pulling soil plugs to minimum of 4 inches. Soil plugs produced in turf areas shall be left in place.

3.8.4 Herbicide Weed Control

Two or more applications of a pre-emergent herbicide and of a post-emergent herbicide shall be performed to meet the requirements of paragraph GRASS PLANT QUALITY.

3.8.5 Turf Fertilization Program

A regular program of fertilization shall be established to include a spring feeding and early summer feeding to meet the requirements of paragraph GRASS PLANT QUALITY. A total of four pounds of Nitrogen per 1000 square feet shall be applied annually. Additional one pound Nitrogen applications shall be provided as grass color warrants.

3.9 PLANTING BEDS MAINTENANCE

3.9.1 Trimming

Spent flower heads shall be removed. Seasonal succession of bloom requires removal for new plant or trimming back bulb foliage.

3.9.2 Irrigation of Planting Beds

Run-off, puddling and wilting, watering of other adjacent areas or existing plant material shall be prevented.

3.9.3 Weed Control

Grass and weeds in planting beds shall be completely removed before reaching 3 inches in height.

3.10 PLANT MATERIAL QUALITY

3.10.1 General Requirements

Plant material shall be identified as native to the region of the site or as a specimen. Plant material shall be maintained as well shaped, well grown, vigorous plant material having healthy root systems. The plant material shall be maintained as free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement and abrasion. Plant material shall be free of shock or damage to branches, trunk, or root systems. Plant quality is determined by the growing conditions; climate and microclimate of the site for maintaining a healthy root system; and growth of the trunk and crown as follows.

3.10.2 Growth of Trunk and Crown

3.10.2.1 Deciduous Trees

Deciduous tree height to caliper relationship shall be maintained. Height of branching shall bear a relationship to the size and species of the tree and with the crown in good balance with the trunk. The trees shall not be "poled" or the leader removed.

a. Single stem: The trunk shall be reasonably straight and symmetrical with crown and have a persistent main leader.

b. Multi-stem: To be considered a stem, there shall be no division of the trunk which branches more than 6 inches from ground level.

c. Specimen: The tree shall be well branched and pruned naturally according to the species. The form of growth desired, which may not be in accordance with natural growth habit, shall be indicated.

3.10.2.2 Deciduous Shrubs

Deciduous shrub height to number of primary stems shall be maintained. Shrubs shall be maintained as well shaped, with sufficient well-spaced side branches, and recognized by the trade as typical for the species grown in the region of the site.

3.10.2.3 Coniferous Evergreen Plant Material

Coniferous evergreen plant material height-to-spread ratio shall be maintained. The coniferous evergreen trees shall not be "poled" or the leader removed. The plant material shall be maintained to be well shaped and trimmed to form a symmetrical and tightly knit plant. The form of growth desired shall be indicated.

3.10.2.4 Broadleaf Evergreen Plant Material

Broadleaf evergreen plant material height-to-spread ratio shall be maintained. The plant material shall be shaped to be recognized by the trade as typical for the variety grown in the region of the site.

3.10.2.5 Ground Cover and Vine Plant Material

Ground cover and vine plant material shall be maintained to have a heavy, well developed, and balanced crown with vigorous, well developed root system.

3.11 SHRUB AND HEDGE MAINTENANCE

3.11.1 Trimming and Pruning

Trimming shall be performed to ensure the following:

a. Safety.

b. Quality (size, height, and shape).

c. Health (removing broken, diseased branches).

d. Rejuvenation (removing one third to one half of the older stems or branches).

e. Visibility (signs, building entrances, motorist line of sight).

Shrubs shall be pruned to the requirements of paragraph PLANT MATERIAL QUALITY. Pruning shall be accomplished by trained and experienced personnel in accordance with ANSI A300. The typical growth habit of individual plant material or the theme shape of the hedge shall be retained. Clean cuts shall be made flush with the parent trunk. Improper cuts, stubs, dead and broken branches shall be removed.

3.11.2 Irrigation of Shrubs and Hedges

Run-off, puddling and wilting shall be prevented.

3.11.3 Shrub Fertilization Program

A regular program of fertilization shall be established to include a fall feeding to meet the requirements of paragraph PLANT MATERIAL QUALITY. Use industry standards for foliage and root fertilizing the plant material inventoried.

3.12 TREE MAINTENANCE

3.12.1 Trimming and Pruning of Trees

Trimming shall be performed to ensure the following:

a. Safety.

b. Quality (size, height).

c. Health (removing broken, diseased wood branches).

d. Rejuvenation (removing one third to one half of the older stems or branches).

e. Visibility (signs, building entrances, motorist line of sight).

Trees shall be pruned to meet the requirements of paragraph PLANT MATERIAL

QUALITY. Pruning shall be accomplished by trained and experienced personnel in accordance with ANSI A300. The typical growth habit of individual plant material shall be retained. Clean cuts shall be made flush with the parent trunk. Improper cuts, stubs, dead and broken branches shall be removed. "Headback" cuts at right angles to the line of growth will not be permitted. Trees shall not be poled or the leader removed, nor shall the leader be pruned or "topped off".

3.12.2 Irrigation of Trees

Run-off, puddling and wilting shall be prevented.

3.12.3 Tree Fertilization Program

A regular program of fertilization shall be established to include a fall feeding to meet the requirements of paragraph PLANT MATERIAL QUALITY. Use industry standards for foliage and root fertilizing the plant material inventoried.

3.12.4 Unhealthy Plant Material

A tree shall be considered unhealthy or dead when the main leader has died back, or up to a maximum 25 percent of the crown has died. A shrub shall be considered unhealthy or dead when up to a maximum 25 percent of the plant has died. This condition shall be determined by scraping on a branch an area 1/16 inch square, maximum, to determine if there is a green cambium layer below the bark. The Contractor shall determine the cause for unhealthy plant material and shall provide recommendations for replacement. Unhealthy or dead plant material shall be removed immediately.

3.13 RESTORATION AND CLEAN UP

3.13.1 Restoration

Existing turf areas, pavements, and facilities that have been damaged from the maintenance operations shall be restored to original condition at Contractor's expense.

3.13.2 Clean Up

Excess and waste material shall be removed from the maintenance areas and dispose off site. Adjacent paved areas shall be cleaned as determined by the Contracting Officer.

3.14 CLEANING OF PAVED AREAS

Grass, weeds, leaves, and debris from mowing, clipping, and pruning shall be removed immediately. Excess and waste material shall be removed from paved areas and disposed off site. Debris, leaves shall be removed weekly.

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05/98

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SECTION 03100

STRUCTURAL CONCRETE FORMWORK
05/98

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ACI INTERNATIONAL (ACI)

ACI 347R	(1994) Guide to Formwork for Concrete

AMERICAN HARDBOARD ASSOCIATION (AHA)

AHA A135.4	(1995) Basic Hardboard

U.S. DEPARTMENT OF COMMERCE (DOC)

PS1	(1996) Voluntary Product Standard - Construction and Industrial Plywood

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Formwork.

Drawings showing details of formwork, including dimensions of fiber voids, joints, supports, studding and shoring, and sequence of form and shoring removal.

SD-03 Product Data

Design.

Design analysis and calculations for form design and methodology used in the design.

Form Materials.

Manufacturer's data including literature describing form materials, accessories, and form releasing agents.

Form Releasing Agents.

Manufacturer's recommendation on method and rate of application of form releasing agents.

1.3 DESIGN

Formwork shall be designed in accordance with methodology of ACI 347R for anticipated loads, lateral pressures, and stresses. Forms shall be capable of producing a surface which meets the requirements of the class of finish specified in Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE. Forms shall be capable of withstanding the pressures resulting from placement and vibration of concrete.

1.4 STORAGE AND HANDLING

Fiber voids shall be stored above ground level in a dry location. Fiber voids shall be kept dry until installed and overlaid with concrete.

PART 2 PRODUCTS

2.1 FORM MATERIALS

2.1.1 Forms For Class A and Class B Finish

Forms for Class A and Class B finished surfaces shall be plywood panels conforming to PS1, Grade B-B concrete form panels, Class I or II. Other form materials or liners may be used provided the smoothness and appearance of concrete produced will be equivalent to that produced by the plywood concrete form panels. Forms for round columns shall be the prefabricated seamless type.

2.1.2 Forms For Class C Finish

Forms for Class C finished surfaces shall be shiplap lumber; plywood conforming to PS1, Grade B-B concrete form panels, Class I or II; tempered concrete form hardboard conforming to AHA A135.4; other approved concrete form material; or steel, except that steel lining on wood sheathing shall not be used. Forms for round columns may have one vertical seam.

2.1.3 Forms For Class D Finish

Forms for Class D finished surfaces, except where concrete is placed against earth, shall be wood or steel or other approved concrete form material.

2.1.4 Retain-In-Place Metal Forms

Retain-in-place metal forms for concrete slabs and roofs shall be as specified in Section 05310 STEEL DECKS.

2.1.5 Form Ties

Form ties shall be factory-fabricated metal ties, shall be of the removable or internal disconnecting or snap-off type, and shall be of a design that will not permit form deflection and will not spall concrete upon removal. Solid backing shall be provided for each tie. Except where removable tie rods are used, ties shall not leave holes in the concrete surface less than 1/4 inch nor more than 1 inch deep and not more than 1 inchin diameter. Removable tie rods shall be not more than 1-1/2 inches in diameter.

2.1.6 Form Releasing Agents

Form releasing agents shall be commercial formulations that will not bond with, stain or adversely affect concrete surfaces. Agents shall not impair subsequent treatment of concrete surfaces depending upon bond or adhesion nor impede the wetting of surfaces to be cured with water or curing compounds.

2.2 FIBER VOID RETAINERS

2.2.1 Precast Concrete

Precast concrete units shall have a compressive strength of not less than 2500 psi, reinforced with 6 inch by 6 inch by W1.4 WWF wire mesh, and 12 inches (height) by 3 feet (length) by 1-5/8 inches (thickness) in size unless indicated.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Formwork

Forms shall be mortar tight, properly aligned and adequately supported to produce concrete surfaces meeting the surface requirements specified in Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE and conforming to construction tolerance given in TABLE 1. Where concrete surfaces are to have a Class A or Class B finish, joints in form panels shall be arranged as approved. Where forms for continuous surfaces are placed in successive units, the forms shall fit over the completed surface to obtain accurate alignment of the surface and to prevent leakage of mortar. Forms shall not be reused if there is any evidence of surface wear and tear or defects which would impair the quality of the surface. Surfaces of forms to be reused shall be cleaned of mortar from previous concreting and of all other foreign material before reuse. Form ties that are to be completely withdrawn shall be coated with a nonstaining bond breaker.

3.2 CHAMFERING

Except as otherwise shown, external corners that will be exposed shall be chamfered, beveled, or rounded by moldings placed in the forms.

3.3 COATING

Forms for Class A and Class B finished surfaces shall be coated with a form releasing agent before the form or reinforcement is placed in final position. The coating shall be used as recommended in the manufacturer's printed or written instructions. Forms for Class C and D finished surfaces may be wet with water in lieu of coating immediately before placing concrete, except that in cold weather with probable freezing temperatures, coating shall be mandatory. Surplus coating on form surfaces and coating on reinforcing steel and construction joints shall be removed before placing concrete.

3.4 REMOVAL OF FORMS

Forms shall be removed preventing injury to the concrete and ensuring the complete safety of the structure. Formwork for columns, walls, side of

beams and other parts not supporting the weight of concrete may be removed when the concrete has attained sufficient strength to resist damage from the removal operation but not before at least 24 hours has elapsed since concrete placement. Supporting forms and shores shall not be removed from beams, floors and walls until the structural units are strong enough to carry their own weight and any other construction or natural loads. Supporting forms or shores shall not be removed before the concrete strength has reached 70 percent of design strength, as determined by field cured cylinders or other approved methods. This strength shall be demonstrated by job-cured test specimens, and by a structural analysis considering the proposed loads in relation to these test strengths and the strength of forming and shoring system. The job-cured test specimens for form removal purposes shall be provided in numbers as directed and shall be in addition to those required for concrete quality control. The specimens shall be removed from molds at the age of 24 hours and shall receive, insofar as possible, the same curing and protection as the structures they represent.

TABLE 1

TOLERANCES FOR FORMED SURFACES

1. Variations from the plumb:	In any 10 feet of length ---------- 1/4 inch
a. In the lines and surfaces of columns, piers, walls and in arises	Maximum for entire length ---------- 1 inch
b. For exposed corner columns,control-joint grooves, and other conspicuous lines	In any 20 feet of length ---------- ---- 1/4 inch Maximum for entire length---------- 1/2 inch
2. Variation from the level or from the grades indicated on the drawings:	In any 10 feet of length ----------1/4 inch In any bay or in any 20 feet of length---------- 3/8 inch
a. In slab soffits, ceilings, beam soffits, and in arises, measured before removal of supporting shores	Maximum for entire length ---------- 3/4 inch
b. In exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines	In any bay or in any 20 feet of length ---------- ----- 1/4 inch Maximum for entire length---------- 1/2 inch
3. Variation of the linear building lines from established position in plan	In any 20 feet --------- 1/2 inch Maximum ----------1 inch
4. Variation of distance	1/4 inch per 10 feet of distance,

TABLE 1

TOLERANCES FOR FORMED SURFACES

between walls, columns, partitions	but not more than 1/2 inch in any one bay,and not more than 1 inch total variation
5. Variation in the sizes and locations of sleeves, floor openings, and wall opening	Minus ---------- 1/4 inch Plus ---------- 1/2 inch
6. Variation in cross-sectional dimensions of columns and beams and in the thickness of slabs and walls	Minus ---------- 1/4 inch Plus ---------- 1/2 inch
7. Footings:	
a. Variation of dimensions in plan	Minus ---------- 1/2 inch Plus ---------- 2 inches when formed or plus 3 inches when placed against unformed excavation
b. Misplacement of eccentricity	2 percent of the footing width in the direction of misplacement but not more than 2 inches
c. Reduction in thickness of specified thickness	Minus ---------- 5 percent
8. Variation in steps:	Riser ---------- 1/8 inch
a. In a flight of stairs	Tread ---------- 1/4 inch
b. In consecutive steps	Riser ---------- 1/16 inch Tread ---------- 1/8 inch

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SECTION 03150

EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS

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SECTION 03150

EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS
09/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO T 111	(1983; R 2000) Inorganic Matter or Ash in Bituminous Materials

AMERICAN HARDBOARD ASSOCIATION (AHA)

AHA A135.4	(1995) Basic Hardboard

ASTM INTERNATIONAL (ASTM)

ASTM A 1011	(2003a) Steel, Sheet and Stip, Hot-Rolled, Carbon, Structural, High Strength Low-Alloy and High-Strength Low-Alloy With Improved Formability
ASTM A 109	(2003) Steel, Strip, Carbon (0.25 Maximum Percent), Cold-Rolled
ASTM A 167	(1999) Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A 480	(2003b) General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
ASTM B 152	(2000) Copper Sheet, Strip, Plate, and Rolled Bar
ASTM B 370	(1998) Copper Sheet and Strip for Building Construction
ASTM C 919	(2002) Use of Sealants in Acoustical Applications
ASTM C 920	(2002) Elastomeric Joint Sealants
ASTM D 1751	(1999) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

ASTM D 1752	(1984; R 1996e1) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM D 1854	(2002) Jet-Fuel-Resistant Concrete Joint Sealer, Hot-Applied Elastic Type
ASTM D 2628	(1991; R 1998) Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements
ASTM D 2835	(1989; R 1998) Lubricant for Installation of Preformed Compression Seals in Concrete Pavements
ASTM D 4	(1986; R 1998) Bitumen Content
ASTM D 412	(1998a; R 2002e1) Vulcanized Rubber and Thermoplastic Elastomers - Tension
ASTM D 471	(1998e1) Rubber Property - Effect of Liquids
ASTM D 5249	(1995; R 2000) Backer Material for Use with Cold-and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints
ASTM D 5329	(1996) Sealants and Fillers, Hot-Applied, for Joints and Cracks in Asphaltic and Portland Cement Concrete Pavements
ASTM D 6	(1995; R 2000e1) Loss on Heating of Oil and Asphaltic Compounds

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 513	(1974) Specifications for Rubber Waterstops
COE CRD-C 572	(1974) Specifications for Polyvinylchloride Waterstops

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Waterstops.

Shop drawings and fabrication drawings provided by the manufacturer or prepared by the Contractor.

SD-03 Product Data

Preformed Expansion Joint Filler
Sealant
Waterstops

Manufacturer's literature, including safety data sheets, for preformed fillers and the lubricants used in their installation; field-molded sealants and primers (when required by sealant manufacturer); preformed compression seals; and waterstops. Manufacturer's recommended instructions for installing preformed fillers, field-molded sealants; preformed compression seals; and waterstops; and for splicing non-metallic waterstops.

SD-04 Samples

Lubricant for Preformed Compression Seals

Specimens identified to indicate the manufacturer, type of material, size and quantity of material, and shipment or lot represented. Each sample shall be a piece not less than 9 ft of 1 inch nominal width or wider seal or a piece not less than 12 ft of compression seal less than 1 inch nominal width. One quart of lubricant shall be provided.

Field-Molded Type

One gallon of field-molded sealant and one quart of primer (when primer is recommended by the sealant manufacturer) identified to indicate manufacturer, type of material, quantity, and shipment or lot represented.

Non-metallic Materials

Specimens identified to indicate manufacturer, type of material, size, quantity of material, and shipment or lot represented. Each sample shall be a piece not less than 12 inch long cut from each 200 ft of finished waterstop furnished, but not less than a total of 4 ft of each type, size, and lot furnished. One splice sample of each size and type for every 50 splices made in the factory and every 10 splices made at the job site. The splice samples shall be made using straight run pieces with the splice located at the mid-length of the sample and finished as required for the installed waterstop. The total length of each splice shall be not less than 12 inches long.

SD-07 Certificates

Preformed Expansion Joint Filler
Sealant
Waterstops

Certificates of compliance stating that the joint filler and sealant materials and waterstops conform to the requirements specified.

1.3 DELIVERY AND STORAGE

Material delivered and placed in storage shall be stored off the ground and

protected from moisture, dirt, and other contaminants. Sealants shall be delivered in the manufacturer's original unopened containers. Sealants whose shelf life has expired shall be removed from the site.

PART 2 PRODUCTS

2.1 CONTRACTION JOINT STRIPS

Contraction joint strips shall be 1/8 inch thick tempered hardboard conforming to AHA A135.4, Class 1. In lieu of hardboard strips, rigid polyvinylchloride (PVC) or high impact polystyrene (HIPS) insert strips specifically designed to induce controlled cracking in slabs on grade may be used. Such insert strips shall have removable top section.

2.2 PREFORMED EXPANSION JOINT FILLER

Expansion joint filler shall be preformed material conforming to ASTM D 1751 or ASTM D 1752. Unless otherwise indicated, filler material shall be 3/8 inch thick and of a width applicable for the joint formed. Backer material, when required, shall conform to ASTM D 5249.

2.3 SEALANT

Joint sealant shall conform to the following:

2.3.1 Preformed Polychloroprene Elastomeric Type

ASTM D 2628.

2.3.2 Lubricant for Preformed Compression Seals

ASTM D 2835.

2.3.3 Field-Molded Type

ASTM C 920, Type M, Grade P or NS, Class 25, Use NT for horizontal joints. Type M, Grade NS, Class 25, Use NT for vertical joints. Bond breaker material shall be polyethylene tape, coated paper, metal foil or similar type materials. The back-up material shall be compressible, non-shrink, nonreactive with sealant, and non-absorptive material type such as extruded butyl or polychloroprene rubber.

2.3.4 Hot-Applied Jet-Fuel Resistant Type

ASTM D 1854 tested in accordance with ASTM D 5329.

2.4 WATERSTOPS

Intersection and change of direction waterstops shall be shop fabricated.

2.4.1 Flexible Metal

Copper waterstops shall conform to ASTM B 152 and ASTM B 370, O60 soft anneal temper and 20 oz mass per sq ft sheet thickness. Stainless steel waterstops shall conform to ASTM A 167 and ASTM A 480, UNS S30453 (Type 304L), and 20 gauge thick strip.

2.4.2 Rigid Metal

Flat steel waterstops shall conform to ASTM A 109, No. 2 (half hard) temper, No. 2 edge, No. 1 (matte or dull) finish or ASTM A 1011, Grade 40.

2.4.3 Non-Metallic Materials`

Non-metallic waterstops shall be manufactured from a prime virgin resin; reclaimed material is not acceptable. The compound shall contain plasticizers, stabilizers, and other additives to meet specified requirements. Rubber waterstops shall conform to COE CRD-C 513. Polyvinylchloride waterstops shall conform to COE CRD-C 572. Thermoplastic elastomeric rubber waterstops shall conform to ASTM D 471.

2.4.4 Non-Metallic Hydrophilic

Swellable strip type compound of polymer modified chloroprene rubber that swells upon contact with water shall conform to ASTM D 412 as follows: Tensile strength 420 psi minimum; ultimate elongation 600 percent minimum. Hardness shall be 50 minimum on the type A durometer and the volumetric expansion ratio in distilled water at 70 degrees F shall be 3 to 1 minimum.

2.4.5 Preformed Elastic Adhesive

Preformed plastic adhesive waterstops shall be produced from blends of refined hydrocarbon resins and plasticizing compounds reinforced with inert mineral filler, and shall contain no solvents, asbestos, irritating fumes or obnoxious odors. The compound shall not depend on oxidizing, evaporating, or chemical action for its adhesive or cohesive strength.

2.4.5.1 Chemical Composition

The chemical composition of the sealing compound shall meet the requirements shown below:

PERCENT BY WEIGHT

COMPONENT	MIN.	MAX.	TEST
Bitumen (Hydrocarbon plastic)	50	70	ASTM D 4
Inert Mineral Filler	30	50	AASHTO T 111
Volatile Matter		2	ASTM D 6

2.4.5.2 Adhesion Under Hydrostatic Pressure

The sealing compound shall not leak at the joints for a period of 24 hours under a vertical 6 foot head pressure. In a separate test, the sealing compound shall not leak under a horizontal pressure of 10 psi which is reached by slowly applying increments of 2 psi every minute.

2.4.5.3 Sag of Flow Resistance

Sagging shall not be detected when tested as follows: Fill a wooden form 1 inch wide and 6 inches long flush with sealing compound and place in an oven at 135 degrees F in a vertical position for 5 days.

2.4.5.4 Chemical Resistance

The sealing compound when immersed separately in a 5% solution of caustic

potash, a 5% solution of hydrochloric acid, 5% solution of sulfuric acid and a saturated hydrogen sulfide solution for 30 days at ambient room temperature shall show no visible deterioration.

PART 3 EXECUTION

3.1 JOINTS

Joints shall be installed at locations indicated and as authorized.

3.1.1 Contraction Joints

Contraction joints may be constructed by inserting tempered hardboard strips or rigid PVC or HIPS insert strips into the plastic concrete using a steel parting bar, when necessary, or by cutting the concrete with a saw after concrete has set. Joints shall be approximately 1/8 inch wide and shall extend into the slab one-fourth the slab thickness, minimum, but not less than 1 inch.

3.1.1.1 Joint Strips

Strips shall be of the required dimensions and as long as practicable. After the first floating, the concrete shall be grooved with a tool at the joint locations. The strips shall be inserted in the groove and depressed until the top edge of the vertical surface is flush with the surface of the slab. The slab shall be floated and finished as specified. Working of the concrete adjacent to the joint shall be the minimum necessary to fill voids and consolidate the concrete. Where indicated, the top portion of the strip shall be sawed out after the curing period to form a recess for sealer. The removable section of PVC or HIPS strips shall be discarded and the insert left in place. True alignment of the strips shall be maintained during insertion.

3.1.1.2 Sawed Joints

Joint sawing shall be early enough to prevent uncontrolled cracking in the slab, but late enough that this can be accomplished without appreciable spalling. Concrete sawing machines shall be adequate in number and power, and with sufficient replacement blades to complete the sawing at the required rate. Joints shall be cut to true alignment and shall be cut in sequence of concrete placement. Sludge and cutting debris shall be removed.

3.1.2 Expansion Joints

Preformed expansion joint filler shall be used in expansion and isolation joints in slabs around columns and between slabs on grade and vertical surfaces where indicated. The filler shall extend the full slab depth, unless otherwise indicated. The edges of the joint shall be neatly finished with an edging tool of 1/8 inch radius, except where a resilient floor surface will be applied. Where the joint is to receive a sealant, the filler strips shall be installed at the proper level below the finished floor with a slightly tapered, dressed and oiled wood strip temporarily secured to the top to form a recess to the size shown on the drawings. The wood strip shall be removed after the concrete has set. Contractor may opt to use a removable expansion filler cap designed and fabricated for this purpose in lieu of the wood strip. The groove shall be thoroughly cleaned of laitance, curing compound, foreign materials, protrusions of hardened concrete, and any dust which shall be blown out of the groove with oil-free compressed air.

3.1.3 Joint Sealant

Sawed contraction joints and expansion joints in slabs shall be filled with joint sealant, unless otherwise shown. Joint surfaces shall be clean, dry, and free of oil or other foreign material which would adversely affect the bond between sealant and concrete. Joint sealant shall be applied as recommended by the manufacturer of the sealant.

3.1.3.1 Joints With Preformed Compression Seals

Compression seals shall be installed with equipment capable of installing joint seals to the prescribed depth without cutting, nicking, twisting, or otherwise distorting or damaging the seal or concrete and with no more than 5 percent stretching of the seal. The sides of the joint and, if necessary, the sides of the compression seal shall be covered with a coating of lubricant. Butt joints shall be coated with liberal applications of lubricant.

3.1.3.2 Joints With Field-Molded Sealant

Joints shall not be sealed when the sealant material, ambient air, or concrete temperature is less than 40 degrees F. When the sealants are meant to reduce the sound transmission characteristics of interior walls, ceilings, and floors the guidance provided in ASTM C 919 shall be followed. Joints requiring a bond breaker shall be coated with curing compound or with bituminous paint. Bond breaker and back-up material shall be installed where required. Joints shall be primed and filled flush with joint sealant in accordance with the manufacturer's recommendations.

3.2 WATERSTOPS, INSTALLATION AND SPLICES

Waterstops shall be installed at the locations shown to form a continuous water-tight diaphragm. Adequate provision shall be made to support and completely protect the waterstops during the progress of the work. Any waterstop punctured or damaged shall be repaired or replaced. Exposed waterstops shall be protected during application of form release agents to avoid being coated. Suitable guards shall be provided to protect exposed projecting edges and ends of partially embedded waterstops from damage when concrete placement has been discontinued. Splices shall be made by certified trained personnel using approved equipment and procedures.

3.2.1 Copper And Stainless Steel

Splices in copper waterstops shall be lap joints made by brazing. Splices in stainless steel waterstops shall be welded using a TIG or MIG process utilizing a weld rod to match the stainless. All welds shall not be annealed to maintain physical properties. Carbon flame shall not be used in the annealing process. Damaged waterstops shall be repaired by removing damaged portions and patching. Patches shall overlap a minimum of 1 inch onto undamaged portion of the waterstop.

3.2.2 Flat Steel

Splices in flat steel waterstops shall be properly aligned, butt welded, and cleaned of excessive material.

3.2.3 Non-Metallic

Fittings shall be shop made using a machine specifically designed to mechanically weld the waterstop. A miter guide, proper fixturing (profile dependant), and portable power saw shall be used to miter cut the ends to be joined to ensure good alignment and contact between joined surfaces. The splicing of straight lengths shall be done by squaring the ends to be joined. Continuity of the characteristic features of the cross section of the waterstop (ribs, tabular center axis, protrusions, etc.) shall be maintained across the splice.

3.2.3.1 Rubber Waterstop

Splices shall be vulcanized or shall be made using cold bond adhesive as recommended by the manufacturer. Splices for TPE-R shall be as specified for PVC.

3.2.3.2 Polyvinyl Chloride Waterstop

Splices shall be made by heat sealing the adjacent waterstop edges together using a thermoplastic splicing iron utilizing a non-stick surface specifically designed for waterstop welding. The correct temperature shall be used to sufficiently melt without charring the plastic. The spliced area, when cooled, shall show no signs of separation, holes, or other imperfections when bent by hand in as sharp an angle as possible.

3.2.3.3 Quality Assurance

Edge welding will not be permitted. Centerbulbs shall be compressed or closed when welding to non-centerbulb type. Waterstop splicing defects which are unacceptable include, but are not limited to the following: 1) Tensile strength less than 80 percent of parent section. 2) Free lap joints. 3) Misalignment of centerbulb, ribs, and end bulbs greater than 1/16 inch. 4) Misalignment which reduces waterstop cross section more than 15 percent. 5) Bond failure at joint deeper than 1/16 inch or 15 percent of material thickness. 6) Misalignment of waterstop splice resulting in misalignment of waterstop in excess of 1/2 inch in 10 feet. 7) Visible porosity in the weld area, including pin holes. 8) Charred or burnt material. 9) Bubbles or inadequate bonding. 10) Visible signs of splice separation when cooled splice is bent by hand at a sharp angle.

3.2.4 Non-Metallic Hydrophilic Waterstop Installation

Ends to be joined shall be miter cut with sharp knife or shears. The ends shall be adhered with cyanacryiate (super glue) adhesive. When joining hydrophilic type waterstop to PVC waterstop, the hydrophilic waterstop shall be positioned as shown on the drawings. A liberal amount of a single component hydrophilic sealant shall be applied to the junction to complete the transition.

3.2.5 Preformed Plastic Adhesive Installation

The installation of preformed plastic adhesive waterstops shall be a prime, peel, place and pour procedure. Joint surfaces shall be clean and dry before priming and just prior to placing the sealing strips. The end of each strip shall be spliced to the next strip with a 1 inch overlap; the overlap shall be pressed firmly to release trapped air. During damp or cold conditions the joint surface shall be flashed with a safe, direct flame to warm and dry the surface adequately; the sealing strips shall be

dipped in warm water to soften the material to achieve maximum bond to the concrete surface.

3.3 CONSTRUCTION JOINTS

Construction joints are specified in Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE except that construction joints coinciding with expansion and contraction joints shall be treated as expansion or contraction joints as applicable.

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SECTION 03200

CONCRETE REINFORCEMENT
09/97

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ACI INTERNATIONAL (ACI)

ACI 318/318R	(1995) Building Code Requirements for Structural Concrete and Commentary

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 615	(1996a) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 706	(1998) Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

AMERICAN WELDING SOCIETY (AWS)

AWS D1.4	(1998) Structural Welding Code - Reinforcing Steel

CONCRETE REINFORCING STEEL INSTITUTE (CRSI)

CRSI 1MSP	(2001) Manual of Standard Practice

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Reinforcement; G, AE.

Detail drawings showing reinforcing steel placement, schedules, sizes, grades, and splicing and bending details. Drawings shall show support details including types, sizes and spacing.

SD-03 Product Data

Welding; G, AE.

A list of qualified welders names.

SD-07 Certificates

Reinforcing Steel.

Certified copies of mill reports attesting that the reinforcing steel furnished contains no less than 25 percent recycled scrap steel and meets the requirements specified herein, prior to the installation of reinforcing steel.

1.3 WELDING

Welders shall be qualified in accordance with AWS D1.4. Qualification test shall be performed at the worksite and the Contractor shall notify the Contracting Officer 24 hours prior to conducting tests. Special welding procedures and welders qualified by others may be accepted as permitted by AWS D1.4.

1.4 DELIVERY AND STORAGE

Reinforcement and accessories shall be stored off the ground on platforms, skids, or other supports.

PART 2 PRODUCTS

2.1 REINFORCING STEEL

Reinforcing steel shall be deformed bars conforming to ASTM A 615 or ASTM A 706, grades and sizes as indicated.

2.2 WIRE TIES

Wire ties shall be 16 gauge or heavier black annealed steel wire.

2.3 SUPPORTS

Bar supports for formed surfaces shall be designed and fabricated in accordance with CRSI 1MSP and shall be steel or precast concrete blocks. Precast concrete blocks shall have wire ties and shall be not less than 4 inches square when supporting reinforcement on ground. Precast concrete block shall have compressive strength equal to that of the surrounding concrete. Where concrete formed surfaces will be exposed to weather or where surfaces are to be painted, steel supports within 1/2 inch of concrete surface shall be galvanized, plastic protected or of stainless steel. Concrete supports used in concrete exposed to view shall have the same color and texture as the finish surface. For slabs on grade, supports shall be precast concrete blocks, plastic coated steel fabricated with bearing plates, or specifically designed wire-fabric supports fabricated of plastic.

2.4 SYNTHETIC FIBER REINFORCEMENT

Synthetic fiber shall be polypropylene with a denier less than 100 and a nominal fiber length of 2 inches.

PART 3 EXECUTION

3.1 REINFORCEMENT

Reinforcement shall be fabricated to shapes and dimensions shown and shall conform to the requirements of ACI 318/318R. Reinforcement shall be cold bent unless otherwise authorized. Bending may be accomplished in the field or at the mill. Bars shall not be bent after embedment in concrete. Safety caps shall be placed on all exposed ends of vertical concrete reinforcement bars that pose a danger to life safety. Wire tie ends shall face away from the forms.

3.1.1 Placement

Reinforcement shall be free from loose rust and scale, dirt, oil, or other deleterious coating that could reduce bond with the concrete. Reinforcement shall be placed in accordance with ACI 318/318R at locations shown plus or minus one bar diameter. Reinforcement shall not be continuous through expansion joints and shall be as indicated through construction or contraction joints. Concrete coverage shall be as indicated or as required by ACI 318/318R. If bars are moved more than one bar diameter to avoid interference with other reinforcement, conduits or embedded items, the resulting arrangement of bars, including additional bars required to meet structural requirements, shall be approved before concrete is placed.

3.1.2 Splicing

Splices of reinforcement shall conform to ACI 318/318R and shall be made only as required or indicated. Splicing shall be by lapping or by mechanical or welded butt connection; except that lap splices shall not be used for bars larger than No. 11 unless otherwise indicated. Welding shall conform to AWS D1.4. Welded butt splices shall be full penetration butt welds. Lapped bars shall be placed in contact and securely tied or spaced transversely apart to permit the embedment of the entire surface of each bar in concrete. Lapped bars shall not be spaced farther apart than one-fifth the required length of lap or 6 inches. Mechanical butt splices shall be in accordance with the recommendation of the manufacturer of the mechanical splicing device. Butt splices shall develop 125 percent of the specified minimum yield tensile strength of the spliced bars or of the smaller bar in transition splices. Bars shall be flame dried before butt splicing. Adequate jigs and clamps or other devices shall be provided to support, align, and hold the longitudinal centerline of the bars to be butt spliced in a straight line.

3.2 DOWEL INSTALLATION

Dowels shall be installed in slabs on grade at locations indicated and at right angles to joint being doweled. Dowels shall be accurately positioned and aligned parallel to the finished concrete surface before concrete placement. Dowels shall be rigidly supported during concrete placement. One end of dowels shall be coated with a bond breaker.

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SECTION 03300

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11/01

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SECTION 03300

CAST-IN-PLACE STRUCTURAL CONCRETE
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ACI INTERNATIONAL (ACI)

ACI 117	(1990; Errata) Standard Tolerances for Concrete Construction and Materials
ACI 211.1	(1991) Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 214.3R	(1988; R 1997) Simplified Version of the Recommended Practice for Evaluation of Strength Test Results of Concrete
ACI 305R	(1999) Hot Weather Concreting
ACI 318/318R	(1999) Building Code Requirements for Structural Concrete and Commentary

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 182	(1991; R 1996) Burlap Cloth Made from Jute or Kenaf

ASTM INTERNATIONAL (ASTM)

ASTM C 1017	(1998) Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C 1064	(1999) Temperature of Freshly Mixed Portland Cement Concrete
ASTM C 1077	(1998) Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM C 1107	(1999) Packaged Dry, Hydraulic-Cement Grout(Nonshrink)
ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates

ASTM C 143	(2000) Slump of Hydraulic Cement Concrete
ASTM C 150	(1999a) Portland Cement
ASTM C 172	(1999) Sampling Freshly Mixed Concrete
ASTM C 173	(1994ael) Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C 192/C 192M	(2000) Making and Curing Concrete Test Specimens in the Laboratory
ASTM C 231	(1997el) Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260	(2000) Air-Entraining Admixtures for Concrete
ASTM C 31	(2000e1) Making and Curing Concrete Test Specimens in the Field
ASTM C 33	(1999ae1) Concrete Aggregates
ASTM C 39	(2001) Compressive Strength of Cylindrical Concrete Specimens
ASTM C 42	(1999) Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C 494	(1999ae1) Chemical Admixtures for Concrete
ASTM C 595	(2000a) Blended Hydraulic Cements
ASTM C 618	(2000) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM C 78	(1994) Flexural Strength of Concrete (Using Simple Beam With Third-Point Loading)
ASTM C 937	(1997) Grout Fluidifier for Preplaced-Aggregate Concrete
ASTM C 94	(2000e2) Ready-Mixed Concrete
ASTM D 1751	(1999) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D 75	(1987; R 1997) Sampling Aggregates
ASTM E 96	(2000) Water Vapor Transmission of Materials

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

NIST HB 44	(1997) NIST Handbook 44: Specifications,

	Tolerances, and other Technical Requirements for Weighing and Measuring Devices

NATIONAL READY-MIXED CONCRETE ASSOCIATION (NRMCA)

NRMCA CPMB 100	(1996) Concrete Plant Standards \n/c\X
NRMCA QC 3	(1984) Quality Control Manual: Section 3, Plant Certifications Checklist: Certification of Ready Mixed Concrete Production Facilities
NRMCA TMMB 100	(1994) Truck Mixer Agitator and Front Discharge Concrete Carrier Standards

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 104	(1980) Method of Calculation of the Fineness Modulus of Aggregate
COE CRD-C 400	(1963) Requirements for Water for Use in Mixing or Curing Concrete
COE CRD-C 521	(1981) Standard Test Method for Frequency and Amplitude of Vibrators for Concrete
COE CRD-C 540	(1971; R 1981) Standard Specification for Nonbituminous Inserts for Contraction Joints in Portland Cement Concrete Airfield Pavements, Sawable Type
COE CRD-C 572	(1974) Corps of Engineers Specifications for Polyvinylchloride Waterstop
COE CRD-C 94	(1995) Surface Retarders

1.2 LUMP SUM CONTRACT

Under this type of contract concrete items will be paid for by lump sum and will not be measured. The work covered by these items consists of furnishing all concrete materials, reinforcement, miscellaneous embedded materials, and equipment, and performing all labor for the forming, manufacture, transporting, placing, finishing, curing, and protection of concrete in these structures.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Mixture Proportions; G, AE

The results of trial mixture design studies along with a

statement giving the maximum nominal coarse aggregate size and the proportions of ingredients that will be used in the manufacture of each strength or class of concrete, at least 14 days prior to commencing concrete placing operations. Aggregate weights shall be based on the saturated surface dry condition. The statement shall be accompanied by test results from an approved independent commercial testing laboratory, showing that mixture design studies have been made with materials proposed for the project and that the proportions selected will produce concrete of the qualities indicated. No substitutions shall be made in the materials used in the mixture design studies without additional tests to show that the quality of the concrete is satisfactory.

SD-04 Samples

Surface Retarder.

Sample of surface retarder material with manufacturer's instructions for application in conjunction with air-water cutting.

SD-06 Test Reports

Testing and Inspection for Contractor Quality Control; G, AE.

Certified copies of laboratory test reports, including mill tests and all other test data, for portland cement, blended cement, pozzolan, ground granulated blast furnace slag, silica fume, aggregate, admixtures, and curing compound proposed for use on this project.

SD-07 Certificates

Qualifications.

Written documentation for Contractor Quality Control personnel.

Regulatory Requirements.

Report stating that the products contain recycled materials and indicating the actual percentages of post-consumer and/or post-industrial recyceled materials by weight.

Local Materials

Submit report which proudcts and their quantities by cost which were manufactured within 500 miles of the project.

1.4 QUALIFICATIONS

Contractor Quality Control personnel assigned to concrete construction shall be American Concrete Institute (ACI) Certified Workmen in one of the following grades or shall have written evidence of having completed similar qualification programs:

Concrete Field Testing Technician, Grade I
Concrete Laboratory Testing Technician, Grade I or II
Concrete Construction Inspector, Level II

Concrete Transportation Construction Inspector or
Reinforced Concrete Special Inspector, Jointly certified by American Concrete Institute (ACI), Building Official and Code Administrators International (BOCA), International Conference of Building Officials (ICBO), and Southern Building Code Congress International (SBCCI).

The foreman or lead journeyman of the flatwork finishing crew shall have similar qualification for ACI Concrete Flatwork Technician/Finisher or equal, with written documentation.

1.5 FIELD TEST PANELS

Field test panels shall be constructed prior to beginning of work using the materials and procedures proposed for use on the job, to demonstrate the results to be attained. The quality and appearance of each panel shall be subject to the approval of the Contracting Officer, and, if not judged satisfactory, additional panels shall be constructed until approval is attained. Formed or finished surfaces in the completed structure shall match the quality and appearance of the approved field example.

1.6 GENERAL REQUIREMENTS

1.6.1 Tolerances

Except as otherwise specified herein, tolerances for concrete batching, mixture properties, and construction as well as definition of terms and application practices shall be in accordance with ACI 117. Level and grade tolerance measurements of slabs shall be made as soon as possible after finishing; when forms or shoring are used, the measurements shall be made prior to removal.

1.6.1.1 Floors

For the purpose of this Section the following terminology correlation between ACI 117 and this Section shall apply:

Floor Profile Quality Classification From ACI 117	This Section
Conventional Bullfloated	Same
Conventional Straightedged	Same
Flat	Float Finish or Trowel Finish
Very Flat	Same. Use only with F-system

Levelness tolerance shall not apply where design requires floors to be sloped to drains or sloped for other reasons.

1.6.1.2 Floors by the Straightedge System

The flatness of the floors shall be carefully controlled and the tolerances shall be measured by the straightedge system as specified in paragraph 4.5.7 of ACI 117, using a 10 foot straightedge, within 72 hours after floor slab installation and before shores and/or forms are removed. The listed tolerances shall be met at any and every location at which the straightedge can be placed.

Bullfloated 1/2 inch
Straightedged 5/16 inches

Float Finish 1/4 inch
Trowel Finish 1/4 inch

1.6.2 Strength Requirements and w/c Ratio

1.6.2.1 Strength Requirements

Specified compressive strength (f'c) shall be as follows:

COMPRESSIVE STRENGTH	STRUCTURE OR PORTION OF STRUCTURE
5000 psi at 28 days	Pre curb members
4000 psi at 28 days	Foundations & slab on grade

Concrete slabs on-grade shall have a 28-day flexural strength of 650 psi. Concrete made with high-early strength cement shall have a 7-day strength equal to the specified 28-day strength for concrete made with Type I or II portland cement. Compressive strength shall be determined in accordance with ASTM C 39. Flexural strength shall be determined in accordance with ASTM C 78.

a. Evaluation of Concrete Compressive Strength. Compressive strength specimens (6 by 12 inch cylinders) shall be fabricated by the Contractor and laboratory cured in accordance with ASTM C 31 and tested in accordance with ASTM C 39. The strength of the concrete will be considered satisfactory so long as the average of all sets of three consecutive test results equals or exceeds the specified compressive strength f'c and no individual test result falls below the specified strength f'c by more than 500 psi. A "test" is defined as the average of two companion cylinders, or if only one cylinder is tested, the results of the single cylinder test. Additional analysis or testing, including taking cores and/or load tests may be required at the Contractor's expense when the strength of the concrete in the structure is considered potentially deficient.

b. Investigation of Low-Strength Compressive Test Results. When any strength test of standard-cured test cylinders falls below the specified strength requirement by more than 500 psi or if tests of field-cured cylinders indicate deficiencies in protection and curing, steps shall be taken to assure that the load-carrying capacity of the structure is not jeopardized. When the strength of concrete in place is considered potentially deficient, cores shall be obtained and tested in accordance with ASTM C 42. At least three representative cores shall be taken from each member or area of concrete in place that is considered potentially deficient. The location of cores will be determined by the Contracting Officer to least impair the strength of the structure. Concrete in the area represented by the core testing will be considered adequate if the average strength of the cores is equal to at least 85 percent of the specified strength requirement and if no single core is less than 75 percent of the specified strength requirement. Non-destructive tests (tests other than test cylinders or cores) shall not be used as a basis for acceptance or rejection. The Contractor shall perform the coring and repair the holes. Cores will be tested by the Government.

c. Load Tests. If the core tests are inconclusive or impractical to

obtain or if structural analysis does not confirm the safety of the structure, load tests may be directed by the Contracting Officer in accordance with the requirements of ACI 318/318R. Concrete work evaluated by structural analysis or by results of a load test as being understrength shall be corrected in a manner satisfactory to the Contracting Officer. All investigations, testing, load tests, and correction of deficiencies shall be performed by and at the expense of the Contractor and must be approved by the Contracting Officer, except that if all concrete is found to be in compliance with the drawings and specifications, the cost of investigations, testing, and load tests will be at the expense of the Government.

d. Evaluation of Concrete Flexural Strength. Flexural strength specimens (beams) shall be fabricated by the Contractor and laboratory cured in accordance with ASTM C 31 and tested in accordance with ASTM C 78. The strength of the concrete will be considered satisfactory so long as the average of all sets of three consecutive test results equals or exceeds the specified flexural strength and no individual test result falls below the specified flexural strength by more than 50 psi.A "test" is defined as the average of two companion beams. Additional analysis or testing, including taking cores and/or load tests may be required at the Contractor's expense when the strength of the concrete in the slab is considered potentially deficient.

1.6.2.2 Water-Cement Ratio

Maximum water-cement ratio (w/c) for normal weight concrete shall be as follows:

WATER-CEMENT RATIO, BY WEIGHT	STRUCTURE OR PORTION OF STRUCTURE
0.45	All concrete

These w/c's may cause higher strengths than that required above for compressive or flexural strength. The maximum w/c required will be the equivalent w/c as determined by conversion from the weight ratio of water to cement plus pozzolan, silica fume, and ground granulated blast furnace slag (GGBF slag) by the weight equivalency method as described in ACI 211.1. In the case where silica fume or GGBF slag is used, the weight of the silica fume and GGBF slag shall be included in the equations of ACI 211.1 for the term P which is used to denote the weight of pozzolan.

1.6.3 Air Entrainment

All normal weight concrete shall be air entrained to contain between 4 and 7 percent total air, except that when the nominal maximum size coarse aggregate is 3/4 inch or smaller it shall be between 4.5 and 7.5 percent. Concrete with specified strength over 5000 psi may have 1.0 percent less air than specified above. Specified air content shall be attained at point of placement into the forms. Air content for normal weight concrete shall be determined in accordance with ASTM C 231.

1.6.4 Slump

Slump of the concrete, as delivered to the point of placement into the

forms, shall be within the following limits. Slump shall be determined in accordance with ASTM C 143.

Structural Element	Slump Minimum	Slump Maximum
Foundation walls, substructure walls, footings, slabs	1 in.	3 in.
Any structural concrete approved for placement by pumping:		
At pump	2 in.	6 in.
At discharge of line	1 in.	4 in.

When use of a plasticizing admixture conforming to ASTM C 1017 or when a Type F or G high range water reducing admixture conforming to ASTM C 494 is permitted to increase the slump of concrete, concrete shall have a slump of 2 to 4 inches before the admixture is added and a maximum slump of 8 inches at the point of delivery after the admixture is added.

1.6.5 Concrete Temperature

The temperature of the concrete as delivered shall not exceed 90 degrees F. When the ambient temperature during placing is 40 degrees F or less, or is expected to be at any time within 6 hours after placing, the temperature of the concrete as delivered shall be between 55 and 75 degrees F.

1.6.6 Size of Coarse Aggregate

The largest feasible nominal maximum size aggregate (NMSA) specified in paragraph AGGREGATES shall be used in each placement. However, nominal maximum size of aggregate shall not exceed any of the following: three-fourths of the minimum cover for reinforcing bars, three-fourths of the minimum clear spacing between reinforcing bars, one-fifth of the narrowest dimension between sides of forms, or one-third of the thickness of slabs or toppings.

1.6.7 Special Properties and Products

Concrete may contain admixtures other than air entraining agents, such as water reducers, superplasticizers, or set retarding agents to provide special properties to the concrete, if specified or approved. Any of these materials to be used on the project shall be used in the mix design studies.

1.7 MIXTURE PROPORTIONS

Concrete shall be composed of portland cement, other cementitious and pozzolanic materials as specified, aggregates, water and admixtures as specified.

1.7.1 Proportioning Studies for Normal Weight Concrete

Trial design batches, mixture proportioning studies, and testing requirements for various classes and types of concrete specified shall be the responsibility of the Contractor. Except as specified for flexural

strength concrete, mixture proportions shall be based on compressive strength as determined by test specimens fabricated in accordance with ASTM C 192/C 192M and tested in accordance with ASTM C 39. Samples of all materials used in mixture proportioning studies shall be representative of those proposed for use in the project and shall be accompanied by the manufacturer's or producer's test reports indicating compliance with these specifications. Trial mixtures having proportions, consistencies, and air content suitable for the work shall be made based on methodology described in ACI 211.1, using at least three different water-cement ratios for each type of mixture, which will produce a range of strength encompassing those required for each class and type of concrete required on the project. The maximum water-cement ratios required in subparagraph Water-Cement Ratio will be the equivalent water-cement ratio as determined by conversion from the weight ratio of water to cement plus pozzolan, silica fume, and ground granulated blast furnace slag (GGBF slag) by the weight equivalency method as described in ACI 211.1. In the case where silica fume or GGBF slag is used, the weight of the silica fume and GGBF slag shall be included in the equations in ACI 211.1 for the term P, which is used to denote the weight of pozzolan. If pozzolan is used in the concrete mixture, the minimum pozzolan content shall be 15 percent by weight of the total cementitious material, and the maximum shall be 35 percent. Laboratory trial mixtures shall be designed for maximum permitted slump and air content. Separate sets of trial mixture studies shall be made for each combination of cementitious materials and each combination of admixtures proposed for use. No combination of either shall be used until proven by such studies, except that, if approved in writing and otherwise permitted by these specifications, an accelerator or a retarder may be used without separate trial mixture study. Separate trial mixture studies shall also be made for concrete for any conveying or placing method proposed which requires special properties and for concrete to be placed in unusually difficult placing locations. The temperature of concrete in each trial batch shall be reported. For each water-cement ratio, at least three test cylinders for each test age shall be made and cured in accordance withASTM C 192/C 192M. They shall be tested at 7 and 28 days in accordance with ASTM C 39. From these test results, a curve shall be plotted showing the relationship between water-cement ratio and strength for each set of trial mix studies. In addition, a curve shall be plotted showing the relationship between 7 day and 28 day strengths. Each mixture shall be designed to promote easy and suitable concrete placement, consolidation and finishing, and to prevent segregation and excessive bleeding.

1.7.2 Proportioning Studies for Flexural Strength Concrete

Trial design batches, mixture proportioning studies, and testing requirements shall conform to the requirements specified in paragraph Proportioning Studies for Normal Weight Concrete, except that proportions shall be based on flexural strength as determined by test specimens (beams) fabricated in accordance with ASTM C 192/C 192M and tested in accordance with ASTM C 78. Procedures given in ACI 211.1 shall be modified as necessary to accommodate flexural strength.

1.7.3 Average Compressive Strength Required for Mixtures

The mixture proportions selected during mixture design studies shall produce a required average compressive strength (f'cr) exceeding the specified compressive strength (f'c) by the amount indicated below. This required average compressive strength, f'cr, will not be a required acceptance criteria during concrete production. However, whenever the daily average compressive strength at 28 days drops below f'cr during

concrete production, or daily average 7-day strength drops below a strength correlated with the 28-day f'cr, the mixture shall be adjusted, as approved, to bring the daily average back up to f'cr. During production, the required f'cr shall be adjusted, as appropriate, based on the standard deviation being attained on the job.

1.7.3.1 Computations from Test Records

Where a concrete production facility has test records, a standard deviation shall be established in accordance with the applicable provisions of ACI 214.3R. Test records from which a standard deviation is calculated shall represent materials, quality control procedures, and conditions similar to those expected; shall represent concrete produced to meet a specified strength or strengths (f'c) within 1,000 psi of that specified for proposed work; and shall consist of at least 30 consecutive tests. A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days. Required average compressive strength f'cr used as the basis for selection of concrete proportions shall be the larger of the equations that follow using the standard deviation as determined above:

f'cr = f'c + 1.34S where units are in psi

f'cr = f'c + 2.33S - 500 where units are in psi

Where S = standard deviation

Where a concrete production facility does not have test records meeting the requirements above but does have a record based on 15 to 29 consecutive tests, a standard deviation shall be established as the product of the calculated standard deviation and a modification factor from the following table:

NUMBER OF TESTS	MODIFICATION FACTOR FOR STANDARD DEVIATION
15	1.16
20	1.08
25	1.03
30 or more	1.00

1.7.3.2 Computations without Previous Test Records

When a concrete production facility does not have sufficient field strength test records for calculation of the standard deviation, the required average strength f'cr shall be determined as follows:

a. If the specified compressive strength f'c is less than 3,000 psi,

f'cr = f'c + 1000 psi

b. If the specified compressive strength f'c is 3,000 to 5,000 psi,

f'cr = f'c + 1,200 psi

c. If the specified compressive strength f'c is over 5,000 psi,

f'cr = f'c + 1,400 psi

1.7.4 Average Flexural Strength Required for Mixtures

The mixture proportions selected during mixture design studies for flexural strength mixtures and the mixture used during concrete production shall be designed and adjusted during concrete production as approved, except that the overdesign for average flexural strength shall simply be 15 percent greater than the specified flexural strength at all times.

1.8 STORAGE OF MATERIALS

Cement and other cementitious materials shall be stored in weathertight buildings, bins, or silos which will exclude moisture and contaminants and keep each material completely separated. Aggregate stockpiles shall be arranged and used in a manner to avoid excessive segregation and to prevent contamination with other materials or with other sizes of aggregates. Aggregate shall not be stored directly on ground unless a sacrificial layer is left undisturbed. Reinforcing bars and accessories shall be stored above the ground on platforms, skids or other supports. Other materials shall be stored in such a manner as to avoid contamination and deterioration. Admixtures which have been in storage at the project site for longer than 6 months or which have been subjected to freezing shall not be used unless retested and proven to meet the specified requirements. Materials shall be capable of being accurately identified after bundles or containers are opened.

1.9 GOVERNMENT ASSURANCE INSPECTION AND TESTING

Day-to day inspection and testing shall be the responsibility of the Contractor Quality Control (CQC) staff. However, representatives of the Contracting Officer can and will inspect construction as considered appropriate and will monitor operations of the Contractor's CQC staff. Government inspection or testing will not relieve the Contractor of any of his CQC responsibilities.

1.9.1 Materials

The Government will sample and test aggregates, cementitious materials, other materials, and concrete to determine compliance with the specifications as considered appropriate. The Contractor shall provide facilities and labor as may be necessary for procurement of representative test samples. Samples of aggregates will be obtained at the point of batching in accordance with ASTM D 75. Other materials will be sampled from storage at the jobsite or from other locations as considered appropriate. Samples may be placed in storage for later testing when appropriate.

1.9.2 Fresh Concrete

Fresh concrete will be sampled as delivered in accordance with ASTM C 172 and tested in accordance with these specifications, as considered necessary.

1.9.3 Hardened Concrete

Tests on hardened concrete will be performed by the Government when such tests are considered necessary.

1.9.4 Inspection

Concrete operations may be tested and inspected by the Government as the

project progresses. Failure to detect defective work or material will not prevent rejection later when a defect is discovered nor will it obligate the Government for final acceptance.

1.10 Material Selection

Contractor shall, as much as possible, select material manufacturers that reduce pollutant and waste, recycle waste, reuse resources and scrap, and reclaim materials instead of disposing into a land fill. Select material manufacturers that are located within 500 miles of the project.

PART 2 PRODUCTS

2.1 CEMENTITIOUS MATERIALS

Cementitious Materials shall be portland cement, portland-pozzolan cement, or portland cement in combination with pozzolan and shall conform to appropriate specifications listed below. Use of cementitious materials in concrete which will have surfaces exposed in the completed structure shall be restricted so there is no change in color, source, or type of cementitious material.

2.1.1 Portland Cement

ASTM C 150, Type I low alkali with a maximum 15 percent amount of tricalcium aluminate, or Type II low alkali. White portland cement shall meet the above requirements except that it may be Type I, Type II or Type III low alkali. White Type III shall be used only in specific areas of the structure, when approved in writing.

2.1.2 High-Early-Strength Portland Cement

ASTM C 150, Type III with tricalcium aluminate limited to 5 percent. Type III cement shall be used only in isolated instances and only when approved in writing.

2.1.3 Blended Cements

ASTM C 595, Type IP.

2.1.4 Pozzolan (Fly Ash)

ASTM C 618, Class F with the optional requirements for multiple factor, drying shrinkage, and uniformity from Table 2A of ASTM C 618. Requirement for maximum alkalies from Table 1A of ASTM C 618 shall apply. If pozzolan is used, it shall never be less than 15 percent nor more than 35 percent by weight of the total cementitious material. The Contractor shall comply with EPA requirements in accordance with Section 01670 RECYCLED / RECOVERED MATERIALS.

2.2 AGGREGATES

Aggregates shall conform to the following.

2.2.1 Fine Aggregate

Fine aggregate shall conform to the quality and gradation requirements of ASTM C 33.

2.2.2 Coarse Aggregate

Coarse aggregate shall conform to ASTM C 33, Class 5S, size designation 1 inch maximum.

2.3 CHEMICAL ADMIXTURES

Chemical admixtures, when required or permitted, shall conform to the appropriate specification listed. Admixtures shall be furnished in liquid form and of suitable concentration for easy, accurate control of dispensing.

2.3.1 Air-Entraining Admixture

ASTM C 260 and shall consistently entrain the air content in the specified ranges under field conditions.

2.3.2 Accelerating Admixture

ASTM C 494, Type C or E, except that calcium chloride or admixtures containing calcium chloride shall not be used.

2.3.3 Water-Reducing or Retarding Admixture

ASTM C 494, Type A, B, or D, except that the 6-month and 1-year compressive and flexural strength tests are waived.

2.3.4 High-Range Water Reducer

ASTM C 494, Type F or G, except that the 6-month and 1-year strength requirements are waived. The admixture shall be used only when approved in writing, such approval being contingent upon particular mixture control as described in the Contractor's Quality Control Plan and upon performance of separate mixture design studies.

2.3.5 Surface Retarder

COE CRD-C 94.

2.3.6 Expanding Admixture

Aluminum powder type expanding admixture conforming to ASTM C 937.

2.3.7 Other Chemical Admixtures

Chemical admixtures for use in producing flowing concrete shall comply with ASTM C 1017, Type I or II. These admixtures shall be used only when approved in writing, such approval being contingent upon particular mixture control as described in the Contractor's Quality Control Plan and upon performance of separate mixture design studies.

2.4 CURING MATERIALS

2.4.1 Burlap and Cotton Mat

Burlap and cotton mat used for curing shall conform to AASHTO M 182.

2.5 WATER

Water for mixing and curing shall be fresh, clean, potable, and free of

injurious amounts of oil, acid, salt, or alkali, except that non-potable water may be used if it meets the requirements of COE CRD-C 400.

2.6 NONSHRINK GROUT

Nonshrink grout shall conform to ASTM C 1107, Grade A, and shall be a commercial formulation suitable for the proposed application.

2.7 VAPOR BARRIER

Vapor barrier shall be polyethylene sheeting with a minimum thickness of 50 mils or other equivalent material having a vapor permeance rating not exceeding 0.5 perms as determined in accordance with ASTM E 96.

2.8 JOINT MATERIALS

2.8.1 Joint Fillers, Sealers, and Waterstops

Expansion joint fillers shall be preformed materials conforming to ASTM D 1751. Materials for waterstops shall be in accordance with Section 03150 EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS. Materials for and sealing of joints shall conform to the requirements of Section 07920 JOINT SEALANTS.

2.8.2 Contraction Joints in Slabs

Sawable type contraction joint inserts shall conform to COE CRD-C 540. Nonsawable joint inserts shall have sufficient stiffness to permit placement in plastic concrete without undue deviation from a straight line and shall conform to the physical requirements of COE CRD-C 540, with the exception of Section 3.4 "Resistance to Sawing". Plastic inserts shall be polyvinyl chloride conforming to the materials requirements of COE CRD-C 572.

PART 3 EXECUTION

3.1 PREPARATION FOR PLACING

Before commencing concrete placement, the following shall be performed. Surfaces to receive concrete shall be clean and free from frost, ice, mud, and water. Forms shall be in place, cleaned, coated, and adequately supported, in accordance with Section 03100 STRUCTURAL CONCRETE FORMWORK. Reinforcing steel shall be in place, cleaned, tied, and adequately supported, in accordance with Section 03200 CONCRETE REINFORCEMENT. Transporting and conveying equipment shall be in-place, ready for use, clean, and free of hardened concrete and foreign material. Equipment for consolidating concrete shall be at the placing site and in proper working order. Equipment and material for curing and for protecting concrete from weather or mechanical damage shall be at the placing site, in proper working condition and in sufficient amount for the entire placement. When hot, windy conditions during concreting appear probable, equipment and material shall be at the placing site to provide windbreaks, shading, fogging, or other action to prevent plastic shrinkage cracking or other damaging drying of the concrete.

3.1.1 Foundations

3.1.1.1 Concrete on Earth Foundations

Earth (subgrade, base, or subbase courses) surfaces upon which concrete is

to be placed shall be clean, damp, and free from debris, frost, ice, and standing or running water. Prior to placement of concrete, the foundation shall be well drained and shall be satisfactorily graded and uniformly compacted.

3.1.1.2 Preparation of Rock

Rock surfaces upon which concrete is to be placed shall be free from oil, standing or running water, ice, mud, drummy rock, coating, debris, and loose, semidetached or unsound fragments. Joints in rock shall be cleaned to a satisfactory depth, as determined by the Contracting Officer, and to firm rock on the sides. Immediately before the concrete is placed, rock surfaces shall be cleaned thoroughly by the use of air-water jets or sandblasting as specified below for Previously Placed Concrete. Rock surfaces shall be kept continuously moist for at least 24 hours immediately prior to placing concrete thereon. All horizontal and approximately horizontal surfaces shall be covered, immediately before the concrete is placed, with a layer of mortar proportioned similar to that in the concrete mixture. Concrete shall be placed before the mortar stiffens.

3.1.1.3 Excavated Surfaces in Lieu of Forms

Concrete for footings and walls may be placed directly against the soil provided the earth or rock has been carefully trimmed, is uniform and stable, and meets the compaction requirements of Section 02300 EARTHWORK.. The concrete shall be placed without becoming contaminated by loose material, and the outline of the concrete shall be within the specified tolerances.

3.1.2 Previously Placed Concrete

Concrete surfaces to which additional concrete is to be bonded shall be prepared for receiving the next horizontal lift by cleaning the construction joint surface with either air-water cutting, sandblasting, high-pressure water jet, or other approved method. Concrete at the side of vertical construction joints shall be prepared as approved by the Contracting Officer. Air-water cutting shall not be used on formed surfaces or surfaces congested with reinforcing steel. Regardless of the method used, the resulting surfaces shall be free from all laitance and inferior concrete so that clean surfaces of well bonded coarse aggregate are exposed and make up at least 10-percent of the surface area, distributed uniformly throughout the surface. The edges of the coarse aggregate shall not be undercut. The surface of horizontal construction joints shall be kept continuously wet for the first 12 hours during the 24-hour period prior to placing fresh concrete. The surface shall be washed completely clean as the last operation prior to placing the next lift. For heavy duty floors and two-course floors a thin coat of neat cement grout of about the consistency of thick cream shall be thoroughly scrubbed into the existing surface immediately ahead of the topping placing. The grout shall be a 1:1 mixture of portland cement and sand passing the No. 8 sieve. The topping concrete shall be deposited before the grout coat has had time to stiffen.

3.1.2.1 Air-Water Cutting

Air-water cutting of a fresh concrete surface shall be performed at the proper time and only on horizontal construction joints. The air pressure used in the jet shall be 100 psi plus or minus, 10 psi, and the water pressure shall be just sufficient to bring the water into effective

influence of the air pressure. When approved by the Contracting Officer, a surface retarder complying with the requirements of COE CRD-C 94 may be applied to the surface of the lift in order to prolong the period of time during which air-water cutting is effective. After cutting, the surface shall be washed and rinsed as long as there is any trace of cloudiness of the wash water. Where necessary to remove accumulated laitance, coatings, stains, debris, and other foreign material, high-pressure waterjet or sandblasting shall be used as the last operation before placing the next lift.

3.1.2.2 High-Pressure Water Jet

A stream of water under a pressure of not less than 3,000 psi shall be used for cutting and cleaning. Its use shall be delayed until the concrete is sufficiently hard so that only the surface skin or mortar is removed and there is no undercutting of coarse-aggregate particles. If the waterjet is incapable of a satisfactory cleaning, the surface shall be cleaned by sandblasting.

3.1.2.3 Wet Sandblasting

Wet sandblasting shall be used after the concrete has reached sufficient strength to prevent undercutting of the coarse aggregate particles. After wet sandblasting, the surface of the concrete shall then be washed thoroughly to remove all loose materials.

3.1.2.4 Waste Disposal

The method used in disposing of waste water employed in cutting, washing, and rinsing of concrete surfaces shall be such that the waste water does not stain, discolor, or affect exposed surfaces of the structures, or damage the environment of the project area. The method of disposal shall be subject to approval.

3.1.2.5 Preparation of Previously Placed Concrete

Concrete surfaces to which other concrete is to be bonded shall be abraded in an approved manner that will expose sound aggregate uniformly without damaging the concrete. Laitance and loose particles shall be removed. Surfaces shall be thoroughly washed and shall be moist but without free water when concrete is placed.

3.1.3 Vapor Barrier

Vapor barrier shall be provided beneath the interior on-grade concrete floor slabs. The greatest widths and lengths practicable shall be used to eliminate joints wherever possible. Joints shall be lapped a minimum of 12 inches. Torn, punctured, or damaged vapor barrier material shall be removed and new vapor barrier shall be provided prior to placing concrete. For minor repairs, patches may be made using laps of at least 12 inches. Lapped joints shall be sealed and edges patched with pressure-sensitive adhesive or tape not less than 2 inches wide and compatible with the membrane. Vapor barrier shall be placed directly on underlying subgrade, base course, or capillary water barrier, unless it consists of crushed material or large granular material which could puncture the vapor barrier. In this case, the surface shall be choked with a light layer of sand, as approved, before placing the vapor barrier. A 2 inch layer of compacted, clean concrete sand (fine aggregate) shall be placed on top of the vapor barrier before placing concrete. Concrete placement shall be controlled so

as to prevent damage to the vapor barrier, or any covering sand.

3.1.4 Embedded Items

Before placement of concrete, care shall be taken to determine that all embedded items are firmly and securely fastened in place as indicated on the drawings, or required. Conduit and other embedded items shall be clean and free of oil and other foreign matter such as loose coatings or rust, paint, and scale. The embedding of wood in concrete will be permitted only when specifically authorized or directed. Voids in sleeves, inserts, and anchor slots shall be filled temporarily with readily removable materials to prevent the entry of concrete into voids. Welding shall not be performed on embedded metals within 1 feet of the surface of the concrete. Tack welding shall not be performed on or to embedded items.

3.2 CONCRETE PRODUCTION

3.2.1 Batching, Mixing, and Transporting Concrete

Concrete shall either be batched and mixed onsite or shall be furnished from a ready-mixed concrete plant. Ready-mixed concrete shall be batched, mixed, and transported in accordance with ASTM C 94, except as otherwise specified. Truck mixers, agitators, and nonagitating transporting units shall comply with NRMCA TMMB 100. Ready-mix plant equipment and facilities shall be certified in accordance with NRMCA QC 3. Approved batch tickets shall be furnished for each load of ready-mixed concrete. Site-mixed concrete shall conform to the following subparagraphs.

3.2.1.1 General

The batching plant shall be located or off site close to the project. The batching plant shall conform to the requirements of NRMCA CPMB 100 and as specified; however, rating plates attached to batch plant equipment are not required.

3.2.1.2 Batching Equipment

The batching controls shall be semiautomatic or automatic, as defined in NRMCA CPMB 100. A semiautomatic batching system shall be provided with interlocks such that the discharge device cannot be actuated until the indicated material is within the applicable tolerance. The batching system shall be equipped with accurate recorder or recorders that meet the requirements of NRMCA CPMB 100. The weight of water and admixtures shall be recorded if batched by weight. Separate bins or compartments shall be provided for each size group of aggregate and type of cementitious material, to prevent intermingling at any time. Aggregates shall be weighed either in separate weigh batchers with individual scales or, provided the smallest size is batched first, cumulatively in one weigh batcher on one scale. Aggregate shall not be weighed in the same batcher with cementitious material. If both portland cement and other cementitious material are used, they may be batched cumulatively, provided that the portland cement is batched first. Water may be measured by weight or volume. Water shall not be weighed or measured cumulatively with another ingredient. Filling and discharging valves for the water metering or batching system shall be so interlocked that the discharge valve cannot be opened before the filling valve is fully closed. Piping for water and for admixtures shall be free from leaks and shall be properly valved to prevent backflow or siphoning. Admixtures shall be furnished as a liquid of suitable concentration for easy control of dispensing. An adjustable,

accurate, mechanical device for measuring and dispensing each admixture shall be provided. Each admixture dispenser shall be interlocked with the batching and discharging operation of the water so that each admixture is separately batched and individually discharged automatically in a manner to obtain uniform distribution throughout the water as it is added to the batch in the specified mixing period. When use of truck mixers makes this requirement impractical, the admixture dispensers shall be interlocked with the sand batchers. Different admixtures shall not be combined prior to introduction in water and shall not be allowed to intermingle until in contact with the cement. Admixture dispensers shall have suitable devices to detect and indicate flow during dispensing or have a means for visual observation. The plant shall be arranged so as to facilitate the inspection of all operations at all times. Suitable facilities shall be provided for obtaining representative samples of aggregates from each bin or compartment, and for sampling and calibrating the dispensing of cementitious material, water, and admixtures. Filling ports for cementitious materials bins or silos shall be clearly marked with a permanent sign stating the contents.

3.2.1.3 Scales

The weighing equipment shall conform to the applicable requirements of CPMB Concrete Plant Standard, and of NIST HB 44, except that the accuracy shall be plus or minus 0.2 percent of scale capacity. The Contractor shall provide standard test weights and any other auxiliary equipment required for checking the operating performance of each scale or other measuring devices. The tests shall be made at the specified frequency in the presence of a Government inspector. The weighing equipment shall be arranged so that the plant operator can conveniently observe all dials or indicators.

3.2.1.4 Batching Tolerances

(A) Tolerances with Weighing Equipment

MATERIAL	PERCENT OF REQUIRED WEIGHT
Cementitious materials	0 to plus 2
Aggregate	plus or minus 2
Water	plus or minus 1
Chemical admixture	0 to plus 6

(B) Tolerances with Volumetric Equipment

For volumetric batching equipment used for water and admixtures, the following tolerances shall apply to the required volume of material being batched:

MATERIAL	PERCENT OF REQUIRED MATERIAL
Water:	plus or minus 1 percent
Chemical admixtures:	0 to plus 6 percent

3.2.1.5 Moisture Control

The plant shall be capable of ready adjustment to compensate for the

varying moisture content of the aggregates and to change the weights of the materials being batched.

3.2.1.6 Concrete Mixers

Mixers shall be stationary mixers. Mixers shall be capable of combining the materials into a uniform mixture and of discharging this mixture without segregation. The mixers shall not be charged in excess of the capacity recommended by the manufacturer. The mixers shall be operated at the drum or mixing blade speed designated by the manufacturer. The mixers shall be maintained in satisfactory operating condition, and the mixer drums shall be kept free of hardened concrete. Should any mixer at any time produce unsatisfactory results, its use shall be promptly discontinued until it is repaired.

3.2.1.7 Stationary Mixers

Concrete plant mixers shall be drum-type mixers of tilting, nontilting, horizontal-shaft, or vertical-shaft type, or shall be pug mill type and shall be provided with an acceptable device to lock the discharge mechanism until the required mixing time has elapsed. The mixing time and uniformity shall conform to all the requirements in ASTM C 94 applicable to central-mixed concrete.

3.3 TRANSPORTING CONCRETE TO PROJECT SITE

Concrete shall be transported to the placing site in truck mixers.

3.4 CONVEYING CONCRETE ON SITE

Concrete shall be conveyed from mixer or transporting unit to forms as rapidly as possible and within the time interval specified by methods which will prevent segregation or loss of ingredients using following equipment. Conveying equipment shall be cleaned before each placement.

3.4.1 Buckets

The interior hopper slope shall be not less than 58 degrees from the horizontal, the minimum dimension of the clear gate opening shall be at least 5 times the nominal maximum-size aggregate, and the area of the gate opening shall not be less than 2 square feet.The maximum dimension of the gate opening shall not be greater than twice the minimum dimension. The bucket gates shall be essentially grout tight when closed and may be manually, pneumatically, or hydraulically operated except that buckets larger than 2 cubic yardsshall not be manually operated. The design of the bucket shall provide means for positive regulation of the amount and rate of deposit of concrete in each dumping position.

3.4.2 Transfer Hoppers

Concrete may be charged into nonagitating hoppers for transfer to other conveying devices. Transfer hoppers shall be capable of receiving concrete directly from delivery vehicles and shall have conical-shaped discharge features. The transfer hopper shall be equipped with a hydraulically operated gate and with a means of external vibration to effect complete discharge. Concrete shall not be held in nonagitating transfer hoppers more than 30 minutes.

3.4.3 Trucks

Truck mixers operating at agitating speed or truck agitators used for transporting plant-mixed concrete shall conform to the requirements of ASTM C 94. Nonagitating equipment shall be used only for transporting plant-mixed concrete over a smooth road and when the hauling time is less than 15 minutes. Bodies of nonagitating equipment shall be smooth, watertight, metal containers specifically designed to transport concrete, shaped with rounded corners to minimize segregation, and equipped with gates that will permit positive control of the discharge of the concrete.

3.4.4 Chutes

When concrete can be placed directly from a truck mixer, agitator, or nonagitating equipment, the chutes normally attached to this equipment by the manufacturer may be used. A discharge deflector shall be used when required by the Contracting Officer. Separate chutes and other similar equipment will not be permitted for conveying concrete.

3.4.5 Belt Conveyors

Belt conveyors shall be designed and operated to assure a uniform flow of concrete from mixer to final place of deposit without segregation of ingredients or loss of mortar and shall be provided with positive means, such as discharge baffle or hopper , for preventing segregation of the concrete at the transfer points and the point of placing. Belt conveyors shall be constructed such that the idler spacing shall not exceed 36 inches. The belt speed shall be a minimum of 300 feet per minute and a maximum of 750 feet per minute. If concrete is to be placed through installed horizontal or sloping reinforcing bars, the conveyor shall discharge concrete into a pipe or elephant truck that is long enough to extend through the reinforcing bars.

3.4.6 Concrete Pumps

Concrete may be conveyed by positive displacement pump when approved. The pumping equipment shall be piston or squeeze pressure type; pneumatic placing equipment shall not be used. The pipeline shall be rigid steel pipe or heavy-duty flexible hose. The inside diameter of the pipe shall be at least 3 times the nominal maximum-size coarse aggregate in the concrete mixture to be pumped but not less than 4 inches. Aluminum pipe shall not be used.

3.5 PLACING CONCRETE

Mixed concrete shall be discharged within 1-1/2 hours or before the mixer drum has revolved 300 revolutions, whichever comes first after the introduction of the mixing water to the cement and aggregates. When the concrete temperature exceeds 85 degrees F, the time shall be reduced to 45 minutes. Concrete shall be placed within 15 minutes after it has been discharged from the transporting unit. Concrete shall be handled from mixer or transporting unit to forms in a continuous manner until the approved unit of operation is completed. Adequate scaffolding, ramps and walkways shall be provided so that personnel and equipment are not supported by in-place reinforcement. Placing will not be permitted when the sun, heat, wind, or limitations of facilities furnished by the Contractor prevent proper consolidation, finishing and curing. Sufficient placing capacity shall be provided so that concrete can be kept free of cold joints.

3.5.1 Depositing Concrete

Concrete shall be deposited as close as possible to its final position in the forms, and there shall be no vertical drop greater than 5 feet except where suitable equipment is provided to prevent segregation and where specifically authorized. Depositing of the concrete shall be so regulated that it will be effectively consolidated in horizontal layers not more than 12 inches thick, except that all slabs shall be placed in a single layer. Concrete to receive other construction shall be screeded to the proper level. Concrete shall be deposited continuously in one layer or in layers so that fresh concrete is deposited on in-place concrete that is still plastic. Fresh concrete shall not be deposited on concrete that has hardened sufficiently to cause formation of seams or planes of weakness within the section. Concrete that has surface dried, partially hardened, or contains foreign material shall not be used. When temporary spreaders are used in the forms, the spreaders shall be removed as their service becomes unnecessary. Concrete shall not be placed in slabs over columns and walls until concrete in columns and walls has been in-place at least two hours or until the concrete begins to lose its plasticity. Concrete for beams, girders, brackets, column capitals, haunches, and drop panels shall be placed at the same time as concrete for adjoining slabs.

3.5.2 Consolidation

Immediately after placing, each layer of concrete shall be consolidated by internal vibrators, except for slabs 4 inches thick or less. The vibrators shall at all times be adequate in effectiveness and number to properly consolidate the concrete; a spare vibrator shall be kept at the jobsite during all concrete placing operations. The vibrators shall have a frequency of not less than 10,000 vibrations per minute, an amplitude of at least 0.025 inch, and the head diameter shall be appropriate for the structural member and the concrete mixture being placed. Vibrators shall be inserted vertically at uniform spacing over the area of placement. The distance between insertions shall be approximately 1-1/2 times the radius of action of the vibrator so that the area being vibrated will overlap the adjacent just-vibrated area by a reasonable amount. The vibrator shall penetrate rapidly to the bottom of the layer and at least 6 inches into the preceding layer if there is such. Vibrator shall be held stationary until the concrete is consolidated and then vertically withdrawn slowly while operating. Form vibrators shall not be used unless specifically approved and unless forms are constructed to withstand their use. Vibrators shall not be used to move concrete within the forms. Slabs 4 inches and less in thickness shall be consolidated by properly designed vibrating screeds or other approved technique. Excessive vibration of lightweight concrete resulting in segration or flotation of coarse aggregate shall be prevented. Frequency and amplitude of vibrators shall be determined in accordance with COE CRD-C 521. Grate tampers ("jitterbugs") shall not be used.

3.5.3 Cold Weather Requirements

Special protection measures, approved by the Contracting Officer, shall be used if freezing temperatures are anticipated before the expiration of the specified curing period. The ambient temperature of the air where concrete is to be placed and the temperature of surfaces to receive concrete shall be not less than 40 degrees F. The temperature of the concrete when placed shall be not less than 50 degrees F nor more than 75 degrees F. Heating of the mixing water or aggregates will be required to regulate the concrete placing temperature. Materials entering the mixer shall be free from ice,

snow, or frozen lumps. Salt, chemicals or other materials shall not be incorporated in the concrete to prevent freezing. Upon written approval, an accelerating admixture conforming to ASTM C 494, Type C or E may be used, provided it contains no calcium chloride. Calcium chloride shall not be used.

3.5.4 Hot Weather Requirements

When the ambient temperature during concrete placing is expected to exceed 85 degrees F, the concrete shall be placed and finished with procedures previously submitted and as specified herein. The concrete temperature at time of delivery to the forms shall not exceed the temperature shown in the table below when measured in accordance with ASTM C 1064. Cooling of the mixing water or aggregates or placing concrete in the cooler part of the day may be required to obtain an adequate placing temperature. A retarder may be used, as approved, to facilitate placing and finishing. Steel forms and reinforcements shall be cooled as approved prior to concrete placement when steel temperatures are greater than 120 degrees F. Conveying and placing equipment shall be cooled if necessary to maintain proper concrete-placing temperature.

Maximum Allowable Concrete Placing Temperature

Relative Humidity, Percent, During Time of Concrete Placement	Maximum Allowable Concrete Temperature Degrees
Greater than 60	90 F
40-60	85 F
Less than 40	80 F

3.5.5 Prevention of Plastic Shrinkage Cracking

During hot weather with low humidity, and particularly with appreciable wind, as well as interior placements when space heaters produce low humidity, the Contractor shall be alert to the tendency for plastic shrinkage cracks to develop and shall institute measures to prevent this. Particular care shall be taken if plastic shrinkage cracking is potentially imminent and especially if it has developed during a previous placement. Periods of high potential for plastic shrinkage cracking can be anticipated by use of Fig. 2.1.5 of ACI 305R. In addition the concrete placement shall be further protected by erecting shades and windbreaks and by applying fog sprays of water, sprinkling, ponding or wet covering. Plastic shrinkage cracks that occur shall be filled by injection of epoxy resin as directed, after the concrete hardens. Plastic shrinkage cracks shall never be troweled over or filled with slurry.

3.5.6 Placing Concrete in Congested Areas

Special care shall be used to ensure complete filling of the forms, elimination of all voids, and complete consolidation of the concrete when placing concrete in areas congested with reinforcing bars, embedded items, waterstops and other tight spacing. An appropriate concrete mixture shall be used, and the nominal maximum size of aggregate (NMSA) shall meet the specified criteria when evaluated for the congested area. Vibrators with heads of a size appropriate for the clearances available shall be used, and the consolidation operation shall be closely supervised to ensure complete

and thorough consolidation at all points. Where necessary, splices of reinforcing bars shall be alternated to reduce congestion. Where two mats of closely spaced reinforcing are required, the bars in each mat shall be placed in matching alignment to reduce congestion. Reinforcing bars may be temporarily crowded to one side during concrete placement provided they are returned to exact required location before concrete placement and consolidation are completed.

3.5.7 Placing Flowable Concrete

If a plasticizing admixture conforming to ASTM C 1017 is used or if a Type F or G high range water reducing admixture is permitted to increase the slump, the concrete shall meet all requirements of paragraph GENERAL REQUIREMENTS in PART 1. Extreme care shall be used in conveying and placing the concrete to avoid segregation. Consolidation and finishing shall meet all requirements of paragraphs Placing Concrete, Finishing Formed Surfaces, and Finishing Unformed Surfaces. No relaxation of requirements to accommodate flowable concrete will be permitted.

3.6 JOINTS

Joints shall be located and constructed as indicated or approved. Joints not indicated on the drawings shall be located and constructed to minimize the impact on the strength of the structure. In general, such joints shall be located near the middle of the spans of supported slabs, beams, and girders unless a beam intersects a girder at this point, in which case the joint in the girder shall be offset a distance equal to twice the width of the beam. Joints in walls and columns shall be at the underside of floors, slabs, beams, or girders and at the tops of footings or floor slabs, unless otherwise approved. Joints shall be perpendicular to the main reinforcement. All reinforcement shall be continued across joints; except that reinforcement or other fixed metal items shall not be continuous through expansion joints, or through construction or contraction joints in slabs on grade. Reinforcement shall be 2 inches clear from each joint. Except where otherwise indicated, construction joints between interior slabs on grade and vertical surfaces shall consist of 30 pound asphalt-saturated felt, extending for the full depth of the slab. The perimeters of the slabs shall be free of fins, rough edges, spalling, or other unsightly appearance. Reservoir for sealant for construction and contraction joints in slabs shall be formed to the dimensions shown on the drawings by removing snap-out joint-forming inserts, by sawing sawable inserts, or by sawing to widen the top portion of sawed joints. Joints to be sealed shall be cleaned and sealed as indicated and in accordance with Section 07920 JOINT SEALANTS.

3.6.1 Construction Joints

For concrete other than slabs on grade, construction joints shall be located so that the unit of operation does not exceed 60 feet. Concrete shall be placed continuously so that each unit is monolithic in construction. Fresh concrete shall not be placed against adjacent hardened concrete until it is at least 24 hours old. Construction joints shall be located as indicated or approved. Where concrete work is interrupted by weather, end of work shift or other similar type of delay, location and type of construction joint shall be subject to approval of the Contracting Officer. Unless otherwise indicated and except for slabs on grade, reinforcing steel shall extend through construction joints. Construction joints in slabs on grade shall be keyed or doweled as shown. Concrete columns, walls, or piers shall be in place at least 2 hours, or until the

concrete begins to lose its plasticity, before placing concrete for beams, girders, or slabs thereon. In walls having door or window openings, lifts shall terminate at the top and bottom of the opening. Other lifts shall terminate at such levels as to conform to structural requirements or architectural details. Where horizontal construction joints in walls or columns are required, a strip of 1 inchsquare-edge lumber, bevelled and oiled to facilitate removal, shall be tacked to the inside of the forms at the construction joint. Concrete shall be placed to a point 1 inch above the underside of the strip. The strip shall be removed 1 hour after the concrete has been placed, and any irregularities in the joint line shall be leveled off with a wood float, and all laitance shall be removed. Prior to placing additional concrete, horizontal construction joints shall be prepared as specified in paragraph Previously Placed Concrete.

3.6.2 Contraction Joints in Slabs on Grade

Contraction joints shall be located and detailed as shown on the drawings. Contraction Joints shall be produced by forming a weakened plane in the concrete slab by use of rigid inserts impressed in the concrete during placing operations use of snap-out plastic joint forming inserts or sawing a continuous slot with a concrete saw. Regardless of method used to produce the weakened plane, it shall be 1/4 the depth of the slab thickness and between 1/8 and 3/16 inch wide. For saw-cut joints, cutting shall be timed properly with the set of the concrete. Cutting shall be started as soon as the concrete has hardened sufficiently to prevent ravelling of the edges of the saw cut. Cutting shall be completed before shrinkage stresses become sufficient to produce cracking. Reservoir for joint sealant shall be formed as previously specified.

3.6.3 Expansion Joints

Installation of expansion joints and sealing of these joints shall conform to the requirements of Section 03150 EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS and Section 07920 JOINT SEALANTS.

3.6.4 Waterstops

Waterstops shall be installed in conformance with the locations and details shown on the drawings using materials and procedures specified in Section 03150 EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS.

3.6.5 Dowels and Tie Bars

Dowels and tie bars shall be installed at the locations shown on the drawings and to the details shown, using materials and procedures specified in Section 03200 CONCRETE REINFORCEMENT and herein. Conventional smooth "paving" dowels shall be installed in slabs using approved methods to hold the dowel in place during concreting within a maximum alignment tolerance of 1/8 inch in 12 inches. "Structural" type deformed bar dowels, or tie bars, shall be installed to meet the specified tolerances. Care shall be taken during placing adjacent to and around dowels and tie bars to ensure there is no displacement of the dowel or tie bar and that the concrete completely embeds the dowel or tie bar and is thoroughly consolidated.

3.7 FINISHING FORMED SURFACES

Forms, form materials, and form construction are specified in Section 03100 STRUCTURAL CONCRETE FORMWORK. Finishing of formed surfaces shall be as specified herein. Unless another type of architectural or special finish

is specified, surfaces shall be left with the texture imparted by the forms except that defective surfaces shall be repaired. Unless painting of surfaces is required, uniform color of the concrete shall be maintained by use of only one mixture without changes in materials or proportions for any structure or portion of structure that requires a Class A or B finish. Except for major defects, as defined hereinafter, surface defects shall be repaired as specified herein within 24 hours after forms are removed. Repairs of the so-called "plaster-type" will not be permitted in any location. Tolerances of formed surfaces shall conform to the requirements of ACI 117. These tolerances apply to the finished concrete surface, not to the forms themselves; forms shall be set true to line and grade. Form tie holes requiring repair and other defects whose depth is at least as great as their surface diameter shall be repaired as specified in paragraph Damp-Pack Mortar Repair. Defects whose surface diameter is greater than their depth shall be repaired as specified in paragraph Repair of Major Defects. Repairs shall be finished flush with adjacent surfaces and with the same surface texture. The cement used for all repairs shall be a blend of job cement with white cement proportioned so that the final color after curing and aging will be the same as the adjacent concrete. Concrete with excessive honeycomb, or other defects which affect the strength of the member, will be rejected. Repairs shall be demonstrated to be acceptable and free from cracks or loose or drummy areas at the completion of the contract and, for Class A and B Finishes, shall be inconspicuous. Repairs not meeting these requirements will be rejected and shall be replaced.

3.7.1 Class A Finish and Class B Finish

Class A finish is required in the following areas, interior surfaces exposed to view. Class B finish is required in the following areas, exterior surfaces exposed to view. Fins, ravelings, and loose material shall be removed, all surface defects over 1/2 inch in diameter or more than 1/2 inch deep, shall be repaired and, except as otherwise indicated or as specified in Section 03100 STRUCTURAL CONCRETE FORMWORK, holes left by removal of form ties shall be reamed and filled. Defects more than 1/2 inch in diameter shall be cut back to sound concrete, but in all cases at least 1 inch deep. The Contractor shall prepare a sample panel for approval (as specified in PART 1) before commencing repair, showing that the surface texture and color match will be attained. Metal tools shall not be used to finish repairs in Class A surfaces.

3.7.2 Class C and Class D Finish

Class C finish is required in the following areas, surfaces not exposed to view unless note otherwise. Fins, ravelings, and loose material shall be removed, and, except as otherwise indicated or as specified in Section 03100 STRUCTURAL CONCRETE FORMWORK, holes left by removal of form ties shall be reamed and filled. Honeycomb and other defects more than 1/2 inch deep or more than 2 inches in diameter shall be repaired. Defects more than 2 inches in diameter shall be cut back to sound concrete, but in all cases at least 1 inch deep.

3.8 REPAIRS

3.8.1 Damp-Pack Mortar Repair

Form tie holes requiring repair and other defects whose depth is at least as great as their surface diameter but not over 4 inchesshall be repaired by the damp-pack mortar method. Form tie holes shall be reamed and other similar defects shall be cut out to sound concrete. The void shall then be

thoroughly cleaned, thoroughly wetted, brush-coated with a thin coat of neat cement grout and filled with mortar. Mortar shall be a stiff mix of 1 part portland cement to 2 parts fine aggregate passing the No. 16 mesh sieve, and minimum amount of water. Only sufficient water shall be used to produce a mortar which, when used, will stick together on being molded into a ball by a slight pressure of the hands and will not exude water but will leave the hands damp. Mortar shall be mixed and allowed to stand for 30 to 45 minutes before use with remixing performed immediately prior to use. Mortar shall be thoroughly tamped in place in thin layers using a hammer and hardwood block. Holes passing entirely through walls shall be completely filled from the inside face by forcing mortar through to the outside face. All holes shall be packed full. Damp-pack repairs shall be moist cured for at least 48 hours.

3.8.2 Repair of Major Defects

Major defects will be considered to be those more than 1/2 inch deep or, for Class A and B finishes, more than 1/2 inch in diameter and, for Class C and D finishes, more than 2 inches in diameter. Also included are any defects of any kind whose depth is over 4 inches or whose surface diameter is greater than their depth. Major defects shall be repaired as specified below.

3.8.2.1 Surface Application of Mortar Repair

Defective concrete shall be removed, and removal shall extend into completely sound concrete. Approved equipment and procedures which will not cause cracking or microcracking of the sound concrete shall be used. If reinforcement is encountered, concrete shall be removed so as to expose the reinforcement for at least 2 inches on all sides. All such defective areas greater than 12 square inchesshall be outlined by saw cuts at least 1 inch deep. Defective areas less than 12 square inches shall be outlined by a 1 inch deep cut with a core drill in lieu of sawing. All saw cuts shall be straight lines in a rectangular pattern in line with the formwork panels. After concrete removal, the surface shall be thoroughly cleaned by high pressure washing to remove all loose material. Surfaces shall be kept continually saturated for the first 12 of the 24 hours immediately before placing mortar and shall be damp but not wet at the time of commencing mortar placement. The Contractor, at his option, may use either hand-placed mortar or mortar placed with a mortar gun. If hand-placed mortar is used, the edges of the cut shall be perpendicular to the surface of the concrete. The prepared area shall be brush-coated with a thin coat of neat cement grout. The repair shall then be made using a stiff mortar, preshrunk by allowing the mixed mortar to stand for 30 to 45 minutes and then remixed, thoroughly tamped into place in thin layers. If hand-placed mortar is used, the Contractor shall test each repair area for drumminess by firm tapping with a hammer and shall inspect for cracks, both in the presence of the Contracting Officer's representative, immediately before completion of the contract, and shall replace any showing drumminess or cracking. If mortar placed with a mortar gun is used, the gun shall be a small compressed air-operated gun to which the mortar is slowly hand fed and which applies the mortar to the surface as a high-pressure stream, as approved. Repairs made using shotcrete equipment will not be accepted. The mortar used shall be the same mortar as specified for damp-pack mortar repair. If gun-placed mortar is used, the edges of the cut shall be beveled toward the center at a slope of 1:1. All surface applied mortar repairs shall be continuously moist cured for at least 7 days. Moist curing shall consist of several layers of saturated burlap applied to the surface immediately after placement is complete and covered with

polyethylene sheeting, all held closely in place by a sheet of plywood or similar material rigidly braced against it. Burlap shall be kept continually wet.

3.9 FINISHING UNFORMED SURFACES

The finish of all unformed surfaces shall meet the requirements of paragraph Tolerances in PART 1, when tested as specified herein.

3.9.1 General

The ambient temperature of spaces adjacent to unformed surfaces being finished and of the base on which concrete will be placed shall be not less than 50 degrees F. In hot weather all requirements of paragraphs Hot Weather Requirements and Prevention of Plastic Shrinkage Cracking shall be met. Unformed surfaces that are not to be covered by additional concrete or backfill shall have a float finish, with additional finishing as specified below, and shall be true to the elevation shown on the drawings. Surfaces to receive additional concrete or backfill shall be brought to the elevation shown on the drawings, properly consolidated, and left true and regular. Unless otherwise shown on the drawings, exterior surfaces shall be sloped for drainage, as directed. Where drains are provided, interior floors shall be evenly sloped to the drains. Joints shall be carefully made with a jointing or edging tool. The finished surfaces shall be protected from stains or abrasions. Grate tampers or "jitterbugs" shall not be used for any surfaces. The dusting of surfaces with dry cement or other materials or the addition of any water during finishing shall not be permitted. If bleedwater is present prior to finishing, the excess water shall be carefully dragged off or removed by absorption with porous materials such as burlap. During finishing operations, extreme care shall be taken to prevent over finishing or working water into the surface; this can cause "crazing" (surface shrinkage cracks which appear after hardening) of the surface. Any slabs with surfaces which exhibit significant crazing shall be removed and replaced. During finishing operations, surfaces shall be checked with a 10 foot straightedge, applied in both directions at regular intervals while the concrete is still plastic, to detect high or low areas.

3.9.2 Floated Finish

Slabs to receive more than a rough slab finish shall next be given a wood float finish. The following areas mechanical, electrical and communication rooms shall be given only a float finish. The screeding shall be followed immediately by darbying or bull floating before bleeding water is present, to bring the surface to a true, even plane. Then, after the concrete has stiffened so that it will withstand a man's weight without imprint of more than 1/4 inch and the water sheen has disappeared, it shall be floated to a true and even plane free of ridges. Floating shall be performed by use of suitable hand floats or power driven equipment. Sufficient pressure shall be used on the floats to bring a film of moisture to the surface. Hand floats shall be made of wood, magnesium, or aluminum. Lightweight concrete or concrete that exhibits stickiness shall be floated with a magnesium float. Care shall be taken to prevent over-finishing or incorporating water into the surface.

3.9.3 Troweled Finish

The following areas all areas except in mechanical, electrical and communication rooms shall be given a trowel finish. After floating is

complete and after the surface moisture has disappeared, unformed surfaces shall be steel-troweled to a smooth, even, dense finish, free from blemishes including trowel marks. In lieu of hand finishing, an approved power finishing machine may be used in accordance with the directions of the machine manufacturer. Additional trowelings shall be performed, either by hand or machine until the surface has been troweled 2 times, with waiting period between each. Care shall be taken to prevent blistering and if such occurs, troweling shall immediately be stopped and operations and surfaces corrected. A final hard steel troweling shall be done by hand, with the trowel tipped, and using hard pressure, when the surface is at a point that the trowel will produce a ringing sound. The finished surface shall be thoroughly consolidated and shall be essentially free of trowel marks and be uniform in texture and appearance. The concrete mixture used for troweled finished areas shall be adjusted, if necessary, in order to provide sufficient fines (cementitious material and fine sand) to finish properly.

3.10 EXTERIOR SLAB AND RELATED ITEMS

3.10.1 Pavements

Pavements shall be constructed where shown on the drawings. After forms are set and underlying material prepared as specified, the concrete shall be placed uniformly throughout the area and thoroughly vibrated. As soon as placed and vibrated, the concrete shall be struck off and screeded to the crown and cross section and to such elevation above grade that when consolidated and finished, the surface of the pavement will be at the required elevation. The entire surface shall be tamped with the strike off, or consolidated with a vibrating screed, and this operation continued until the required compaction and reduction of internal and surface voids are accomplished. Care shall be taken to prevent bringing excess paste to the surface. Immediately following the final consolidation of the surface, the pavement shall be floated longitudinally from bridges resting on the side forms and spanning but not touching the concrete. If necessary, additional concrete shall be placed and screeded, and the float operated until a satisfactory surface has been produced. The floating operation shall be advanced not more than half the length of the float and then continued over the new and previously floated surfaces. After finishing is completed but while the concrete is still plastic, minor irregularities and score marks in the pavement surface shall be eliminated by means of long-handled cutting straightedges. Straightedges shall be 12 feet in length and shall be operated from the sides of the pavement and from bridges. A straightedge operated from the side of the pavement shall be equipped with a handle 3 feet longer than one-half the width of the pavement. The surface shall then be tested for trueness with a 12 foot straightedge held in successive positions parallel and at right angles to the center line of the pavement, and the whole area covered as necessary to detect variations. The straightedge shall be advanced along the pavement in successive stages of not more than one-half the length of the straightedge. Depressions shall be immediately filled with freshly mixed concrete, struck off, consolidated, and refinished. Projections above the required elevation shall also be struck off and refinished. The straightedge testing and finishing shall continue until the entire surface of the concrete is true. Before the surface sheen has disappeared and well before the concrete becomes nonplastic, the surface of the pavement shall be given a nonslip sandy surface texture by use of a burlap drag. A strip of clean, wet burlap from 3 to 5 feet wide and 2 feet longer than the pavement width shall be carefully pulled across the surface. Edges and joints shall be rounded with an edger having a radius of 1/8 inch. Curing

shall be as specified.

3.10.2 Sidewalks

Concrete shall be 4 inches minimum thickness. Contraction joints shall be provided at 5 feet spaces unless otherwise indicated. Contraction joints shall be cut 1 inch deep with a jointing tool after the surface has been finished. Transverse expansion joints 1/2 inch thick shall be provided at changes in direction and where sidewalk abuts curbs, steps, rigid pavement, or other similar structures. Sidewalks shall be given a lightly broomed finish. A transverse slope of 1/4 inch per foot shall be provided, unless otherwise indicated. Variations in cross section shall be limited to 1/4 inch in 5 feet.

3.10.3 Curbs and Gutters

Concrete shall be formed, placed, and finished by hand using a properly shaped "mule" or constructed using a slipform machine specially designed for this work. Contraction joints shall be cut 3 inches deep with a jointing tool after the surface has been finished. Expansion joints (1/2 inch wide) shall be provided at 100 feetmaximum spacing unless otherwise indicated. Exposed surfaces shall be finished using a stiff bristled brush.

3.10.4 Pits and Trenches

Pits and trenches shall be constructed as indicated on the drawings. Bottoms and walls shall be placed monolithically or waterstops and keys, shall be provided as approved.

3.11 CURING AND PROTECTION

3.11.1 General

Concrete shall be cured by an approved method for the period of time given below:

All other concrete	7 days

Immediately after placement, concrete shall be protected from premature drying, extremes in temperatures, rapid temperature change, mechanical injury and damage from rain and flowing water for the duration of the curing period. Air and forms in contact with concrete shall be maintained at a temperature above 50 degrees F for the first 3 days and at a temperature above 32 degrees F for the remainder of the specified curing period. Exhaust fumes from combustion heating units shall be vented to the outside of the enclosure, and heaters and ducts shall be placed and directed so as not to cause areas of overheating and drying of concrete surfaces or to create fire hazards. Materials and equipment needed for adequate curing and protection shall be available and at the site prior to placing concrete. No fire or excessive heat, including welding, shall be permitted near or in direct contact with the concrete at any time. Except as otherwise permitted by paragraph Membrane Forming Curing Compounds, moist curing shall be provided for any areas to receive floor hardener, any paint or other applied coating, or to which other concrete is to be bonded. Concrete containing silica fume shall be initially cured by fog misting during finishing, followed immediately by continuous moist curing. Except for plastic coated burlap, impervious sheeting alone shall not be used for curing.

3.11.2 Moist Curing

Concrete to be moist-cured shall be maintained continuously wet for the entire curing period, commencing immediately after finishing. If water or curing materials used stain or discolor concrete surfaces which are to be permanently exposed, the concrete surfaces shall be cleaned as approved. When wooden forms are left in place during curing, they shall be kept wet at all times. If steel forms are used in hot weather, nonsupporting vertical forms shall be broken loose from the concrete soon after the concrete hardens and curing water continually applied in this void. If the forms are removed before the end of the curing period, curing shall be carried out as on unformed surfaces, using suitable materials. Surfaces shall be cured by ponding, by continuous sprinkling, by continuously saturated burlap or cotton mats, or by continuously saturated plastic coated burlap. Burlap and mats shall be clean and free from any contamination and shall be completely saturated before being placed on the concrete. The Contractor shall have an approved work system to ensure that moist curing is continuous 24 hours per day.

3.11.3 Ponding or Immersion

Concrete shall be continually immersed throughout the curing period. Water shall not be more than 20 degrees F less than the temperature of the concrete.

3.11.4 Cold Weather Curing and Protection

When the daily ambient low temperature is less than 32 degrees F the temperature of the concrete shall be maintained above 40 degrees F for the first seven days after placing. During the period of protection removal, the air temperature adjacent to the concrete surfaces shall be controlled so that concrete near the surface will not be subjected to a temperature differential of more than 25 degrees F as determined by suitable temperature measuring devices furnished by the Government, as required, and installed adjacent to the concrete surface and 2 inches inside the surface of the concrete. The installation of the thermometers shall be made by the Contractor as directed.

3.12 SETTING BASE PLATES AND BEARING PLATES

After being properly positioned, column base plates, bearing plates for beams and similar structural members, and machinery and equipment base plates shall be set to the proper line and elevation with damp-pack bedding mortar, except where nonshrink grout is indicated. The thickness of the mortar or grout shall be approximately 1/24 the width of the plate, but not less than 3/4 inch. Concrete and metal surfaces in contact with grout shall be clean and free of oil and grease, and concrete surfaces in contact with grout shall be damp and free of laitance when grout is placed. Nonshrink grout shall be used for column base plates and equpment bearing plates.

3.12.1 Damp-Pack Bedding Mortar

Damp-pack bedding mortar shall consist of 1 part cement and 2-1/2 parts fine aggregate having water content such that a mass of mortar tightly squeezed in the hand will retain its shape but will crumble when disturbed. The space between the top of the concrete and bottom of the bearing plate or base shall be packed with the bedding mortar by tamping or ramming with a bar or rod until it is completely filled.

3.12.2 Nonshrink Grout

Nonshrink grout shall be a ready-mixed material requiring only the addition of water. Water content shall be the minimum that will provide a flowable mixture and completely fill the space to be grouted without segregation, bleeding, or reduction of strength.

3.12.2.1 Mixing and Placing of Nonshrink Grout

Mixing and placing shall be in conformance with the material manufacturer's instructions and as specified therein. Ingredients shall be thoroughly dry-mixed before adding water. After adding water, the batch shall be mixed for 3 minutes. Batches shall be of size to allow continuous placement of freshly mixed grout. Grout not used within 30 minutes after mixing shall be discarded. The space between the top of the concrete or machinery-bearing surface and the plate shall be filled solid with the grout. Forms shall be of wood or other equally suitable material for completely retaining the grout on all sides and on top and shall be removed after the grout has set. The placed grout shall be carefully worked by rodding or other means to eliminate voids; however, overworking and breakdown of the initial set shall be avoided. Grout shall not be retempered or subjected to vibration from any source. Where clearances are unusually small, placement shall be under pressure with a grout pump. Temperature of the grout, and of surfaces receiving the grout, shall be maintained at 65 to 85 degrees F until after setting.

3.12.2.2 Treatment of Exposed Surfaces

For metal-oxidizing nonshrink grout, exposed surfaces shall be cut back 1 inch and immediately covered with a parge coat of mortar consisting of 1 part portland cement and 2-1/2 parts fine aggregate by weight, with sufficient water to make a plastic mixture. The parge coat shall have a smooth finish. For other mortars or grouts, exposed surfaces shall have a smooth-dense finish and be left untreated. Curing shall comply with paragraph CURING AND PROTECTION.

3.13 TESTING AND INSPECTION FOR CONTRACTOR QUALITY CONTROL

The Contractor shall perform the inspection and tests described below and, based upon the results of these inspections and tests, shall take the action required and shall submit specified reports. When, in the opinion of the Contracting Officer, the concreting operation is out of control, concrete placement shall cease and the operation shall be corrected. The laboratory performing the tests shall be onsite and shall conform with ASTM C 1077. Materials may be subjected to check testing by the Government from samples obtained at the manufacturer, at transfer points, or at the project site. The Government will inspect the laboratory, equipment, and test procedures prior to start of concreting operations and at least once per 500 yd thereafter for conformance with ASTM C 1077.

3.13.1 Grading and Corrective Action

3.13.1.1 Fine Aggregate

At least once during each shift when the concrete plant is operating, there shall be one sieve analysis and fineness modulus determination in accordance with ASTM C 136 and COE CRD-C 104 for the fine aggregate or for each fine aggregate if it is batched in more than one size or

classification. The location at which samples are taken may be selected by the Contractor as the most advantageous for control. However, the Contractor is responsible for delivering fine aggregate to the mixer within specification limits. When the amount passing on any sieve is outside the specification limits, the fine aggregate shall be immediately resampled and retested. If there is another failure on any sieve, the fact shall immediately reported to the Contracting Officer, concreting shall be stopped, and immediate steps taken to correct the grading.

3.13.1.2 Coarse Aggregate

At least once during each shift in which the concrete plant is operating, there shall be a sieve analysis in accordance with ASTM C 136 for each size of coarse aggregate. The location at which samples are taken may be selected by the Contractor as the most advantageous for production control. However, the Contractor shall be responsible for delivering the aggregate to the mixer within specification limits. A test record of samples of aggregate taken at the same locations shall show the results of the current test as well as the average results of the five most recent tests including the current test. The Contractor may adopt limits for control coarser than the specification limits for samples taken other than as delivered to the mixer to allow for degradation during handling. When the amount passing any sieve is outside the specification limits, the coarse aggregate shall be immediately resampled and retested. If the second sample fails on any sieve, that fact shall be reported to the Contracting Officer. Where two consecutive averages of 5 tests are outside specification limits, the operation shall be considered out of control and shall be reported to the Contracting Officer. Concreting shall be stopped and immediate steps shall be taken to correct the grading.

3.13.2 Quality of Aggregates

Thirty days prior to the start of concrete placement, the Contractor shall perform all tests for aggregate quality required by ASTM C 33. In addition, after the start of concrete placement, the Contractor shall perform tests for aggregate quality at least every three months, and when the source of aggregate or aggregate quality changes. Samples tested after the start of concrete placement shall be taken immediately prior to entering the concrete mixer.

3.13.3 Scales, Batching and Recording

The accuracy of the scales shall be checked by test weights prior to start of concrete operations and at least once every three months. Such tests shall also be made as directed whenever there are variations in properties of the fresh concrete that could result from batching errors. Once a week the accuracy of each batching and recording device shall be checked during a weighing operation by noting and recording the required weight, recorded weight, and the actual weight batched. At the same time, the Contractor shall test and ensure that the devices for dispensing admixtures are operating properly and accurately. When either the weighing accuracy or batching accuracy does not comply with specification requirements, the plant shall not be operated until necessary adjustments or repairs have been made. Discrepancies in recording accuracies shall be corrected immediately.

3.13.4 Batch-Plant Control

The measurement of concrete materials including cementitious materials,

each size of aggregate, water, and admixtures shall be continuously controlled. The aggregate weights and amount of added water shall be adjusted as necessary to compensate for free moisture in the aggregates. The amount of air-entraining agent shall be adjusted to control air content within specified limits. A report shall be prepared indicating type and source of cement used, type and source of pozzolan or slag used, amount and source of admixtures used, aggregate source, the required aggregate and water weights per cubic yard, amount of water as free moisture in each size of aggregate, and the batch aggregate and water weights per cubic yard for each class of concrete batched during each day's plant operation.

3.13.5 Concrete Mixture

a. Air Content Testing. Air content tests shall be made when test specimens are fabricated. In addition, at least two tests for air content shall be made on randomly selected batches of each separate concrete mixture produced during each 8-hour period of concrete production. Additional tests shall be made when excessive variation in workability is reported by the placing foreman or Government inspector. Tests shall be made in accordance with ASTM C 231 for normal weight concrete and ASTM C 173 for lightweight concrete. Test results shall be plotted on control charts which shall at all times be readily available to the Government and shall be submitted weekly. Copies of the current control charts shall be kept in the field by testing crews and results plotted as tests are made. When a single test result reaches either the upper or lower action limit, a second test shall immediately be made. The results of the two tests shall be averaged and this average used as the air content of the batch to plot on both the air content and the control chart for range, and for determining need for any remedial action. The result of each test, or average as noted in the previous sentence, shall be plotted on a separate control chart for each mixture on which an "average line" is set at the midpoint of the specified air content range from paragraph Air Entrainment. An upper warning limit and a lower warning limit line shall be set 1.0 percentage point above and below the average line, respectively. An upper action limit and a lower action limit line shall be set 1.5 percentage points above and below the average line, respectively. The range between each two consecutive tests shall be plotted on a secondary control chart for range where an upper warning limit is set at 2.0 percentage points and an upper action limit is set at 3.0 percentage points. Samples for air content may be taken at the mixer, however, the Contractor is responsible for delivering the concrete to the placement site at the stipulated air content. If the Contractor's materials or transportation methods cause air content loss between the mixer and the placement, correlation samples shall be taken at the placement site as required by the Contracting Officer, and the air content at the mixer controlled as directed.

b. Air Content Corrective Action. Whenever points on the control chart for percent air reach either warning limit, an adjustment shall immediately be made in the amount of air-entraining admixture batched. As soon as practical after each adjustment, another test shall be made to verify the result of the adjustment. Whenever a point on the secondary control chart for range reaches the warning limit, the admixture dispenser shall be recalibrated to ensure that it is operating accurately and with good

reproducibility. Whenever a point on either control chart reaches an action limit line, the air content shall be considered out of control and the concreting operation shall immediately be halted until the air content is under control. Additional air content tests shall be made when concreting is restarted.

c. Slump Testing. In addition to slump tests which shall be made when test specimens are fabricated, at least four slump tests shall be made on randomly selected batches in accordance with ASTM C 143 for each separate concrete mixture produced during each 8-hour or less period of concrete production each day. Also, additional tests shall be made when excessive variation in workability is reported by the placing foreman or Government inspector. Test results shall be plotted on control charts which shall at all times be readily available to the Government and shall be submitted weekly. Copies of the current control charts shall be kept in the field by testing crews and results plotted as tests are made. When a single slump test reaches or goes beyond either the upper or lower action limit, a second test shall immediately be made. The results of the two tests shall be averaged and this average used as the slump of the batch to plot on both the control charts for slump and the chart for range, and for determining need for any remedial action. Limits shall be set on separate control charts for slump for each type of mixture. The upper warning limit shall be set at 1/2 inch below the maximum allowable slump specified in paragraph Slump in PART 1 for each type of concrete and an upper action limit line and lower action limit line shall be set at the maximum and minimum allowable slumps, respectively, as specified in the same paragraph. The range between each consecutive slump test for each type of mixture shall be plotted on a single control chart for range on which an upper action limit is set at 2 inches. Samples for slump shall be taken at the mixer. However, the Contractor is responsible for delivering the concrete to the placement site at the stipulated slump. If the Contractor's materials or transportation methods cause slump loss between the mixer and the placement, correlation samples shall be taken at the placement site as required by the Contracting Officer, and the slump at the mixer controlled as directed.

d. Slump Corrective Action. Whenever points on the control charts for slump reach the upper warning limit, an adjustment shall immediately be made in the batch weights of water and fine aggregate. The adjustments are to be made so that the total water content does not exceed that amount allowed by the maximum w/c ratio specified, based on aggregates which are in a saturated surface dry condition. When a single slump reaches the upper or lower action limit, no further concrete shall be delivered to the placing site until proper adjustments have been made. Immediately after each adjustment, another test shall be made to verify the correctness of the adjustment. Whenever two consecutive individual slump tests, made during a period when there was no adjustment of batch weights, produce a point on the control chart for range at or above the upper action limit, the concreting operation shall immediately be halted, and the Contractor shall take appropriate steps to bring the slump under control. Additional slump tests shall be made as directed.

e. Temperature. The temperature of the concrete shall be measured

when compressive strength specimens are fabricated. Measurement shall be in accordance with ASTM C 1064. The temperature shall be reported along with the compressive strength data.

f. Strength Specimens. At least one set of test specimens shall be made, for compressive or flexural strength as appropriate, on each different concrete mixture placed during the day for each 500 cubic yards or portion thereof of that concrete mixture placed each day. Additional sets of test specimens shall be made, as directed by the Contracting Officer, when the mixture proportions are changed or when low strengths have been detected. A truly random (not haphazard) sampling plan shall be developed by the Contractor and approved by the Contracting Officer prior to the start of construction. The plan shall assure that sampling is done in a completely random and unbiased manner. A set of test specimens for concrete with a 28-day specified strength per paragraph Strength Requirements in PART 1 shall consist of four specimens, two to be tested at 7 days and two at 28 days. A set of test specimens for concrete with a 90-day strength per the same paragraph shall consist of six specimens, two tested at 7 days, two at 28 days, and two at 90 days. Test specimens shall be molded and cured in accordance with ASTM C 31 and tested in accordance with ASTM C 39 for test cylinders and ASTM C 78 for test beams. Results of all strength tests shall be reported immediately to the Contracting Officer. Quality control charts shall be kept for individual strength "tests", ("test" as defined in paragraph Strength Requirements in PART 1) moving average of last 3 "tests" for strength, and moving average for range for the last 3 "tests" for each mixture. The charts shall be similar to those found in ACI 214.3R.

3.13.6 Inspection Before Placing

Foundations, construction joints, forms, and embedded items shall be inspected by the Contractor in sufficient time prior to each concrete placement in order to certify to the Contracting Officer that they are ready to receive concrete. The results of each inspection shall be reported in writing.

3.13.7 Placing

The placing foreman shall supervise placing operations, shall determine that the correct quality of concrete or grout is placed in each location as specified and as directed by the Contracting Officer, and shall be responsible for measuring and recording concrete temperatures and ambient temperature hourly during placing operations, weather conditions, time of placement, volume placed, and method of placement. The placing foreman shall not permit batching and placing to begin until it has been verified that an adequate number of vibrators in working order and with competent operators are available. Placing shall not be continued if any pile of concrete is inadequately consolidated. If any batch of concrete fails to meet the temperature requirements, immediate steps shall be taken to improve temperature controls.

3.13.8 Vibrators

The frequency and amplitude of each vibrator shall be determined in accordance with COE CRD-C 521 prior to initial use and at least once a month when concrete is being placed. Additional tests shall be made as

directed when a vibrator does not appear to be adequately consolidating the concrete. The frequency shall be determined while the vibrator is operating in concrete with the tachometer being held against the upper end of the vibrator head while almost submerged and just before the vibrator is withdrawn from the concrete. The amplitude shall be determined with the head vibrating in air. Two measurements shall be taken, one near the tip and another near the upper end of the vibrator head, and these results averaged. The make, model, type, and size of the vibrator and frequency and amplitude results shall be reported in writing. Any vibrator not meeting the requirements of paragraph Consolidation, shall be immediately removed from service and repaired or replaced.

3.13.9 Curing Inspection

a. Moist Curing Inspections. At least once each shift, and not less than twice per day on both work and non-work days, an inspection shall be made of all areas subject to moist curing. The surface moisture condition shall be noted and recorded.

b. Moist Curing Corrective Action. When a daily inspection report lists an area of inadequate curing, immediate corrective action shall be taken, and the required curing period for those areas shall be extended by 1 day.

3.13.10 Cold-Weather Protection

At least once each shift and once per day on non-work days, an inspection shall be made of all areas subject to cold-weather protection. Any deficiencies shall be noted, corrected, and reported.

3.13.11 Mixer Uniformity

a. Stationary Mixers. Prior to the start of concrete placing and once every 6 months when concrete is being placed, or once for every 75,000 cubic yards of concrete placed, whichever results in the shortest time interval, uniformity of concrete mixing shall be determined in accordance with ASTM C 94.

b. Truck Mixers. Prior to the start of concrete placing and at least once every 6 months when concrete is being placed, uniformity of concrete mixing shall be determined in accordance with ASTM C 94. The truck mixers shall be selected randomly for testing. When satisfactory performance is found in one truck mixer, the performance of mixers of substantially the same design and condition of the blades may be regarded as satisfactory.

c. Mixer Uniformity Corrective Action. When a mixer fails to meet mixer uniformity requirements, either the mixing time shall be increased, batching sequence changed, batch size reduced, or adjustments shall be made to the mixer until compliance is achieved.

3.13.12 Reports

All results of tests or inspections conducted shall be reported informally as they are completed and in writing daily. A weekly report shall be prepared for the updating of control charts covering the entire period from the start of the construction season through the current week. During periods of cold-weather protection, reports of pertinent temperatures shall

be made daily. These requirements do not relieve the Contractor of the obligation to report certain failures immediately as required in preceding paragraphs. Such reports of failures and the action taken shall be confirmed in writing in the routine reports. The Contracting Officer has the right to examine all contractor quality control records.

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SECTION 04200

MASONRY
09/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ACI INTERNATIONAL (ACI)

ACI 530/530.1	(2000) Building Code Requirements for Masonry Structures
ACI SP-66	(1994) ACI Detailing Manual

ASTM INTERNATIONAL (ASTM)

ASTM A 82	(2001) Steel Wire, Plain, for Concrete Reinforcement
ASTM A 153	(2001a) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 615	(2001b) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 641	(1998) Zinc-Coated (Galvanized) Carbon Steel Wire
ASTM C 67	(2002c) Sampling and Testing Brick and Structural Clay Tile
ASTM C 90	(2002) Loadbearing Concrete Masonry Units
ASTM C 91	(2001) Masonry Cement
ASTM C 94	(2000e2) Ready-Mixed Concrete
ASTM C 144	(2002) Aggregate for Masonry Mortar
ASTM C 150	(2002a) Portland Cement
ASTM C 270	(2002) Mortar for Unit Masonry
ASTM C 476	(2002) Grout for Masonry
ASTM C 641	(1998e1) Staining Materials in Lightweight Concrete Aggregates
ASTM C 744	(1999) Prefaced Concrete and Calcium Silicate Masonry Units

ASTM C 780	(2002) Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
ASTM C 1019	(2002) Sampling and Testing Grout
ASTM C 1072	(2000a) Measurement of Masonry Flexural Bond Strength
ASTM E 514	(2002) Water Penetration and Leakage Through Masonry

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Structural Masonry; G-AE.

Drawings including plans, elevations, and details of wall reinforcement; details of reinforcing bars at corners and wall intersections; offsets; tops, bottoms, and ends of walls; control and expansion joints; lintels; and wall openings. Bar splice locations shall be shown. Bent bars shall be identified on a bending diagram and shall be referenced and located on the drawings. Wall dimensions, bar clearances, and wall openings greater than one masonry unit in area shall be shown. No approval will be given to the shop drawings until the Contractor certifies that all openings, including those for mechanical and electrical service, are shown. If, during construction, additional masonry openings are required, the approved shop drawings shall be resubmitted with the additional openings shown along with the proposed changes. Location of these additional openings shall be clearly highlighted. The minimum scale for wall elevations shall be 1/4 inch per foot. Reinforcement bending details shall conform to the requirements of ACI SP-66.

SD-03 Product Data

Concrete Masonry Units; G-AO.

Manufacturer's descriptive data.

Cold Weather Installation; G-AO.

Cold weather construction procedures.

SD-04 Samples

Concrete Masonry Units (CMU); G-AE.
Stone Items; G-AE.

Color samples of three stretcher units and one unit for each type of special shape. Units shall show the full range of color and texture. Submit sample of colored mortar with applicable masonry unit.

Anchors, Ties, and Bar Positioners; FIO.

Two of each type used.

Joint Reinforcement; G-AO.

One piece of each type used, including corner and wall intersection pieces, showing at least two cross wires.

SD-05 Design Data

Pre-mixed Mortar; G-AO
Unit Strength Method; G-AO

Pre-mixed mortar composition. Calculations and certifications of masonry unit and mortar strength.

SD-06 Test Reports

Efflorescence Test;
Field Testing of Mortar; G-AO.
Field Testing of Grout; G-AO.
Prism tests; G-AO.

Test reports from an approved independent laboratory. Test reports on a previously tested material shall be certified as the same as that proposed for use in this project.

SD-07 Certificates

Concrete Masonry Units (CMU)

Anchors, Ties, and Bar Positioners
Joint Reinforcement
Reinforcing Steel Bars and Rods
Mortar Coloring
Precast Concrete Items
Admixtures for Masonry Mortar
Admixtures for Grout

Certificates of compliance stating that the materials meet the specified requirements.

Regulatory Requirements.

Report Stating that the products contain recycled materials and indicating the actual percentages of post-consumer and/or post-industrial recycled materials by weight.

Local Materials.

Report stating which products and their quantities by cost which were manufactured within 500 miles of project.

SD-08 Manufacturer's Instructions

Masonry Cement

When masonry cement is used, submit the manufacturer's printed instructions on proportions of water and aggregates and on mixing to obtain the type of mortar required.

1.3 DELIVERY, HANDLING, AND STORAGE

Materials shall be delivered, handled, stored, and protected to avoid chipping, breakage, and contact with soil or contaminating material.

1.3.1 Masonry Units

Concrete masonry units shall be covered or protected from inclement weather. Store Type II, concrete masonry units at the site for a minimum of 28 days for air cured units, 10 days for atmospheric steam or water cured units, and 3 days for units cured with steam at a pressure of 120 to 150 psi and at a temperature of 350 to 365 degrees F for at least 5 hours. Protect moisture controlled units (Type I) from rain and ground water.

1.3.2 Reinforcement, Anchors, and Ties

Steel reinforcing bars, coated anchors, ties, and joint reinforcement shall be stored above the ground. Steel reinforcing bars and uncoated ties shall be free of loose mill scale and rust.

1.3.3 Cementitious Materials, Sand and Aggregates

Cementitious and other packaged materials shall be delivered in unopened containers, plainly marked and labeled with manufacturers' names and brands. Cementitious material shall be stored in dry, weathertight enclosures or be completely covered. Cement shall be handled in a manner that will prevent the inclusion of foreign materials and damage by water or dampness. Sand and aggregates shall be stored in a manner to prevent contamination or segregation.

1.4 QUALITY ASSURANCE

1.4.1 Appearance

Blend all CMU to produce a uniform appearance when installed. An observable "banding" or "layering" of colors or textures caused by improperly mixed CMU is unacceptable.

1.4.2 Testing

Masonry strength shall be determined in accordance with ACI 530/530.1; submit test reports on three prisms as specified in ACI 530/530.1. The cost of testing shall be paid by the Contractor.

1.4.3 Spare Vibrator

Maintain at least one spare vibrator on site at all times.

1.4.4 Bracing and Scaffolding

Provide bracing and scaffolding necessary for masonry work. Design bracing to resist wind pressure as required by local code.

1.5 General Requirements

Contractor shall, as much as possible, select material manufacturers that reduce pollutant and waste, recycle waste, reuse resources and scrap, and reclaim materials instead of disposing into a landfill. Contractor shall, as much as possible, select material manufacturers that are located within 500 miles of the project.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

The source of materials which will affect the appearance of the finished work shall not be changed after the work has started except with Contracting Officer's approval.

2.2 CONCRETE MASONRY UNITS (CMU)

Cement shall have a low alkali content and be of one brand. Units shall be of modular dimensions and air, water, or steam cured.

a. Hollow Load-Bearing Units: ASTM C 90, Type I or II, made with or normal weight aggregate. Provide load-bearing units for exterior walls.

2.2.1 Aggregates

Lightweight aggregates and blends of lightweight and heavier aggregates in proportions used in producing the units, shall comply with the following requirements when tested for stain-producing iron compounds in accordance with ASTM C 641: by visual classification method, the iron stain deposited on the filter paper shall not exceed the "light stain" classification.

2.2.2 Kinds and Shapes

Units shall be modular in size and shall include closer, jamb, header, and special shapes and sizes to complete the work as indicated.

2.2.2.1 Architectural Units

Units shall have patterned face shell. Face shell pattern shall be split-face. Units shall be integrally colored during manufacture. Color shall be as shown on the drawings. Patterned face shell shall be properly aligned in the completed wall.

2.3 PRECAST CONCRETE ITEMS

Copings shall be factory-made units from a plant regularly engaged in producing precast concrete units. Unless otherwise indicated, concrete shall be 5000 psi minimum conforming to Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE using 1/2 inch to No. 4 nominal-size coarse aggregate, and minimum reinforcement shall be the reinforcement required for handling of the units. Clearance of 3/4 inch shall be maintained between reinforcement and faces of units. Unless precast-concrete items have been

subjected during manufacture to saturated-steam pressure of at least 120 psi for at least 5 hours, the items, after casting, shall be either damp-cured for 24 hours or steam-cured and shall then be aged under cover for 28 days or longer. Cast-concrete members weighing over 80 pounds shall have built-in loops of galvanized wire or other approved provisions for lifting and anchoring. Units shall have beds and joints at right angles to the face, with sharp true arises and shall be cast with drip grooves on the underside where units overhang walls. Exposed-to-view surfaces shall be free of surface voids, spalls, cracks, and chipped or broken edges. Precast units exposed-to-view shall be of uniform appearance and color. Unless otherwise specified, units shall have a smooth dense finish. Prior to use, each item shall be wetted and inspected for crazing. Items showing evidence of dusting, spalling, crazing, or having surfaces treated with a protective coating will be rejected.

2.4 STONE ITEMS

Stone for sills and copings shall be sandstone and shall be cut to the design shown. Sandstone shall be standard grade, buff brown, with a smooth finish free from clay pits and tool marks. Stone shall have beds and joints at right angles to the face, with sharp, true arises. Copings and sills shall be provided with washes, and where overhanging the walls, shall have drips cut on the underside.

2.5 MASONRY MORTAR

Mortar Type S shall conform to the proportion specification of ASTM C 270 except Type S cement-lime mortar proportions shall be 1 part cement, 1/2 part lime and 4-1/2 parts aggregate. When masonry cement ASTM C 91 is used the maximum air content shall be limited to 12 percent and performance equal to cement-lime mortar shall be verified. Verification of masonry cement performance shall be based on ASTM C 780 and ASTM C 1072.

2.5.1 Admixtures for Masonry Mortar

Cold weather accelerating admixtures may not be used.

2.5.2 Colored Mortar

Mortar coloring shall be added to the mortar used for exposed masonry surfaces to produce a uniform color. Quantity of pigment to cementitious content of the masonry cement shall not exceed 5 by weight; carbon black shall not exceed 1 percent by weight. Quantity of pigment to cementitious content of cement-lime mix shall not exceed 10 percent by weight, carbon black no more than 2 percent by weight. Mortar coloring shall be chemically inert, of finely ground limeproof pigment, and furnished in accurately pre-measured and packaged units that can be added to a measured amount of cement.

2.5.3 Cement

Portland cement shall conform to ASTM C 150, Type I, II, or III. Masonry cement shall conform to ASTM C 91, Type S. Containers shall bear complete instructions for proportioning and mixing to obtain the required types of mortar.

2.5.4 Pre-Mixed Mortar

Pre-mixed colored mortar is acceptable.

2.5.5 Sand and Water

Sand shall conform to ASTM C 144. Water shall be clean, potable, and free from substances which could adversely affect the mortar.

2.6 WATER-REPELLANT ADMIXTURE

Polymeric type formulated to reduce porosity and water transmission. Construct panels of masonry units conforming to ASTM C 744 and mortar which contain the water-repellant admixture. When tested in accordance with ASTM C 1072, such panels shall have flexural strength not less than that specified or indicated. When tested in accordance with ASTM E 514, panels shall exhibit no water visible on back of test panel and no leaks through the panel after 24 hours, and not more than 25 percent of wall area shall be damp after 72 hours.

2.7 GROUT AND READY-MIXED GROUT

Grout shall conform to ASTM C 476, coarse. Cement used in grout shall have a low alkali content. Grout slump shall be between 8 and 10 inches. Minimum grout strength shall be 2000 psi in 28 days, as tested by ASTM C 1019. Grout shall be used subject to the limitations of Table III. Proportions shall not be changed and materials with different physical or chemical characteristics shall not be used in grout for the work unless additional evidence is furnished that the grout meets the specified requirements. Ready-Mixed grout shall conform to ASTM C 94.

2.7.1 Admixtures for Grout

Cold weather accelerating admixtures may not be used.

2.7.2 Grout Barriers

Grout barriers for vertical cores shall consist of fine mesh wire, fiberglass, or expanded metal.

2.8 ANCHORS, TIES, AND BAR POSITIONERS

Anchors and ties shall be fabricated without drips or crimps and shall be zinc-coated in accordance with ASTM A 153, Class B-2. Steel wire used for anchors and ties shall be fabricated from steel wire conforming to ASTM A 82. Wire ties or anchors in exterior walls shall conform to ASTM A 641. Joint reinforcement in interior walls, and in exterior or interior walls exposed to moist environment shall conform to ASTM A 641; coordinate with paragraph JOINT REINFORCEMENT below. Anchors and ties shall be sized to provide a minimum of 5/8 inch mortar cover from either face.

2.8.1 Bar Positioners

Bar positioners, used to prevent displacement of reinforcing bars during the course of construction, shall be factory fabricated from 9 gauge steel wire or equivalent, and coated with a hot-dip galvanized finish. Not more than one wire shall cross the cell.

2.9 JOINT REINFORCEMENT

Joint reinforcement shall be factory fabricated from steel wire conforming to ASTM A 82, welded construction. Tack welding will not be acceptable in

reinforcement used for wall ties. Wire shall have zinc coating conforming to ASTM A 153, Class B-2. All wires shall be a minimum of 9 gauge. Reinforcement shall be ladder type design, having one longitudinal wire in the mortar bed of each face shell for hollow units and one wire for solid units. Joint reinforcement shall be placed a minimum of 5/8 inch cover from either face. The distance between crosswires shall not exceed 16 inches. Joint reinforcement for straight runs shall be furnished in flat sections not less than 10 feet long. Joint reinforcement shall be provided with factory formed corners and intersections. If approved for use, joint reinforcement may be furnished with adjustable wall tie features.

2.10 REINFORCING STEEL BARS AND RODS

Reinforcing steel bars and rods shall conform to ASTM A 615, Grade 60.

PART 3 EXECUTION

3.1 PREPARATION

Prior to start of work, masonry inspector shall verify the applicable conditions as set forth in ACI 530/530.1, inspection. The Contracting Officer will serve as inspector or will select a masonry inspector.

3.1.1 Hot Weather Installation

The following precautions shall be taken if masonry is erected when the ambient air temperature is more than 99 degrees F in the shade and the relative humidity is less than 50 percent or the ambient air temperature exceeds 90 degrees F and the wind velocity is more than 8 mph. All masonry materials shall be shaded from direct sunlight; mortar beds shall be spread no more than 4 feet ahead of masonry; masonry units shall be set within one minute of spreading mortar; and after erection, masonry shall be protected from direct exposure to wind and sun for 48 hours.

3.1.2 Cold Weather Installation

Before erecting masonry when ambient temperature or mean daily air temperature falls below 40 degrees F or temperature of masonry units is below 40 degrees F, a written statement of proposed cold weather construction procedures shall be submitted for approval. The following precautions shall be taken during all cold weather erection.

3.1.2.1 Protection

Ice or snow formed on the masonry bed shall be thawed by the application of heat. Heat shall be applied carefully until the top surface of the masonry is dry to the touch. Sections of masonry deemed frozen and damaged shall be removed before continuing construction of those sections.

a. Air Temperature 40 to 32 Degrees F. Sand or mixing water shall be heated to produce mortar temperatures between 40 and 120 degrees F.

b. Air Temperature 32 to 25 Degrees F. Sand and mixing water shall be heated to produce mortar temperatures between 40 and 120 degrees F. Temperature of mortar on boards shall be maintained above freezing.

c. Air Temperature 25 to 20 Degrees F. Sand and mixing water shall be heated to provide mortar temperatures between 40 and 120

degrees F. Temperature of mortar on boards shall be maintained above freezing. Sources of heat shall be used on both sides of walls under construction. Windbreaks shall be employed when wind is in excess of 15 mph.

d. Air Temperature 20 Degrees F and below. Sand and mixing water shall be heated to provide mortar temperatures between 40 and 120 degrees F. Enclosure and auxiliary heat shall be provided to maintain air temperature above 32 degrees F. Temperature of units when laid shall not be less than 20 degrees F.

3.1.2.2 Completed Masonry and Masonry Not Being Worked On

a. Mean daily air temperature 40 to 32 degrees F. Masonry shall be protected from rain or snow for 24 hours by covering with weather-resistive membrane.

b. Mean daily air temperature 32 to 25 degrees F. Masonry shall be completely covered with weather-resistant membrane for 24 hours.

c. Mean Daily Air Temperature 25 to 20 degrees F. Masonry shall be completely covered with insulating blankets or equally protected for 24 hours.

d. Mean Daily Temperature 20 degrees F and Below. Masonry temperature shall be maintained above 32 degrees F for 24 hours by enclosure and supplementary heat, by electric heating blankets, infrared heat lamps, or other approved methods.

3.1.3 Stains

Potect exposed surfaces from mortar and other stains. When mortar joints are tooled, remove mortar from exposed surfaces with fiber brushes and wooden paddles. Protect base of walls from splash stains by covering adjacent ground with sand, sawdust, or polyethylene.

3.1.4 Loads

Do not apply uniform loads for at least 12 hours or concentrated loads for at least 72 hours after masonry is constructed. Provide temporary bracing as required.

3.1.5 Surfaces

Surfaces on which masonry is to be placed shall be cleaned of laitance, dust, dirt, oil, organic matter, or other foreign materials and shall be slightly roughened to provide a surface texture with a depth of at least 1/8 inch. Sandblasting shall be used, if necessary, to remove laitance from pores and to expose the aggregate.

3.2 LAYING MASONRY UNITS

Coordinate masonry work with the work of other trades to accommodate built-in items and to avoid cutting and patching. Masonry units shall be laid in running bond pattern. Facing courses shall be level with back-up courses, unless the use of adjustable ties has been approved in which case the tolerances shall be plus or minus 1/2 inch. Each unit shall be adjusted to its final position while mortar is still soft and plastic. Units that have been disturbed after the mortar has stiffened shall be

removed, cleaned, and relaid with fresh mortar. Air spaces, cavities, and spaces to be grouted shall be kept free from mortar and other debris. Units used in exposed masonry surfaces shall be selected from those having the least amount of chipped edges or other imperfections detracting from the appearance of the finished work. Vertical joints shall be kept plumb. Units being laid and surfaces to receive units shall be free of water film and frost. Solid units shall be laid in a nonfurrowed full bed of mortar. Mortar for veneer wythes shall be beveled and sloped toward the center of the wythe from the cavity side. Units shall be shoved into place so that the vertical joints are tight. Vertical joints of brick and the vertical face shells of concrete masonry units, except where indicated at control, expansion, and isolation joints, shall be completely filled with mortar. Mortar will be permitted to protrude up to 1/2 inch into the space or cells to be grouted. Means shall be provided to prevent mortar from dropping into the space below.

3.2.1 Forms and Shores

Provide bracing and scaffolding as required. Design bracing to resist wind pressure as required by local codes. Forms and shores shall be sufficiently rigid to prevent deflections which may result in cracking or other damage to supported masonry and sufficiently tight to prevent leakage of mortar and grout. Supporting forms and shores shall not be removed in less than 10 days.

3.2.2 Reinforced Concrete Masonry Units Walls

Where vertical reinforcement occurs, fill cores solid with grout. Lay units in such a manner as to preserve the unobstructed vertical continuity of cores to be filled. Embed the adjacent webs in mortar to prevent leakage of grout. Remove mortar fins protruding from joints before placing grout. Minimum clear dimensions of vertical cores shall be 2 by 3 inches. Position reinforcing accurately as indicated before placing grout. As masonry work progresses, secure vertical reinforcing in place at vertical intervals not to exceed 160 bar diameters. Use puddling rod or vibrator to consolidate the grout. Minimum clear distance between masonry and vertical reinforcement shall be not less than 1/2 inch. Unless indicated or specified otherwise, form splices by lapping bars not less than 40 bar diameters and wire tying them together.

3.2.3 Concrete Masonry Units

Units in piers, pilasters, columns, starting courses on footings, and where cells are to be filled with grout shall be full bedded in mortar under both face shells and webs. Other units shall be full bedded under both face shells. Head joints shall be filled solidly with mortar for a distance in from the face of the unit not less than the thickness of the face shell. Foundation walls below grade shall be grouted solid. Jamb units shall be of the shapes and sizes to conform with wall units.

3.2.4 Clay or Shale Brick Units

3.2.4.1 Hollow Units

Hollow units shall be laid as specified for concrete masonry units.

3.2.5 Tolerances

Masonry shall be laid plumb, true to line, with courses level. Bond

pattern shall be kept plumb throughout. Corners shall be square unless noted otherwise. Masonry shall be laid within the following tolerances (plus or minus unless otherwise noted):

TABLE II

TOLERANCES

Variation from the plumb in the lines and surfaces of columns, walls and arises	
In adjacent masonry units	1/8 inch
In 10 feet	1/4 inch
In 20 feet	3/8 inch
In 40 feet or more	1/2 inch
Variations from the plumb for external corners, expansion joints, and other conspicuous lines	
In 20 feet	1/4 inch
In 40 feet or more	1/2 inch
Variations from the level for exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines	
In 20 feet	1/4 inch
In 40 feet or more	1/2 inch
Variation from level for bed joints and top surfaces of bearing walls	
In 10 feet	1/4 inch
In 40 feet or more	1/2 inch
Variations from horizontal lines	
In 10 feet	1/4 inch
In 20 feet	3/8 inch
In 40 feet or more	1/2 inch
Variations in cross sectional dimensions of columns and in thickness of walls	
Minus	1/4 inch
Plus	1/2 inch

3.2.6 Cutting and Fitting

Full units of the proper size shall be used wherever possible, in lieu of cut units. Cutting and fitting, including that required to accommodate the work of others, shall be done by masonry mechanics using power masonry saws. Concrete masonry units may be wet or dry cut. Wet cut units, before

being placed in the work, shall be dried to the same surface-dry appearance as uncut units being laid in the wall. Cut edges shall be clean, true and sharp.

3.2.7 Jointing

Joints shall be tooled when the mortar is thumbprint hard. Horizontal joints shall be tooled last. Joints shall be brushed to remove all loose and excess mortar. Mortar joints shall be finished as follows:

3.2.7.1 Tooled Joints

Joints in exposed exterior and interior masonry surfaces shall be tooled slightly concave. Joints shall be tooled with a jointer slightly larger than the joint width so that complete contact is made along the edges of the unit. Tooling shall be performed so that the mortar is compressed and the joint surface is sealed. Jointer of sufficient length shall be used to obtain a straight and true mortar joint.

3.2.8 Joint Widths

Joint widths shall be as follows:

3.2.8.1 Concrete Masonry Units

Concrete masonry units shall have 3/8 inch joints, except for prefaced concrete masonry units.

3.2.9 Embedded Items

Spaces around built-in items shall be filled with mortar. Anchors, ties, wall plugs, accessories, and other items required to be built-in shall be embedded as the masonry work progresses. Anchors, ties and joint reinforcement shall be fully embedded in the mortar.

3.2.10 Unfinished Work

Unfinished work shall be stepped back for joining with new work. Toothing may be resorted to only when specifically approved. Loose mortar shall be removed and the exposed joints shall be thoroughly cleaned before laying new work.

3.2.11 Masonry Wall Intersections

Each course shall be masonry bonded at corners and elsewhere as shown. Masonry walls shall be anchored or tied together at corners and intersections with bond beam reinforcement and prefabricated corner or tee pieces of joint reinforcement as shown.

3.3 WEEP HOLES

Wherever through-wall flashing occurs, provide weep holes to drain flashing to exterior. Weep holes shall be clear round holes not less than 1/4 inch in diameter at 24 inches o.c. Weep holes shall be provided not more than 24 inches on centers in mortar joints of the exterior wythe above wall flashing, over foundations, bond beams, and any other horizontal interruptions of the cavity. Weep holes shall be formed by placing short lengths of well-greased No. 10, 5/16 inch nominal diameter, braided cotton sash cord in the mortar and withdrawing the cords after the wall has been

completed. Other approved methods may be used for providing weep holes. Weep holes shall be kept free of mortar and other obstructions.

3.4 MORTAR

Mortar shall be mixed in a mechanically operated mortar mixer for at least 3 minutes, but not more than 5 minutes. Measurement of ingredients for mortar shall be by volume. Ingredients not in containers, such as sand, shall be accurately measured by the use of measuring boxes. Water shall be mixed with the dry ingredients in sufficient amount to provide a workable mixture which will adhere to the vertical surfaces of masonry units. Mortar that has stiffened because of loss of water through evaporation shall be retempered by adding water to restore the proper consistency and workability. Mortar that has reached its initial set or that has not been used within 2-1/2 hours after mixing shall be discarded.

3.5 REINFORCING STEEL

Reinforcement shall be cleaned of loose, flaky rust, scale, grease, mortar, grout, or other coating which might destroy or reduce its bond prior to placing grout. Bars with kinks or bends not shown on the drawings shall not be used. Reinforcement shall be placed prior to grouting. Unless otherwise indicated, vertical wall reinforcement shall extend to within 2 inches of tops of walls.

3.5.1 Positioning Bars

Vertical bars shall be accurately placed within the cells at the positions indicated on the drawings. A minimum clearance of 1/2 inch shall be maintained between the bars and masonry units. Minimum clearance between parallel bars shall be one diameter of the reinforcement. Vertical reinforcing may be held in place using bar positioners located near the ends of each bar and at intermediate intervals of not more than 192 diameters of the reinforcement. Column and pilaster ties shall be wired in position around the vertical steel. Ties shall be in contact with the vertical reinforcement and shall not be placed in horizontal bed joints.

3.5.2 Splices

Bars shall be lapped a minimum of 48 diameters of the reinforcement. Welded or mechanical connections shall develop at least 125 percent of the specified yield strength of the reinforcement.

3.6 JOINT REINFORCEMENT INSTALLATION

Joint reinforcement shall be installed at 16 inches on center or as indicated. Reinforcement shall be lapped not less than 6 inches. Prefabricated sections shall be installed at corners and wall intersections. The longitudinal wires of joint reinforcement shall be placed to provide not less than 5/8 inch cover to either face of the unit.

3.7 PLACING GROUT

Cells containing reinforcing bars shall be filled with grout. Hollow masonry units in walls or partitions supporting plumbing, heating, or other mechanical fixtures, voids at door and window jambs, and other indicated spaces shall be filled solid with grout. Cells under lintel bearings on each side of openings shall be filled solid with grout for full height of openings. Walls below grade, lintels, and bond beams shall be filled solid

with grout. Units other than open end units may require grouting each course to preclude voids in the units. Grout not in place within 1-1/2 hours after water is first added to the batch shall be discarded. Sufficient time shall be allowed between grout lifts to preclude displacement or cracking of face shells of masonry units. If blowouts, flowouts, misalignment, or cracking of face shells should occur during construction, the wall shall be torn down and rebuilt.

3.7.1 Vertical Grout Barriers for Fully Grouted Walls

Grout barriers shall be provided not more than 30 feet apart, or as required, to limit the horizontal flow of grout for each pour.

3.7.2 Horizontal Grout Barriers

Grout barriers shall be embedded in mortar below cells of hollow units receiving grout.

3.7.3 Grout Holes and Cleanouts

3.7.3.1 Grout Holes

Grouting holes shall be provided in slabs, spandrel beams, and other in-place overhead construction. Holes shall be located over vertical reinforcing bars or as required to facilitate grout fill in bond beams. Additional openings spaced not more than 16 inches on centers shall be provided where grouting of all hollow unit masonry is indicated. Openings shall not be less than 4 inches in diameter or 3 by 4 inches in horizontal dimensions. Upon completion of grouting operations, grouting holes shall be plugged and finished to match surrounding surfaces.

3.7.3.2 Cleanouts for Hollow Unit Masonry Construction

Cleanout holes shall be provided at the bottom of every pour in cores containing vertical reinforcement when the height of the grout pour exceeds 5 feet. Where all cells are to be grouted, cleanout courses shall be constructed using bond beam units in an inverted position to permit cleaning of all cells. Cleanout holes shall be provided at a maximum spacing of 32 inches where all cells are to be filled with grout. A new series of cleanouts shall be established if grouting operations are stopped for more than 4 hours. Cleanouts shall not be less than 3 by 4 inch openings cut from one face shell. Manufacturer's standard cutout units may be used at the Contractor's option. Cleanout holes shall not be closed until masonry work, reinforcement, and final cleaning of the grout spaces have been completed and inspected. For walls which will be exposed to view, cleanout holes shall be closed in an approved manner to match surrounding masonry.

3.7.4 Grouting Equipment

3.7.4.1 Grout Pumps

Pumping through aluminum tubes will not be permitted. Pumps shall be operated to produce a continuous stream of grout without air pockets, segregation, or contamination. Upon completion of each day's pumping, waste materials and debris shall be removed from the equipment, and disposed of outside the masonry.

3.7.4.2 Vibrators

Internal vibrators shall maintain a speed of not less than 5,000 impulses per minute when submerged in the grout. At least one spare vibrator shall be maintained at the site at all times. Vibrators shall be applied at uniformly spaced points not further apart than the visible effectiveness of the machine. Duration of vibration shall be limited to time necessary to produce satisfactory consolidation without causing segregation.

3.7.5 Grout Placement

Masonry shall be laid to the top of a pour before placing grout. Grout shall not be placed in two-wythe solid unit masonry cavity until mortar joints have set for at least 3 days during hot weather and 5 days during cold damp weather. Grout shall not be placed in hollow unit masonry until mortar joints have set for at least 24 hours. Grout shall be placed using a hand bucket, concrete hopper, or grout pump to completely fill the grout spaces without segregation of the aggregates. Vibrators shall not be inserted into lower pours that are in a semi-solidified state. The height of grout pours and type of grout used shall be limited by the dimensions of grout spaces as indicated in Table III. Low-lift grout methods may be used on pours up to and including 5 feet in height. High-lift grout methods shall be used on pours exceeding 5 feet in height.

3.7.5.1 Low-Lift Method

Grout shall be placed at a rate that will not cause displacement of the masonry due to hydrostatic pressure of the grout. Mortar protruding more than 1/2 inch into the grout space shall be removed before beginning the grouting operation. Grout pours 12 inches or less in height shall be consolidated by mechanical vibration or by puddling. Grout pours over 12 inches in height shall be consolidated by mechanical vibration and reconsolidated by mechanical vibration after initial water loss and settlement has occurred. Vibrators shall not be inserted into lower pours that are in a semi-solidified state. Low-lift grout shall be used subject to the limitations of Table III.

3.7.5.2 High-Lift Method

Mortar droppings shall be cleaned from the bottom of the grout space and from reinforcing steel. Mortar protruding more than 1/4 inch into the grout space shall be removed by dislodging the projections with a rod or stick as the work progresses. Reinforcing, bolts, and embedded connections shall be rigidly held in position before grouting is started. CMU units shall not be pre-wetted. Grout, from the mixer to the point of deposit in the grout space shall be placed as rapidly as practical by pumping and placing methods which will prevent segregation of the mix and cause a minimum of grout splatter on reinforcing and masonry surfaces not being immediately encased in the grout lift. The individual lifts of grout shall be limited to 4 feet in height. The first lift of grout shall be placed to a uniform height within the pour section and vibrated thoroughly to fill all voids. This first vibration shall follow immediately behind the pouring of the grout using an approved mechanical vibrator. After a waiting period sufficient to permit the grout to become plastic, but before it has taken any set, the succeeding lift shall be poured and vibrated 12 to 18 inches into the preceding lift. If the placing of the succeeding lift is going to be delayed beyond the period of workability of the preceding, each lift shall be reconsolidated by reworking with a second vibrator as soon as the grout has taken its settlement shrinkage. The

waiting, pouring, and reconsolidation steps shall be repeated until the top of the pour is reached. The top lift shall be reconsolidated after the required waiting period. The high-lift grouting of any section of wall between vertical grout barriers shall be completed to the top of a pour in one working day unless a new series of cleanout holes is established and the resulting horizontal construction joint cleaned. High-lift grout shall be used subject to the limitations in Table III.

TABLE III

POUR HEIGHT AND TYPE OF GROUT FOR VARIOUS GROUT SPACE DIMENSIONS

Maximum Grout Pour Height (feet) (4)	Grout Type	Grouting Procedure	Minimum Dimensions of the Total Clear Areas Within Grout Spaces and Cells (in.) (1,2) Multiwythe Masonry (3)	Hollow-unit Masonry
1	Fine	Low Lift	3/4	1-1/2 x 2
5	Fine	Low Lift	2	2 x 3
8	Fine	High Lift	2	2 x 3
12	Fine	High Lift	2-1/2	2-1/2 x 3
24	Fine	High Lift	3	3 x 3
1	Coarse	Low Lift	1-1/2	1-1/2 x 3
5	Coarse	Low Lift	2	2-1/2 x 3
8	Coarse	High Lift	2	3 x 3
12	Coarse	High Lift	2-1/2	3 x 3
24	Coarse	High Lift	3	3 x 4

Notes:

(1) The actual grout space or cell dimension must be larger than the sum of the following items:
a) The required minimum dimensions of total clear areas given in the table above;
b) The width of any mortar projections within the space;
c) The horizontal projections of the diameters of the horizontal reinforcing bars within a cross section of the grout space or cell.

(2) The minimum dimensions of the total clear areas shall be made up of one or more open areas, with at least one area being 3/4 inch or greater in width.

(3) For grouting spaces between masonry wythes.

(4) Where only cells of hollow masonry units containing reinforcement are grouted, the maximum height of the pour shall not exceed the distance between horizontal bond beams.

3.8 COPINGS

Copings shall be set in a full bed of mortar with faces plumb and true.

3.9 POINTING AND CLEANING

After mortar joints have attained their initial set, but prior to hardening, mortar and grout daubs or splashings shall be completely removed from masonry-unit surfaces that will be exposed or painted. Before

completion of the work, defects in joints of masonry to be exposed or painted shall be raked out as necessary, filled with mortar, and tooled to match existing joints. Immediately after grout work is completed, scum and stains which have percolated through the masonry work shall be removed using a high pressure stream of water and a stiff bristled brush. Masonry surfaces shall not be cleaned, other than removing excess surface mortar, until mortar in joints has hardened. Masonry surfaces shall be left clean, free of mortar daubs, dirt, stain, and discoloration, including scum from cleaning operations, and with tight mortar joints throughout. Metal tools and metal brushes shall not be used for cleaning.

3.9.1 Concrete Masonry Unit Surfaces

Exposed concrete masonry unit surfaces shall be dry-brushed at the end of each day's work and after any required pointing, using stiff-fiber bristled brushes.

3.10 PROTECTION

Facing materials shall be protected against staining. Top of walls shall be covered with nonstaining waterproof covering or membrane when work is not in progress. Covering of the top of the unfinished walls shall continue until the wall is waterproofed with a complete roof or parapet system. Covering shall extend a minimum of 2 feet down on each side of the wall and shall be held securely in place. Before starting or resuming, top surface of masonry in place shall be cleaned of loose mortar and foreign material.

3.11 TEST REPORTS

3.11.1 Field Testing of Mortar

At least three specimens of mortar shall be taken each day. A layer of mortar 1/2 to 5/8 inch thick shall be spread on the masonry units and allowed to stand for one minute. The specimens shall then be prepared and tested for compressive strength in accordance with ASTM C 780.

3.11.2 Field Testing of Grout

Field sampling and testing of grout shall be in accordance with the applicable provisions of ASTM C 1019. A minimum of three specimens of grout per day shall be sampled and tested. Each specimen shall have a minimum ultimate compressive strength of 2000 psi at 28 days.

3.11.3 Efflorescence Test

CMU shall be tested for efflorescence. Tests shall be scheduled far enough in advance of starting masonry work to permit retesting if necessary. Sampling and testing shall conform to the applicable provisions of ASTM C 67. Units meeting the definition of "effloresced" will be subject to rejection.

3.11.4 Prism Tests

At least one prism test sample shall be made for each 5,000 square feet of wall. Prisms shall be tested in accordance with ACI 530/530.1. Seven-day tests may be used provided the relationship between the 7- and 28-day strengths of the masonry is established by the tests of the materials used. Compressive strength shall not be less than 1900 psi at 28 days. If the compressive strength of any prism falls below the specified value by more

than 500 psi, steps shall be taken to assure that the load-carrying capacity of the structure is not jeopardized. If the likelihood of low-strength masonry is confirmed and computations indicate that the load-carrying capacity may have been significantly reduced, tests of cores drilled, or prisms sawed, from the area in question may be required. In such case, three specimens shall be taken for each prism test more than 500 psi below the specified value. Masonry in the area in question shall be considered structurally adequate if the average compressive strength of three specimens is equal to at least 85 percent of the specified value, and if the compressive strength of no single specimen is less than 75 percent of the specified value. Additional testing of specimens extracted from locations represented by erratic core or prism strength test results shall be permitted.

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SECTION 04810

NONBEARING MASONRY VENEER/STEEL STUD WALLS
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC 316	(1989) ASD Manual of Steel Construction

AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI SG-971-Spec	(1996) Specification and Commentary for the Design of Cold-Formed Steel Structural Members and Commentary; includes SG-2000-1 Supp 1 to 1996 Spec, dated 2000

ASTM INTERNATIONAL (ASTM)

ASTM A 123	(2001a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 153	(2001a) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 36	(2001) Carbon Structural Steel
ASTM A 653	(2001a) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 82	(2001) Steel Wire, Plain, for Concrete Reinforcement
ASTM C 1002	(2001) Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
ASTM C 1072	(2000a) Measurement of Masonry Flexural Bond Strength
ASTM C 1177/C 1177M	(2001) Glass Mat Gypsum Substrate for Use as Sheathing
ASTM C 270	(2001a) Mortar for Unit Masonry

ASTM C 665	(2001e1) Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
ASTM C 67	(2002) Sampling and Testing Brick and Structural Clay Tile
ASTM C 744	(1999) Prefaced Concrete and Calcium Silicate Masonry Units
ASTM C 780	(2000) Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
ASTM C 79/C 79M	(2001) Treated Core and Nontreated Core Gypsum Sheathing Board
ASTM C 90	(2002) Loadbearing Concrete Masonry Units
ASTM C 91	(2001) Masonry Cement
ASTM C 954	(2000) Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
ASTM C 955	(2001) Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases
ASTM D 1330	(2000) Rubber Sheet Gaskets
ASTM D 2103	(1997) Polyethylene Film and Sheeting
ASTM D 226	(1997a) Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
ASTM E 514	(2002) Water Penetration and Leakage Through Masonry

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASHRAE Hdbk-IP	(2001) Fundamentals Handbook, I-P Edition

AMERICAN WELDING SOCIETY (AWS)

AWS D1.3	(1998) Structural Welding Code - Sheet Steel

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the

Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Detail Drawings; G, AE.

Detail drawings as specified.

SD-04 Samples

Expansion Joint Materials.

Concrete Masonry Units; G, AE.

Sample Panel; G, AE.

A portable panel, approximately 2 by 2 feet, containing approximately 24 concrete masonry unit facings to establish the range of color and texture. One of each type of masonry veneer anchor used.

SD-06 Test Reports

Calculations; G, AE.

Calculations demonstrating the structural adequacy of steel lintels and shelf angles for the calculated gravity loads being supported; this analysis shall be in accordance with AISC 316. Test results demonstrating that the veneer anchors are structurally adequate to resist the specified loadings shall be submitted for approval. Calculations demonstrating the insulation shown on the drawings provides the specified U-value for heat transmission of the completed exterior wall construction; this analysis shall be in accordance with ASHRAE Hdbk-IP. Manufacturer's descriptive data and installation instructions for the insulation, the vapor barrier and the moisture barrier.

SD-07 Certificates

Concrete Masonry Unit.
Joint Reinforcement.
Expansion Joint Materials.
Insulation.
Exterior Sheathing.
Moisture Barrier.
Vapor Retarder.
Veneer Anchors.
Welding.

Certificates stating that the materials and welders meet the requirements specified. Each certificate shall be signed by an authorized certification official and shall include their organization and position and shall identify the products covered under their certifying signature.

Regulatory Requirements.

Report stating that the products contain recycled materials and

indicating the actual percentages of post-industrial recycled materials by weight.

1.3 SAMPLE PANEL

After the material samples are approved and prior to starting masonry work, a sample masonry panel shall be built on the project site where directed. The sample panel shall be not less than 6 feet long by 4 feet high. The panel shall be of typical wall thickness for the construction represented. The panel shall show color range, texture, bond pattern, expansion joints, and cleaning of the masonry as required in the work. The panel shall also show cold-formed steel framing, insulation, gypsum wallboard, gypsum sheathing, moisture barrier, vapor barrier, veneer anchors, joint reinforcement, flashing and weep holes. The approved sample panel shall be used as a standard of workmanship required in the actual installation. The sample panel shall be protected from weather and construction operations and shall not be removed until the masonry veneer/steel stud wall work has been completed and accepted.

1.4 DELIVERY, HANDLING AND STORAGE

Materials shall be delivered and handled avoiding chipping, breakage, bending or other damage, and contact with soil or other contaminating materials. The masonry products shall be stored off the ground and protected from inclement weather. Cementitious materials shall be delivered in unopened containers plainly marked and labeled with manufacturer's names and brands. Cementitious materials shall be stored in dry, weather-tight enclosures or covers. Sand and other aggregates shall be stored preventing contamination or segregation and under a weather-tight covering permitting good air circulation. Finish of the framing members shall be maintained at all times, using an approved high zinc dust content galvanizing repair paint whenever necessary to prevent the formation of rust. Insulation, moisture barrier, and gypsum sheathing shall be stored in dry, well ventilated, weather-tight areas protected from sunlight and excessive heat. Air infiltration type vapor barrier shall be stored in accordance with the manufacturer's recommendations.

1.5 EFFLORESCENCE TESTS

Efflorescence tests shall be performed by an approved commercial testing laboratory. Sampling for the tests shall be the responsibility of the Contractor. Brick shall be sampled and tested for efflorescence in accordance with ASTM C 67 and the rating shall be: "not effloresced".

1.6 DETAIL DRAWINGS

The Contractor shall submit details of cold-formed steel framing and support around openings, including framing connections, steel lintels, steel shelf angles, attachment to other building elements and bridging. Drawings shall indicate thickness, material, dimensions, protective coatings, and section properties of all steel lintels used in exterior wall framing. Drawings shall also indicate size and type of all fasteners including size and type of all welds.

1.7 GENERAL REQUIREMENTS

Contractor shall, as much as possible, select material manufacturers that reduce pollutant and waste, recycle waste, reuse resources and scrap, and reclaim materials instead of disposing in a landfill.

PART 2 PRODUCTS

2.1 VENEER WYTHE

The source of masonry materials which will affect the appearance of the finished work shall not be changed after the work has started except with the Contracting Officer's approval.

2.1.1 Concrete Masonry Unit

Concrete masonry unit veneer shall be solid and conform to ASTM C 90. Architectural type, color range and texture shall be as indicated and shall conform to the approved sample. Masonry unit sizes shall be modular.

2.1.2 Water-Repellant Admixture

Polymeric type formulated to reduce porosity and water transmission. Construct panels of masonry units conforming to ASTM C 744 and mortar which contain the water-repellant admixture. When tested in accordance with ASTM C 1072, such panels shall have flexural strength not less than that specified or indicated. When tested in accordance with ASTM E 514, panels shall exhibit no water visible on back of test panel and no leaks through the panel after 24 hours, and not more than 25 percent of wall area shall be damp after 72 hours.

2.2 MORTAR

Mortar shall conform to ASTM C 270, Type S. Mortar mix shall be based on proportion specifications. Laboratory testing of mortar shall be in accordance with the preconstruction evaluation of mortar section of ASTM C 780. Cement shall have a low alkali content and be of one brand. Aggregates shall be from one source. Colored pre-mixed mortar is acceptable. Mortar shall contain water-repellant admixture.

2.2.1 Masonry Cement

Masonry cement in conformance with ASTM C 91 may be used in the mortar. When using a masonry cement a comparative test shall be performed between a Portland cement-lime mortar and the masonry cement mortar proposed for the project to evaluate the ASTM C 1072 bond and the ASTM C 780 compressive strength of the two mixes. The test shall be conducted with the proposed masonry units for the project. The masonry cement mortar will be acceptable if the bond and compressive strength values are equal to or higher than the portland cement-lime mix. The air-content of the masonry cement shall be limited to 12 percent maximum.

2.2.2 Admixtures

In cold weather, accelerating admixtures shall not be used.

2.3 JOINT REINFORCEMENT

Joint reinforcement shall be of steel wire conforming to ASTM A 82. Fabrication shall be by welding. Tack welding will not be permitted. Reinforcement shall be zinc-coated after fabrication in accordance with ASTM A 153, Class B-2. Joint reinforcement shall consist of at least 1 continuous longitudinal wire in the veneer wythe. Minimum wire cross section shall be 0.017 square inches.

2.4 COLD-FORMED STEEL FRAMING

Cold-formed framing shall consist of steel studs, top and bottom tracks, runners, horizontal bridging, and other cold-formed members and other accessories. All members and components made of sheet steel shall be hot-dip galvanized in accordance with ASTM A 653 with a minimum coating thickness of G 60. Framing covered herein shall be used only in framing the exterior masonry veneer steel stud wall system as indicated on the detail drawings. Metal framing for interior partitions are specified in Section 09100 METAL SUPPORT ASSEMBLIES.

2.4.1 Steel Studs

Studs shall be furnished as shown in the contract drawings.

2.4.2 Runners, Tracks, Bridging and Accessories

Cold-formed steel sheet framing members, components, and accessories, other than the steel studs, shall conform to ASTM C 955 and be of steel conforming to ASTM A 653, Grade 33, having a minimum yield strength of 33,000 psi.

2.5 INSULATION

The Contractor shall comply with EPA requirements in accordance with Section 01670 RECYCLED / RECOVERED MATERIALS.

2.5.1 Blanket Insulation

Insulation placed between the steel studs shall be batt or blanket type mineral wool conforming to ASTM C 665, Type II.

2.6 GYPSUM WALLBOARD

Gypsum wallboard that is installed on the interior side of the cold-formed steel framing system shall be as specified in Section 09250 GYPSUM BOARD.

2.7 EXTERIOR SHEATHING

Gypsum sheathing that is installed on the exterior side of the cold-formed steel framing system shall have a minimum thickness of 1/2 inch and shall be 4 feet wide. Glass mat gypsum sheathing shall conform to ASTM C 79/C 79M and ASTM C 1177/C 1177M. Glass mat gypsum sheathing shall have a water-resistant core with a water-resistant glass mat embedded onto core and shall have a zero flame, zero smoke developed, and shall have mold and mildew resistant surface.

2.8 MOISTURE PROTECTION

2.8.1 Moisture Barrier

The moisture barrier shall be 15-lb asphalt-saturated felt conforming to ASTM D 226 Type I (No. 15).

2.8.2 Vapor Retarder

The vapor retarder shall be polyethylene film conforming to ASTM D 2103, 6 mil minimum thickness.

2.8.3 Staples

Staples for attaching the moisture barrier to the exterior sheathing shall be the type and size best suited to provide a secure connection. Staples shall be made from either galvanized steel or stainless steel wire.

2.8.4 Joint Tape

Tape for sealing the joints in the vapor retarder shall be laminated tape with pressure sensitive adhesive as recommended by the manufacturer of the polyethylene film.

2.9 VENEER ANCHORS

Anchor assemblies for the attachment of the masonry veneer to the cold-formed steel framing, structural steel and/or concrete beam and column members, and concrete floor slabs shall be designed for the design loadings shown. Anchors shall transfer the design loadings from the masonry veneer to the cold-formed steel framing system or other support without exceeding the allowable stresses and deflections in the anchors. Length of anchor wires shall be such that the outermost wires lie between 1-1/4 inch from each face of the masonry veneer. Anchors wires shall not have drips. Wires for veneer anchors shall be rectangular or triangular hoops formed from 3/16 inch diameter steel wire conforming to ASTM A 82. Anchor assemblies including wires and anchor plates shall be hot-dip galvanized conforming to ASTM A 153, Class B-2. The veneer anchor shall have a minimum capacity of 200 pounds. The load-displacement capacity of each veneer anchor, both in direct pull-out for tension and compression, shall be not less than 2000 pounds per inch (or a deflection of 0.05 inches per 100 pounds of load in tension or compression). In the direction perpendicular to the masonry veneer, the anchor assembly shall have a maximum play of 1/16 inch.

2.9.1 Adjustable Pintle-Eye Type Wire Anchors

Adjustable pintle-eye type wall anchors shall be two pieces rectangular type double pintle anchors.

2.10 CONNECTIONS

Screws, bolts and anchors shall be hot-dip galvanized in accordance with ASTM A 123 or ASTM A 153 as appropriate.

2.10.1 Framing Screws, Bolts and Anchors

Screws, bolts and anchors used in the assembly of the cold-formed steel framing system shall be as shown. Screw, bolt and anchor sizes shall be shown on the detail drawings.

2.10.2 Welding

Welded connections shall be designed and all welding shall be performed in accordance with AWS D1.3, as modified by AISI SG-971-Spec. Welders shall be qualified in accordance with AWS D1.3. All welds shall be cleaned and touched-up with zinc-rich paint.

2.10.3 Veneer Anchor Screws

Screws for attachment of the veneer anchors to the cold-formed steel framing members shall be as shown. Screws shall be shown on the detail drawings. The length of screws shall be such that the screws penetrate the holding member by not less than 5/8 inch.

2.10.4 Gypsum Sheathing Screws

Screws for attachment of gypsum sheathing to cold-formed steel framing shall conform to ASTM C 1002, Type S or ASTM C 954.

2.11 SYNTHETIC RUBBER WASHERS

Synthetic rubber washers for placement between veneer anchors and the moisture barrier on the outside face of the exterior sheathing shall conform to ASTM D 1330, Grade I.

2.12 FLASHING

Copper or stainless steel flashing shall conform to the requirements in Section 07600 FLASHING AND SHEET METAL. Flashing shall be supplied in a continuous sheet extending from the exterior sheathing across the cavity and through the masonry veneer as shown.

2.13 STEEL LINTELS AND SHELF ANGLES

Steel shapes used for lintels conform to ASTM A 36. Lintels angles shall be provided as shown. These steel members shall be hot-dip galvanized in accordance with ASTM A 123.

2.14 CAULKING AND SEALANTS

Caulking and sealants shall be as specified in Section 07920 JOINT SEALANTS.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

Wall sections, types of construction and dimensions shall be as shown. Metal door and window frames and other special framing shall be built and anchored into the wall system as indicated. The Contractor shall submit Calculations as specified in the Submittals paragraph.

3.2 STEEL STUD WALL FRAMING

The top track of the stud wall system shall be slip jointed to accommodate vertical deflections of the supporting members as shown on the drawings. Top and bottom tracks shall be securely anchored to resist track rotation by alternating fastener locations to provide two rows, one row near each track flange as shown on the drawings. Both flanges of all steel studs shall be securely fastened with screws to the flanges of the top and bottom tracks as shown on the drawings. All details for affixing steel studs to runners and all other sheet steel framing members along with all details necessary for anchorage of the steel stud wall system to the building structural systems shall be as shown on the drawings. Horizontal bridging shall be provided as necessary. Studs shall be spaced 16 inches on center. Coordinate stud spacing with sheathing and anchor requirements. At wall openings for doors, windows and other similar features, the framing system

shall provide for the installation and anchorage of the required subframes or finish frames. Steel frames shall be securely attached through built-in anchors to the nearest stud on each side of the opening with self-drilling screws. Double studs shall be provided at both jambs of all door openings. Door frames and other built-in items shall be grouted solid.

3.3 STEEL SHELF ANGLES

Unless otherwise shown, steel shelf angles shall be provided in segments that do not exceed 10 feet in length. At building corners, shelf angle segments shall be mitered and securely attached together by welding with legs no less than 4 feet where possible. Shelf angle segments shall not be connected together but instead shall be installed with 1/4 inch wide gaps between the segments. Fabrication and erection tolerances shall be in accordance with the AISC Code of Standard Practice, as indicated in AISC 316.

3.4 INSULATION

The actual installed thickness of insulation shall provide a maximum thermal R of 19 for the completed exterior wall construction as determined in accordance with ASHRAE Hdbk-IP. Insulation thickness shall be as shown on the approved drawings. Installation, except as otherwise specified or shown, shall be in accordance with the manufacturer's instructions which shall be approved by the Contracting Officer. Insulation shall be installed between wall framing members. Insulation with facings shall be secured to the sides of the framing members to provide a continuous seal so that the entire weight of the insulation is carried by the framing members. Where electrical outlets, ducts, pipes, vents or other utility items occur, insulation shall be placed on the dry side of the item away from excessive humidity.

3.5 GYPSUM WALLBOARD

Gypsum wallboard shall be installed on the interior face of the cold-formed steel framing system. Installation shall be as specified in Section 09250 GYPSUM BOARD except at vertical slip joints, the gypsum wallboard shall be connected to the vertical studs to prevent movement at the slip joint.

3.6 EXTERIOR SHEATHING

Sheathing shall be installed on the exterior face of the cold-formed steel framing system with self-drilling screws. Screws shall be located a minimum of 3/8 inch from the ends and edges of sheathing panels and shall be spaced not more than 8 inches on each supporting member except at vertical slip joints, the sheathing shall be connected to the vertical studs to prevent movement of the slip joint. Edges and ends of gypsum sheathing panels shall be butted snugly with vertical joints staggered to provide full and even support for the moisture barrier. Holes and gaps resulting from abandoned screw installations, from damage to panels, and from cutting and fitting of panels at junctures with doors, windows, foundation walls, floor slabs and other similar locations shall be filled with exterior rubber-base sealant.

3.7 MOISTURE PROTECTION

3.7.1 Moisture Barrier

The asphalt-saturated felt or other approved moisture barrier shall be installed on the outer face of the exterior sheathing. The moisture

barrier shall be installed horizontally and shingled with each sheet lapped not less than 6 inches over the sheet below. Vertical end joints shall be lapped not less than 6 inches and shall be staggered. Attachment of the moisture barrier shall be with staples spaced not greater than 16 inches on center or as required by the manufacturer.

3.7.2 Vapor Retarder

A vapor retarder shall be installed between the steel studs and the gypsum wall board. The vapor retarder shall be installed in accordance with the manufacturer's recommendations to form a complete retarder to vapor infiltration. The joints shall be lapped and sealed with tape.

3.8 VENEER ANCHORS

Veneer anchors shall be attached with screws through the sheathing to the steel studs or other support members at the locations shown. Veneer anchors shall be installed with the outermost wires lying between 5/8 inch from each face of the masonry veneer. Synthetic rubber washers shall be used between the anchor connector plates and the moisture barrier. A clutch torque slip screw gun shall be used on screws attaching veneer anchors to cold-formed steel members. Veneer anchors with corrugated sheet metal or wire mesh members extending across the wall cavity shall not be used. There shall be one veneer anchor for each two square feet of wall and shall be attached to steel studs and other supports with a maximum spacing of 24 inches on center. For pintle-eye anchors the vertical distance between the pintle section horizontal wires and the eye section horizontal wires shall not exceed 1/2 inch.

3.9 FLASHING

Continuous flashing shall be provided at the bottom of the wall cavity just above grade. Flashing shall also be provided above and below openings at lintels and sills, at shelf angles, and as indicated on the drawings. Flashing shall be as detailed and as specified in Section 07600 FLASHING AND SHEET METAL. Flashing shall be lapped a minimum of 6 inches at joints and shall be sealed with a mastic as recommended by the flashing manufacturer. Ends over doors, windows and openings shall be turned up and secured. Flashing shall be lapped under the moisture barrier a minimum of 6 inches and securely attached to the gypsum sheathing. Flashing shall extend to the exterior face of the masonry veneer joint.

3.10 MASONRY VENEER

Exterior masonry wythes shall be constructed to the thickness indicated on the drawings. A cavity air space shall be provided between the moisture barrier and the masonry veneer. Masonry veneer shall not be installed until the exterior sheathing, moisture barrier, veneer anchors and flashing have been installed on the cold-formed steel framing system. Extreme care shall be taken to avoid damage to the moisture barrier and flashing during construction of the masonry veneer. Any portion of the moisture barrier and flashing that is damaged shall be repaired or replaced prior to completion of the veneer. Masonry shall be placed in running bond pattern.

Vertical joints on alternating courses shall be aligned and kept vertically plumb. Solid masonry units shall be laid in a non-furrowed full bed of mortar, beveled and sloped toward the center of the wythe on which the mortar is placed. Units shall be shoved into place so that the vertical mortar joints are completely full and tight. Units that have been disturbed after the mortar has stiffened shall be removed, cleaned and

relaid. Mortar which protrudes more than 1/2 inch into the cavity space shall be removed. Means shall be provided to ensure that the cavity space is kept clean of mortar droppings and other loose debris. Chases and raked-out joints shall be kept free from mortar and debris. Faces of units used in finished exposed areas shall be free from chipped edges, material texture or color defects or other imperfections distracting from the appearance of the finished work.

3.10.1 Surface Preparation

Surfaces on which masonry is to be laid shall be cleaned of laitance or other foreign material. No units having a film of water shall be laid.

3.10.2 Hot Weather Construction

Temperatures of masonry units and mortar shall not be greater than 120 degrees F when laid. Masonry erected when the ambient air temperature is more than 99 degrees F in the shade and when the relative humidity is less than 50 percent shall be given protection from the direct exposure to wind and sun for 48 hours after the installation.

3.10.3 Cold Weather Construction

Temperatures of masonry units and mortar shall not be less than 40 degrees F when laid. When the ambient air temperature is 32 degrees F or less, masonry veneer under construction shall be protected and maintained at a temperature greater than 32 degrees F for a period of 48 hours after installation. The proposed method of maintaining the temperature within the specified range shall be submitted for approval prior to implementation. No units shall be laid on a surface having a film of frost or water.

3.10.4 Tolerances

Masonry shall be laid plumb, level and true to line within the tolerances specified in TABLE 1. All masonry corners shall be square unless otherwise indicated on the drawings.

TABLE 1

Variation From Plumb	
In adjacent units	1/8 inch
In 10 feet	1/4 inch
In 20 feet	3/8 inch
In 40 feet or more	1/2 inch

Variation From Level Or Grades	
In 10 feet	1/8 inch
In 20 feet	1/4 inch
In 40 feet or more	1/2 inch

Variation From Linear Building Lines

In 20 feet	1/2 inch
In 40 feet or more	3/4 inch

Variation From Cross Sectional Dimensions Of Walls

Plus	1/2 inch
Minus	1/4 inch

3.10.5 Mixing of Mortar

Mortar shall be mixed in a mechanically operated mortar mixer for at least 3 minutes but not more than 5 minutes. Measurement of ingredients for mortar shall be by volume. Measurement of sand shall be accomplished by the use of a container of known capacity or shovel count based on a container of known capacity. Water shall be mixed with the dry ingredients in sufficient amount to provide a workable mixture which will adhere to the vertical surfaces of the masonry units. Mortar that has stiffened because of loss of water through evaporation shall be retempered by adding water to restore the proper consistency and workability. Mortar that has reached its initial set or that has not been used within 2-1/2 hours shall be discarded. Pre-Mixed mortar is acceptable.

3.10.6 Cutting and Fitting

Wherever possible, full units shall be used in lieu of cut units. Where cut units are required to accommodate the design, cutting shall be done by masonry mechanics using power masonry saws. Wet-cut units shall be dried to the same surface-dry appearances of uncut units before being placed in the work. Cut edges shall be clean, true and sharp. Openings to accommodate pipes, conduits, and other accessories shall be neatly formed so that framing or escutcheons required will completely conceal the cut edges. Insofar as practicable, all cutting and fitting shall be accomplished while masonry work is being erected.

3.10.7 Masonry Units

When being laid, masonry units shall have suction sufficient to hold the mortar and to absorb water from the mortar, but shall be damp enough to allow the mortar to remain in a plastic state to permit the unit to be leveled and plumbed immediately after being laid without destroying bond. Masonry units with frogging shall be laid with the frog side down and better or face side exposed to view. Masonry units that are cored, recessed or otherwise deformed may be used in sills or in other areas except where deformations will be exposed to view.

3.10.8 Mortar Joints

Mortar joint widths shall be uniform and such that the specified widths are maintained throughout. Joints shall be of thickness equal to the difference between the actual and nominal dimensions of the masonry units in either height or length but in no case shall the joints be less than 1/4 inch nor more than 1/2 inch wide. Joints shall be tooled slightly concave. Tooling shall be accomplished when mortar is thumbprint hard and in a manner that will compress and seal the mortar joint and produce joints of straight and true lines free of tool marks.

3.10.9 Joint Reinforcement

Unless otherwise shown, joint reinforcement shall be spaced at 16 inches on center vertically. Joint reinforcement shall not be placed in the same masonry course as veneer anchors unless the anchors are designed to accommodate the wire. Joint reinforcement shall be placed so that longitudinal wires are centered in the veneer wythe for solid units. Longitudinal wires shall be fully embedded in mortar for their entire length. Splices in joint reinforcement shall be lapped a minimum of 6 inches. Joint reinforcement must be discontinuous at all veneer joints. The minimum cover for joint reinforcement is 5/8 inches.

3.10.10 Veneer Joints

Concrete masonry veneer joints shall be provided at the locations shown on the drawings. Details of joints shall be as indicated on the drawings. Joints shall be clean and free of mortar and shall contain only backer rod and sealant, installed in accordance with Section 07920 JOINT SEALANTS. Horizontal reinforcement shall not extend through the joints.

3.10.11 Weep Holes

Weep holes shall be provided at all flashing locations at intervals of 32 inches. Weep holes shall be placed in head joints just above the flashing. Weep holes shall be formed by leaving head joints open . Weep holes shall be kept free of mortar and other obstructions.

3.10.12 Head Joints

Head joints shall be provided near the top of the veneer wythe at the same spacing as the weep holes.

3.10.13 Discontinuous Work

When necessary to temporarily discontinue the work, masonry shall be stepped back for joining when work resumes. Toothing may be used only when specifically approved. Before resuming work, loose mortar shall be removed and the exposed joint shall be thoroughly cleaned. Top of walls subjected to rain or snow shall be covered with nonstaining waterproof covering or membrane when work is not in process. Covering shall extend a minimum of 2 feet down on each side of the wall and shall be held securely in place.

3.10.14 Cleaning

Mortar daubs or splashings shall be completely removed from finished exposed masonry surfaces before they harden or set up. Before completion of the work, defects in mortar joints shall be raked out as necessary, filled with mortar, and tooled to match the adjacent existing mortar in the joints. The proposed cleaning method shall be done on the sample wall panel and the sample panel shall be examined for discoloration or stain. If the sample panel is discolored or stained, the method of cleaning shall be changed to ensure that the masonry surfaces in the structure will not be adversely affected. Masonry surfaces shall not be cleaned, other than removing excess surface mortar, until mortar in joints has hardened. Cleaning shall be accomplished with the use of stiff bristle fiber brushes, wooden paddles, wooden scrapers, or other suitable nonmetallic tools. Concrete masonry unit surfaces shall be dry-brushed at the end of each day's work after any required pointing has been done. Efflorescence or other stains shall be removed in conformance with the recommendations of

the masonry unit manufacturer. After construction and cleaning, masonry surfaces shall be left clean, free of mortar daubs, stain, and discolorations, including scum from cleaning operations, and will have tight mortar joints throughout. Metallic tools and brushes shall not be used for cleaning.

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DIVISION 05 - METALS

SECTION 05090

WELDING, STRUCTURAL

09/98

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SECTION 05090

WELDING, STRUCTURAL
09/98

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC 335	(1989) Specification for Structural Steel Buildings - Allowable Stress Design, Plastic Design

AMERICAN SOCIETY FOR NONDESTRUCTIVE TESTING (ASNT)

ASNT RP SNT-TC-1A	(1996) Recommended Practice SNT-TC-1A

AMERICAN WELDING SOCIETY (AWS)

AWS A2.4	(1998) Standard Symbols for Welding, Brazing and Nondestructive Examination
AWS A3.0	(1994) Standard Welding Terms and Definitions
AWS D1.1	(1998) Structural Welding Code - Steel
AWS Z49.1	(1999) Safety in Welding and Cutting and Allied Processes

1.2 DEFINITIONS

Definitions of welding terms shall be in accordance with AWS A3.0.

1.3 GENERAL REQUIREMENTS

The design of welded connections shall conform to AISC 335 unless otherwise indicated or specified. Material with welds will not be accepted unless the welding is specified or indicated on the drawings or otherwise approved. Welding shall be as specified in this section, except where additional requirements are shown on the drawings or are specified in other sections. Welding shall not be started until welding procedures, inspectors, nondestructive testing personnel, welders, welding operators, and tackers have been qualified and the submittals approved by the Contracting Officer. Qualification testing shall be performed at or near the work site. Each Contractor performing welding shall maintain records of the test results obtained in welding procedure, welder, welding operator, and tacker performance qualifications.

1.3.1 Pre-erection Conference

A pre-erection conference shall be held, prior to the start of the field welding, to bring all affected parties together and to gain a naturally clear understanding of the project and the Welding Procedure Specifications (WPS) (which the Contractor shall develop and submit for all welding, including welding done using prequalified procedures). Attendees shall include all Contractor's welding production and inspection personnel and appropriate Government personnel. Items for discussion could include: responsibilities of various parties; welding procedures and processes to be followed; welding sequence (both within a joint and joint sequence within the building); inspection requirements and procedures, both visual and ultrasonic; welding schedule; fabrication of mock-up model; and other items deemed necessary by the attendees.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Welding Procedure Qualifications; G, AO.
Welder, Welding Operator, and Tacker Qualification.
Inspector Qualification.
Previous Qualifications.
Prequalified Procedures.

Copies of the welding procedure specifications; the procedure qualification test records; and the welder, welding operator, or tacker qualification test records.

SD-06 Test Reports

Quality Control; G, AO.

A quality assurance plan and records of tests and inspections.

1.5 WELDING PROCEDURE QUALIFICATIONS

Except for prequalified (per AWS D1.1) and previously qualified procedures, each Contractor performing welding shall record in detail and shall qualify the welding procedure specification for any welding procedure followed in the fabrication of weldments. Qualification of welding procedures shall conform to AWS D1.1 and to the specifications in this section. Copies of the welding procedure specification and the results of the procedure qualification test for each type of welding which requires procedure qualification shall be submitted for approval. Approval of any procedure, however, will not relieve the Contractor of the sole responsibility for producing a finished structure meeting all the requirements of these specifications. This information shall be submitted on the forms in Appendix E of AWS D1.1. Welding procedure specifications shall be individually identified and shall be referenced on the detail drawings and erection drawings, or shall be suitably keyed to the contract drawings. In case of conflict between this specification and AWS D1.1, this specification governs.

1.5.1 Previous Qualifications

Welding procedures previously qualified by test may be accepted for this contract without requalification if the following conditions are met:

a. Testing was performed by an approved testing laboratory, technical consultant, or the Contractor's approved quality control organization.

b. The qualified welding procedure conforms to the requirements of this specification and is applicable to welding conditions encountered under this contract.

c. The welder, welding operator, and tacker qualification tests conform to the requirements of this specification and are applicable to welding conditions encountered under this contract.

1.5.2 Prequalified Procedures

Welding procedures which are considered prequalified as specified in AWS D1.1 will be accepted without further qualification. The Contractor shall submit for approval a listing or an annotated drawing to indicate the joints not prequalified. Procedure qualification shall be required for these joints.

1.5.3 Retests

If welding procedure fails to meet the requirements of AWS D1.1, the procedure specification shall be revised and requalified, or at the Contractor's option, welding procedure may be retested in accordance with AWS D1.1. If the welding procedure is qualified through retesting, all test results, including those of test welds that failed to meet the requirements, shall be submitted with the welding procedure.

1.6 WELDER, WELDING OPERATOR, AND TACKER QUALIFICATION

Each welder, welding operator, and tacker assigned to work on this contract shall be qualified in accordance with the applicable requirements of AWS D1.1 and as specified in this section. Welders, welding operators, and tackers who make acceptable procedure qualification test welds will be considered qualified for the welding procedure used.

1.6.1 Previous Personnel Qualifications

At the discretion of the Contracting Officer, welders, welding operators, and tackers qualified by test within the previous 6 months may be accepted for this contract without requalification if all the following conditions are met:

a. Copies of the welding procedure specifications, the procedure qualification test records, and the welder, welding operator, and tacker qualification test records are submitted and approved in accordance with the specified requirements for detail drawings.

b. Testing was performed by an approved testing laboratory, technical consultant, or the Contractor's approved quality control organization.

c. The previously qualified welding procedure conforms to the requirements of this specification and is applicable to welding conditions

encountered under this contract.

d. The welder, welding operator, and tacker qualification tests conform to the requirements of this specification and are applicable to welding conditions encountered under this contract.

1.6.2 Certificates

Before assigning any welder, welding operator, or tacker to work under this contract, the Contractor shall submit the names of the welders, welding operators, and tackers to be employed, and certification that each individual is qualified as specified. The certification shall state the type of welding and positions for which the welder, welding operator, or tacker is qualified, the code and procedure under which the individual is qualified, the date qualified, and the name of the firm and person certifying the qualification tests. The certification shall be kept on file, and 3 copies shall be furnished. The certification shall be kept current for the duration of the contract.

1.6.3 Renewal of Qualification

Requalification of a welder or welding operator shall be required under any of the following conditions:

a. It has been more than 6 months since the welder or welding operator has used the specific welding process for which he is qualified.

b. There is specific reason to question the welder or welding operator's ability to make welds that meet the requirements of these specifications.

c. The welder or welding operator was qualified by an employer other than those firms performing work under this contract, and a qualification test has not been taken within the past 12 months. Records showing periods of employment, name of employer where welder, or welding operator, was last employed, and the process for which qualified shall be submitted as evidence of conformance.

d. A tacker who passes the qualification test shall be considered eligible to perform tack welding indefinitely in the positions and with the processes for which he is qualified, unless there is some specific reason to question the tacker's ability. In such a case, the tacker shall be required to pass the prescribed tack welding test.

1.7 INSPECTOR QUALIFICATION

Inspector qualifications shall be in accordance with AWS D1.1. Nondestructive testing personnel shall be qualified in accordance with the requirements of ASNT RP SNT-TC-1A for Levels I or II in the applicable nondestructive testing method. The inspector may be supported by assistant welding inspectors who are not qualified to ASNT RP SNT-TC-1A, and assistant inspectors may perform specific inspection functions under the supervision of the qualified inspector.

1.8 SYMBOLS

Symbols shall be in accordance with AWS A2.4, unless otherwise indicated.

1.9 SAFETY

Safety precautions during welding shall conform to AWS Z49.1.

PART 2 PRODUCTS

2.1 WELDING EQUIPMENT AND MATERIALS

All welding equipment, electrodes, welding wire, and fluxes shall be capable of producing satisfactory welds when used by a qualified welder or welding operator performing qualified welding procedures. All welding equipment and materials shall comply with the applicable requirements of AWS D1.1.

PART 3 EXECUTION

3.1 WELDING OPERATIONS

3.1.1 Requirements

Workmanship and techniques for welded construction shall conform to the requirements of AWS D1.1 and AISC 335. When AWS D1.1 and the AISC 335 specification conflict, the requirements of AWS D1.1 shall govern.

3.1.2 Identification

Welds shall be identified in one of the following ways:

a. Written records shall be submitted to indicate the location of welds made by each welder, welding operator, or tacker.

b. Each welder, welding operator, or tacker shall be assigned a number, letter, or symbol to identify welds made by that individual. The Contracting Officer may require welders, welding operators, and tackers to apply their symbol next to the weld by means of rubber stamp, felt-tipped marker with waterproof ink, or other methods that do not cause an indentation in the metal. For seam welds, the identification mark shall be adjacent to the weld at 3 foot intervals. Identification with die stamps or electric etchers shall not be allowed.

3.2 QUALITY CONTROL

Testing shall be done by an approved inspection or testing laboratory or technical consultant; or if approved, the Contractor's inspection and testing personnel may be used instead of the commercial inspection or testing laboratory or technical consultant. The Contractor shall perform visual inspection to determine conformance with paragraph STANDARDS OF ACCEPTANCE. Procedures and techniques for inspection shall be in accordance with applicable requirements of AWS D1.1, except that in radiographic inspection only film types designated as "fine grain," or "extra fine," shall be employed.

3.3 STANDARDS OF ACCEPTANCE

Dimensional tolerances for welded construction, details of welds, and quality of welds shall be in accordance with the applicable requirements of AWS D1.1 and the contract drawings. Nondestructive testing shall be by visual inspection dye penetrant methods. The minimum extent of nondestructive testing shall be random 10 percent of welds or joints, as

indicated on the drawings.

3.3.1 Nondestructive Examination

The welding shall be subject to inspection and tests in the mill, shop, and field. Inspection and tests in the mill or shop will not relieve the Contractor of the responsibility to furnish weldments of satisfactory quality. When materials or workmanship do not conform to the specification requirements, the Government reserves the right to reject material or workmanship or both at any time before final acceptance of the structure containing the weldment.

3.3.2 Destructive Tests

When metallographic specimens are removed from any part of a structure, the Contractor shall make repairs. The Contractor shall employ qualified welders or welding operators, and shall use the proper joints and welding procedures, including peening or heat treatment if required, to develop the full strength of the members and joints cut and to relieve residual stress.

3.4 GOVERNMENT INSPECTION AND TESTING

In addition to the inspection and tests performed by the Contractor for quality control, the Government will perform inspection and testing for acceptance to the extent determined by the Contracting Officer. The costs of such inspection and testing will be borne by the Contractor if unsatisfactory welds are discovered, or by the Government if the welds are satisfactory. The work may be performed by the Government's own forces or under a separate contract for inspection and testing. The Government reserves the right to perform supplemental nondestructive and destructive tests to determine compliance with paragraph STANDARDS OF ACCEPTANCE.

3.5 CORRECTIONS AND REPAIRS

When inspection or testing indicates defects in the weld joints, the welds shall be repaired using a qualified welder or welding operator as applicable. Corrections shall be in accordance with the requirements of AWS D1.1 and the specifications. Defects shall be repaired in accordance with the approved procedures. Defects discovered between passes shall be repaired before additional weld material is deposited. Wherever a defect is removed and repair by welding is not required, the affected area shall be blended into the surrounding surface to eliminate sharp notches, crevices, or corners. After a defect is thought to have been removed, and before rewelding, the area shall be examined by suitable methods to ensure that the defect has been eliminated. Repair welds shall meet the inspection requirements for the original welds. Any indication of a defect shall be regarded as a defect, unless reevaluation by nondestructive methods or by surface conditioning shows that no unacceptable defect is present.

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STRUCTURAL STEEL
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PART 4 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC FCD	(1995a) Quality Certification Program Description
AISC M018L	(1994) LRFD Manual of Steel Construction Volume I
AISC M019L	(1994) LRFD Manual of Steel Construction Volume II
AISC 810	(1997) Erection Bracing of Low-Rise Structural Steel Frames
AISC 316	(1989) ASD Manual of Steel Construction
AISC 317	(1992; Errata 1994) Connections
AISC 325	LRFD Manual of Steel Construction
AISC 326	(2002) Detailing for Steel Construction
AISC 303	(2000) Steel Buildings and Bridges
AISC 348	(2000) Structural Joints Using ASTM A325 or A490 Bolts
AISC 335	(1989) Structural Steel Buildings Allowable Stress Design and Plastic Design
AISC 350	(1999) Load and Resistance Factor Design Specification for Structural Steel Buildings

ASME INTERNATIONAL (ASME)

ASME B46.1	(2002) Surface Texture, (Surface Roughness, Waviness, and Lay)

ASTM INTERNATIONAL (ASTM)

ASTM A 6	(2003) General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling

ASTM A 36	(2002) Carbon Structural Steel
ASTM A 53	(2002) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
ASTM A 123	(2002) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 143	(2003) Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
ASTM A 153	(2003) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 307	(2002) Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
ASTM A 325	(2002) Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM A 490	(2002) Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength
ASTM A 500	(2003) Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A 563	(2000) Carbon and Alloy Steel Nuts
ASTM A 572	(2003) High-Strength Low-Alloy Columbium-Vanadium of Structural Steel
ASTM A 780	(2001) Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM A 992	(2002) Structural Steel Shapes
ASTM C 1107	(2002) Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM C 827	(2001a) Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures
ASTM F 436	(2002) Hardened Steel Washers
ASTM F 844	(2000) Washers, Steel, Plain (Flat), Unhardened for General Use
ASTM F 959	(2002) Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners

AMERICAN WELDING SOCIETY (AWS)

AWS A2.4	(1998) Standard Symbols for Welding, Brazing and Nondestructive Examination
AWS D1.1	(2002) Structural Welding Code - Steel

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC PA 1	(2000) Shop, Field, and Maintenance Painting
SSPC Paint 25	(1997; R 2000) Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II
SSPC PS 13.01	(1982; R 2000) Epoxy-Polyamide Painting System
SSPC SP 3	(1982; R 2000) Power Tool Cleaning
SSPC SP 6	(2000) Commercial Blast Cleaning

1.2 SYSTEM DESCRIPTION

Provide the structural steel system, including shop primer and galvanizing, complete and ready for use. Structural steel systems including design, materials, installation, workmanship, fabrication, assembly, erection, inspection, quality control, and testing shall be provided in accordance with AISC 316 and AISC 317 or AISC 325 except as modified in this contract.

1.3 MODIFICATIONS TO REFERENCES

In AISC 316, AISC 317, AISC 335, AISC 303, and AISC 348, except as modified in this section, shall be considered a part of AISC 316 and AISC 317 and is referred to in this section as AISC 316 and AISC 317.

In AISC 325, AISC 350, AISC 303, and AISC 348, except as modified in this section, shall be considered a part of AISC M018L and AISC M019L and is referred to in this section as AISC 325.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Fabrication drawings including description of connections; G, AE.

SD-03 Product Data

Shop primer

Load indicator washers

Load indicator bolts

Include test report for Class B primer.

SD-06 Test Reports

Class B coating

Bolts, nuts, and washers

Supply the certified manufacturer's mill reports which clearly show the applicable ASTM mechanical and chemical requirements together with the actual test results for the supplied fasteners.

SD-07 Certificates

Steel

Bolts, nuts, and washers

Shop primer

Welding electrodes and rods

Nonshrink grout

Galvanizing

AISC Quality Certification

Welding procedures and qualifications

Regulatory Requirements.

Report stating that the products contain recycled materials and indicating the actual percentages of post-consumer and/or post-industrial recycled materials by weight.

1.5 AISC QUALITY CERTIFICATION

Work shall be fabricated in an AISC certified Category Sbdfabrication plant.

1.6 QUALITY ASSURANCE

1.6.1 Drawing Requirements

Submit fabrication drawings for approval prior to fabrication. Prepare in accordance with AISC 326, AISC 316 and AISC 317. Drawings shall not be reproductions of contract drawings. Include complete information for the fabrication and erection of the structure's components, including the location, type, and size of bolts, welds, member sizes and lengths, connection details, blocks, copes, and cuts. Use AWS A2.4 standard welding symbols.

1.6.2 Certifications

1.6.2.1 Erection Plan

Submit for record purposes. Indicate the sequence of erection, temporary shoring and bracing, and a detailed sequence of welding, including each welding procedure required.

1.6.2.2 Welding Procedures and Qualifications

Prior to welding, submit certification for each welder stating the type of welding and positions qualified for, the code and procedure qualified under, date qualified, and the firm and individual certifying the qualification tests. If the qualification date of the welding operator is more than one-year old, the welding operator's qualification certificate shall be accompanied by a current certificate by the welder attesting to the fact that he has been engaged in welding since the date of certification, with no break in welding service greater than 6 months.

1.7 GENERAL REQURIEMENTS

Contractor shall, as much as possible, select material manufacturers that reduce pollutant and waste, recycle waste, reuse resources and scrap, and reclaim materials instead of disposing into a landfill.

PART 2 PRODUCTS

2.1 STEEL

2.1.1 Structural Steel

ASTM A 36

2.1.2 High-Strength Structural Steel

2.1.2.1 Low-Alloy Steel

ASTM A 572, Grade 50. ASTM A 992 Grade 50.

2.1.3 Structural Shapes for Use in Building Framing

Wide flange shapes, ASTM A 992.

2.1.4 Structural Steel Tubing

ASTM A 500, Grade B.

2.1.5 Steel Pipe

ASTM A 53, Type E or S, Grade B, weight class.

2.2 BOLTS, NUTS, AND WASHERS

Provide the following unless indicated otherwise.

2.2.1 Structural Steel

2.2.1.1 Bolts

ASTM A 307, Grade A; ASTM A 325, Type 1. The bolt heads and the nuts of the supplied fasteners must be marked with the manufacturer's identification mark, the strength grade and type specified by ASTM specifications.

2.2.1.2 Nuts

ASTM A 563, Grade and Style for applicable ASTM bolt standard recommended.

2.2.1.3 Washers

ASTM F 844 washers for ASTM A 307 bolts, and ASTM F 436 washers for ASTM A 325 and ASTM A 490 bolts.

2.2.2 Structural Steel Tubing

2.2.2.1 Bolts

ASTM A 325, Type 1 ASTM A 490, Type 1 or 2.

2.2.2.2 Nuts

ASTM A 563, Grade and Style as specified in the applicable ASTM bolt standard.

2.2.2.3 Washers

ASTM F 436, plain carbon steel.

2.2.3 Foundation Anchorage

2.2.3.1 Bolts

ASTM A 307.

2.2.3.2 Nuts

ASTM A 563, Grade A, hex style.

2.2.3.3 Washers

ASTM F 844.

2.2.4 Load Indicator Washers

ASTM F 959.

2.2.5 Load Indicator Bolts

ASTM A 325, Type 1; ASTM A 490, Type 1, with a manufactured notch between the bolt tip and threads. The bolt shall be designed to react to the opposing rotational torques applied by the installation wrench, with the bolt tip automatically shearing off when the proper tension is obtained.

2.3 STRUCTURAL STEEL ACCESSORIES

2.3.1 Welding Electrodes and Rods

AWS D1.1.

2.3.2 Nonshrink Grout

ASTM C 1107, with no ASTM C 827 shrinkage. Grout shall be nonmetallic.

2.3.3 Welded Shear Stud Connectors

AWS D1.1.

2.4 SHOP PRIMER

SSPC Paint 25, (alkyd primer) or SSPC PS 13.01 epoxy-polyamide, green primer (Form 150) type 1, except provide a Class B coating in accordance with AISC 316 and AISC 317 for slip critical joints. Primer shall conform to Federal, State, and local VOC regulations. If flash rusting occurs, re-clean the surface prior to application of primer.

2.5 GALVANIZING

ASTM A 123 or ASTM A 153, as applicable, unless specified otherwise galvanize after fabrication where practicable.

2.6 FABRICATION

2.6.1 Markings

Prior to erection, members shall be identified by a painted erection mark. Connecting parts assembled in the shop for reaming holes in field connections shall be match marked with scratch and notch marks. Do not locate erection markings on areas to be welded. Do not locate match markings in areas that will decrease member strength or cause stress concentrations. Affix embossed tags to hot-dipped galvanized members.

2.6.2 Shop Primer

Shop prime structural steel, except as modified herein, in accordance with SSPC PA 1. Do not prime steel surfaces embedded in concrete, galvanized surfaces, surfaces to receive sprayed-on fireproofing, or surfaces within 0.5 inch of the toe of the welds prior to welding (except surfaces on which metal decking is to be welded). Slip critical surfaces shall be primed with a Class B coating. Prior to assembly, prime surfaces which will be concealed or inaccessible after assembly. Do not apply primer in foggy or rainy weather; when the ambient temperature is below 45 degrees F or over 95 degrees F; or when the primer may be exposed to temperatures below 40 degrees F within 48 hours after application, unless approved otherwise by the Contracting Officer.

2.6.2.1 Cleaning

SSPC SP 6, except steel exposed in spaces above ceilings, attic spaces, furred spaces, and chases that will be hidden to view in finished construction may be cleaned to SSPC SP 3 when recommended by the shop primer manufacturer. Maintain steel surfaces free from rust, dirt, oil, grease, and other contaminants through final assembly.

2.6.2.2 Primer

Apply primer to a minimum dry film thickness of 2.0 mil except provide the Class B coating for slip critical joints in accordance with the coating manufacturer's recommendations. Repair damaged primed surfaces with an additional coat of primer.

2.6.3 Fireproofing

Surfaces to receive sprayed-on fireproofing coatings shall be cleaned and prepared in accordance with the manufacturer's recommendations.

2.6.4 Surface Finishes

ASME B46.1 maximum surface roughness of 125 for pin, pinholes, and sliding bearings, unless indicated otherwise.

PART 3 EXECUTION

3.1 FABRICATION

Fabrication shall be in accordance with the applicable provisions of AISC 316. Fabrication and assembly shall be done in the shop to the greatest extent possible. The fabricating plant shall be certified under the AISC FCD for Category 1 structural steelwork. Compression joints depending on contact bearing shall have a surface roughness not in excess of 500 micro inches as determined by ASME B46.1, and ends shall be square within the tolerances for milled ends specified in ASTM A 6. Structural steelwork, except surfaces of steel to be encased in concrete, surfaces to be field welded, surfaces to be fireproofed, and contact surfaces of friction-type high-strength bolted connections shall be prepared for painting in accordance with AISC specification for structural steel buildings and primed with the specified paint.

3.2 INSTALLATION

3.3 ERECTION

a: Erection of structural steel, except as indicated in item b. below, shall be in accordance with the applicable provisions of AISC 316, AISC 325 or endorsement F of AISC FCD. Erection plan shall be reviewed, stamped and sealed by a licensed structural engineer.

b. For low-rise structural steel buildings (60 feet tall or less and a maximum of 2 stories), the erection plan shall conform to AISC 303 and the structure shall be erected in accordance withAISC 810.

Provide for drainage in structural steel. After final positioning of steel members, provide full bearing under base plates and bearing plates using nonshrink grout. Place nonshrink grout in accordance with the manufacturer's instructions.

3.3.1 STORAGE

Material shall be stored out of contact with the ground in such manner and location as will minimize deterioration.

3.4 CONNECTIONS

Except as modified in this section, connections not detailed shall be designed in accordance with AISC 335 or AISC 350. Build connections into existing work. Do not tighten anchor bolts set in concrete with impact torque wrenches. Punch, subpunch and ream, or drill bolt holes. Bolts, nuts, and washers shall be clean of dirt and rust, and lubricated immediately prior to installation.

3.4.1 Common Grade Bolts

ASTM A 307 bolts shall be tightened to a "snug tight" fit. "Snug tight" is the tightness that exists when plies in a joint are in firm contact. If firm contact of joint plies cannot be obtained with a few impacts of an impact wrench, or the full effort of a man using a spud wrench, contact the Contracting Officer for further instructions.

3.4.2 High-Strength Bolts

ASTM A 325 and ASTM A 490 bolts shall be fully tensioned to 70 percent of their minimum tensile strength. Provide load indicator bolts or washers in all ASTM A 325 or ASTM A 490 bolted connections, except provide only load indicator washers for slip critical connections. Direct tension indicator tightening, or installation of alternate design fasteners, shall be the only acceptable tightening methods. Use only direct tension indicator tightening for slip critical connections. Bolts shall be installed in connection holes and initially brought to a snug tight fit. After the initial tightening procedure, bolts shall then be fully tensioned, progressing from the most rigid part of a connection to the free edges.

3.4.2.1 Installation of Load Indicator Washers (LIW)

ASTM F 959. Where possible, the LIW shall be installed under the bolt head and the nut shall be tightened. If the LIW is installed adjacent to the turned element, provide a flat ASTM F 436 washer between the LIW and nut when the nut is turned for tightening, and between the LIW and bolt head when the bolt head is turned for tightening. In addition to the LIW, provide flat ASTM F 436 washers under both the bolt head and nut when ASTM A 490 bolts are used.

3.5 WELDING

AWS D1.1. Grind exposed welds smooth as indicated. Provide AWS D1.1 qualified welders, welding operators, and tackers.

The contractor shall develop and submit the Welding Procedure Specifications (WPS) for all welding, including welding done using prequalified procedures. Prequalified procedures may be submitted for information only; however, procedures that are not prequalified shall be submitted for approval.

3.5.1 Removal of Temporary Welds, Run-Off Plates, and Backing Strips

Remove only from finished areas.

3.6 SHOP PRIMER REPAIR

Repair shop primer in accordance with the paint manufacturer's recommendation for surfaces damaged by handling, transporting, cutting, welding, or bolting.

3.6.1 Field Priming

Field priming of steel exposed to the weather, or located in building areas without HVAC for control of relative humidity. After erection, the field bolt heads and nuts, field welds, and any abrasions in the shop coat shall be cleaned and primed with paint of the same quality as that used for the shop coat.

3.7 GALVANIZING REPAIR

Provide as indicated or specified. Galvanize after fabrication where practicable. Repair damage to galvanized coatings using ASTM A 780 zinc rich paint for galvanizing damaged by handling, transporting, cutting, welding, or bolting. Do not heat surfaces to which repair paint has been applied.

3.8 FIELD QUALITY CONTROL

Perform field tests, and provide labor, equipment, and incidentals required for testing, except that electric power for field tests will be furnished as set forth in Division 1. The Contracting Officer shall be notified in writing of defective welds, bolts, nuts, and washers within 7 working days of the date of weld inspection.

3.8.1 Welds

3.8.1.1 Visual Inspection

AWS D1.1. Furnish the services of AWS-certified welding inspectors for fabrication and erection inspection and testing and verification inspections. Welding inspectors shall visually inspect and mark welds, including fillet weld end returns.

3.8.1.2 Nondestructive Testing

AWS D1.1. Test locations shall be selected by the Contracting Officer. If more than 20 percent of welds made by a welder contain defects identified by testing, then all welds made by that welder shall be tested by radiographic or ultrasonic testing, as approved by the Contracting Officer. When all welds made by an individual welder are required to be tested, magnetic particle testing shall be used only in areas inaccessible to either radiographic or ultrasonic testing. Retest defective areas after repair.

a. Testing frequency: Provide the following types and number of tests:

Test Type	Number of Tests
Ultrasonic	5

3.8.2 Load Indicator Washers

3.8.2.1 Load Indicator Washer Compression

Load indicator washers shall be tested in place to verify that they have been compressed sufficiently to provide the 0.015 inch gap when the load indicator washer is placed under the bolt head and the nut is tightened,

and to provide the 0.005 inch gap when the load indicator washer is placed under the turned element, as required by ASTM F 959.

3.8.3 High-Strength Bolts

3.8.3.1 Testing Bolt, Nut, and Washer Assemblies

Test a minimum of 3 bolt, nut, and washer assemblies from each mill certificate batch in a tension measuring device at the job site prior to the beginning of bolting start-up. Demonstrate that the bolts and nuts, when used together, can develop tension not less than the provisions specified in AISC 348 AISC 348, Table 4, depending on bolt size and grade. The bolt tension shall be developed by tightening the nut. A representative of the manufacturer or supplier shall be present to ensure that the fasteners are properly used, and to demonstrate that the fastener assemblies supplied satisfy the specified requirements.

3.8.3.2 Inspection

Inspection procedures shall be in accordance with AISC 348 AISC 348, Section 9. Confirm and report to the Contracting Officer that the materials meet the project specification and that they are properly stored. Confirm that the faying surfaces have been properly prepared before the connections are assembled. Observe the specified job site testing and calibration, and confirm that the procedure to be used provides the required tension. Monitor the work to ensure the testing procedures are routinely followed on joints that are specified to be fully tensioned.

3.8.3.3 Testing

The Government has the option to perform nondestructive tests on 5 percent of the installed bolts to verify compliance with pre-load bolt tension requirements. The nondestructive testing will be done in-place using an ultrasonic measuring device or any other device capable of determining in-place pre-load bolt tension. The test locations shall be selected by the Contracting Officer. If more than 10 percent of the bolts tested contain defects identified by testing, then all bolts used from the batch from which the tested bolts were taken, shall be tested. Retest new bolts after installation.

3.8.4 Testing for Embrittlement

ASTM A 143 for steel products hot-dip galvanized after fabrication.

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SECTION 05210

STEEL JOISTS

12/02

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SECTION 05210

STEEL JOISTS
12/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

STEEL JOIST INSTITUTE (SJI)

SJI Specs & Tables	(August 2002) Standard Specifications and Load Tables for Steel Joists and Joist Girders

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Steel Joists; G, AE.

Detail drawings shall include fabrication and erection details, specifications for shop painting, and identification markings of joists.

SD-07 Certificates

Steel Joists.

Certificates stating that the steel joists have been designed and manufactured in accordance with SJI Specs & Tables. Complete engineering design computations may be submitted in lieu of the certification.

1.3 GENERAL REQUIREMENTS

Steel joists are designated on the drawings in accordance with the standard designations of the Steel Joist Institute. Joists of other standard designations or joists with properties other than those shown may be substituted for the joists designated provided the structural properties are equal to or greater than those of the joists shown and provided all other specified requirements are met.

1.4 DELIVERY AND STORAGE

Materials shall be delivered to the site in undamaged condition and stored off the ground in a well drained location, protected from damage, and easily accessible for inspection and handling.

PART 2 PRODUCTS

2.1 OPEN WEB STEEL JOISTS

Open web steel joists shall conform to SJI Specs & Tables, K-Series. Joists shall be designed to support the loads given in the standard load tables of SJI Specs & Tables.

2.2 ACCESSORIES AND FITTINGS

Accessories and fittings, including end supports and bridging, shall be in accordance with the standard specifications under which the members were designed.

2.3 SHOP PAINTING

Joists and accessories shall be shop painted with a rust-inhibiting primer paint. For joists which will be finish painted under Section 09900 PAINTING, GENERAL, the primer paint shall be limited to a primer which is compatible with the specified finish paint.

PART 3 EXECUTION

3.1 ERECTION

Installation of joists shall be in accordance with the standard specification under which the member was produced. Joists shall be handled in a manner to avoid damage. Damaged joists shall be removed from the site, except when field repair is approved and such repairs are satisfactorily made in accordance with the manufacturer's recommendations. Joists shall be accurately set, and end anchorage shall be in accordance with the standard specification under which the joists were produced. For spans over 40 ft through 60 ft one row of bridging nearest midspan shall be bolted diagonal bridging; for spans over 60 ft bolted diagonal bridging shall be used instead of welded horizontal bridging. Joist bridging and anchoring shall be secured in place prior to the application of any construction loads. Any temporary loads shall be distributed so that the carrying capacity of any joist is not exceeded. Loads shall not be applied to bridging during construction or in the completed work. Abraded, corroded, and field welded areas shall be cleaned and touched up with the same type of paint used in the shop painting.

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10/03

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SECTION 05310

STEEL DECKS
10/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI SG-973	(1996) Cold-Formed Steel Design Manual

ASTM INTERNATIONAL (ASTM)

ASTM A 653	(2001a) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 1008/A 1008M	(2003) Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
ASTM A 780	(2001) Repair of Damaged and Uncoated Areas of Hot-Dipped Galvanized Coatings
ASTM A 792	(2001a) Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1	(2000) Structural Welding Code - Steel
AWS D1.3	(1998) Structural Welding Code - Sheet Steel

FM GLOBAL (FM)

FM DS 1-28	(2002) Design Wind Loads
FM P7825	(2003) Approval Guide

STEEL DECK INSTITUTE (SDI)

SDI 30	(2001) Design Manual for Composite Decks, Form Decks, and Roof Decks
SDI DDM02	(1991) Diaphragm Design Manual
SDI DDP	(1987; R 2000) Deck Damages and Penetration
SDI MOC1	(1992) Manual of Construction with Steel

Deck

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC Paint 20	(2002) Zinc-Rich Coating (Type I - "Inorganic" and Type II - "Organic")

U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 3-310-01	(2000) Load Assumptions for Buildings

UNDERWRITERS LABORATORIES (UL)

UL 209	(1998; Rev thru Mar 2004) Cellular Metal Floor Raceways and Fittings
UL 580	(1994; Rev thru Feb 1998) Tests for Uplift Resistance of Roof Assemblies
UL Bld Mat Dir	(2004) Building Materials Directory

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Fabrication Drawings; G, AE.

SD-03 Product Data

Deck Units.

Sound Absorbing Material.

Accessories.

Mechanical Fasteners

SD-04 Samples

Deck Units.

Accessories.

SD-05 Design Data

Deck Units.

Submit manufacturer's design calculations, or applicable published literature for the structural properties of the proposed deck units.

SD-07 Certificates

Deck Units.

Accessories.

Qualification of Welders.

Fire Safety.

Wind Storm Resistance.

1.3 QUALITY ASSURANCE

1.3.1 Deck Units

Deck units and accessories shall be products of a manufacturer regularly engaged in manufacture of steel decking. Provide a 2 sq ft. sample of decking material and each accessory to be used. Provide manufacturer's certificates attesting that the decking material meets the specified requirements.

1.3.2 Certification of Piston Tool Operator

Manufacturer's certificate attesting that the operators are authorized to use the low velocity piston tool.

1.3.3 Qualification of Welders

Provide welder qualification procedures, welder qualifications, and duration of qualification period in accordance with AWS D1.1 and AWS D1.3.

1.3.4 Regulatory Requirements

1.3.4.1 Fire Safety

Roof deck shall have been tested as a part of a roof deck construction assembly of the type used for this project, shall be listed as fire classified in the UL Bld Mat Dir, or listed as Class I construction in the FM P7825, and so labeled.

1.3.4.2 Wind Storm Resistance

The roof construction assembly shall be capable of withstanding an uplift pressure per contract documents pounds per square foot when tested in accordance with the uplift pressure test described in the FM DS 1-28 or as described in UL 580 and in general compliance with UFC 3-310-01.

1.3.5 Fabrication Drawings

Show type and location of units, location and sequence of connections, bearing on supports, methods of anchoring, attachment of accessories, adjusting plate details, size and location of holes to be cut and reinforcement to be provided, the manufacturer's erection instructions and other pertinent details.

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver deck units to the site in a dry and undamaged condition. Store and handle steel deck in a manner to protect it from corrosion, deformation,

and other types of damage. Do not use decking for storage or as working platform until units have been fastened into position. Exercise care not to damage material or overload decking during construction. The maximum uniform distributed storage load shall not exceed the design live load. Stack decking on platforms or pallets and cover with weathertight ventilated covering. Elevate one end during storage to provide drainage. Maintain deck finish at all times to prevent formation of rust. Repair deck finish using touch-up paint. Replace damaged material.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Steel Sheet

Flat rolled carbon steel sheets of structural quality, meeting the requirements of AISI SG-973, except as modified herein.

2.1.2 Steel Coating

ASTM A 653 designation G60 galvanized, or ASTM A 792 designation AZ55, aluminum-zinc alloy. Apply coating to both sides of sheet. Coating for decking provided as wire raceways shall conform to UL 209.

2.2 ACCESSORIES

Provide accessories of same material as deck, unless specified otherwise. Provide manufacturer's standard type accessories, as specified.

2.2.1 Adjusting Plates

Provide adjusting plates, or segments of deck units, of same thickness and configuration as deck units in locations too narrow to accommodate full size units. Provide factory cut plates of predetermined size where possible.

2.2.2 End Closures

Fabricated of sheet metal by the deck manufacturer. Provide end closures minimum 0.028 inch thick to close open ends at end walls, eaves, and openings through deck.

2.2.3 Partition Closures

Provide closures for closing voids above interior walls and partitions that are perpendicular to the direction of the configurations. Provide rubber, plastic, or sheet steel closures above typical partitions. Provide sheet steel closures above fire-resistant interior walls and partitions located on both sides of wall or partition.

2.2.4 Closure Plates for Composite Deck

The concrete shall be supported and retained at each floor level. Provide edge closures at all edges of the slab of sufficient strength and stiffness to support the wet concrete. Metal closures shall be provided for all openings in composite steel deck 1/4 inch and over.

2.2.5 Sheet Metal Collar

Where deck is cut for passage of pipes, ducts, columns, etc., and deck is to remain exposed, provide a neatly cut sheet metal collar to cover edges of deck. Do not cut deck until after installation of supplemental supports.

2.2.6 Cover Plates

Sheet metal to close panel edge and end conditions, and where panels change direction or butt. Polyethylene-coated, self-adhesive, 2 inch wide joint tape may be provided in lieu of cover plates on flat-surfaced decking butt joints.

2.2.7 Column Closures

Sheet metal, minimum 0.0358 inch thick or metal rib lath.

2.2.8 Access Hole Covers

Sheet metal, minimum 0.0474 inch thick.

2.2.9 Hanger

Provide clips or loops for utility systems and suspended ceilings of one or more of the following types:

a. Slots or holes punched in decking for installation of pigtails.

b. Decking manufacturer's standard as approved by the Contracting Officer.

2.2.10 Miscellaneous Accessories

The manufacturer's standard accessories shall be furnished as necessary to complete the deck installation. Metal accessories shall be of the same material as the deck and have minimum design thickness as follows: saddles, 0.0474 inch; welding washers, 0.0598 inch; cant strip, 0.0295 inch; other metal accessories, 0.0358 inch; unless otherwise indicated. Accessories shall include but not be limited to saddles, welding washers, fasteners, cant strips, butt cover plates, underlapping sleeves, and ridge and valley plates.

2.3 FABRICATION

2.3.1 Deck Units

Deck units shall conform to SDI 30. Form non-cellular decking and accessories shall conform to ASTM A 653, SQ, Grade 230, Grade 33; ASTM A 1008/A 1008M Coated Carbon Steel Sheets, Grade C, 228 mPa, 33, 000 psi minimum yield strength; or ASTM A 792 Coated Steel Sheets, Grade 33. Panels of maximum possible lengths shall be used to minimize end laps. Deck units shall be fabricated in lengths to span 3 or more supports with flush, telescoped, or nested 2 inchlaps at ends, and interlocking, or nested side laps, unless otherwise indicated. Deck with cross-sectional configuration differing from the units indicated may be used, provided that the properties of the proposed units, determined in accordance with AISI SG-973, are equal to or greater than the properties of the units indicated and that the material will fit the space provided without requiring revisions to adjacent materials or systems.

2.3.2 Roof Deck

Deck used in conjunction with insulation and built-up roofing shall conform to ASTM A 792 or ASTM A 1008/A 1008M. Roof deck units shall be fabricated of the steel design thickness required by the design drawings and shall be zinc-coated in conformance with ASTM A 653, G90 coating class or aluminum-zinc coated in accordance with ASTM A 792 Coating Designation AZ55.

2.3.3 Shop Priming

Shop prime accessories deck at the factory after coating. Clean surfaces in accordance with the manufacturer's standard procedure followed by a spray, dip or roller coat of rust-inhibitive primer, oven cured. Provide shop primer compatible with field applied finish painting, as specified in Section 09900, "Paints and Coatings."

2.3.4 Touch-Up Paint

Touch-up paint for shop-painted units shall be of the same type used for the shop painting, and touch-up paint for zinc-coated units shall be an approved galvanizing repair paint with a high-zinc dust content. Welds shall be touched-up with paint conforming to SSPC Paint 20 in accordance with ASTM A 780. Finish of deck units and accessories shall be maintained by using touch-up paint whenever necessary to prevent the formation of rust.

PART 3 EXECUTION

3.1 EXAMINATION

Prior to installation of decking units and accessories, examine worksite to verify that as-built structure will permit installation of decking system without modification.

3.2 INSTALLATION

Install steel deck units in accordance with SDI 30 SDI DDM02 and approved shop drawings. Place units on structural supports, properly adjusted, leveled, and aligned at right angles to supports before permanently securing in place. Damaged deck and accessories including material which is permanently stained or contaminated, deformed, or with burned holes shall not be installed. Extend deck units over three or more supports unless absolutely impractical. Report inaccuracies in alignment or leveling to the Contracting Officer and make necessary corrections before permanently anchoring deck units. Locate deck ends over supports only. Do not use unanchored deck units as a work or storage platform. Permanently anchor units placed by the end of each working day. Do not support suspended ceilings, light fixtures, ducts, utilities, or other loads by steel deck unless indicated. Loads shall be distributed by appropriate means to prevent damage.

3.2.1 Attachment

Immediately after placement and alignment, and after correcting inaccuracies, permanently fasten steel deck units to structural supports and to adjacent deck units by welding with normal5/8 inch diameter puddle welds or fastened with screws, powder-actuated fasteners, or pneumatically driven fasteners as indicated on the design drawings and in accordance with manufacturer's recommended procedure and SDI 30. Clamp or weight deck units to provide firm contact between deck units and structural supports

while performing welding or fastening. Anchoring the deck to structural supports with powder-actuated fasteners or pneumatically driven fasteners is prohibited unless other wise indicated on the design drawings. Attachment of adjacent deck units by button-punching is prohibited.

3.2.1.1 Welding

Perform welding in accordance with AWS D1.3 using methods and electrodes recommended by the manufacturers of the base metal alloys being used. Ensure only operators previously qualified by tests prescribed in AWS D1.1 and AWS D1.3 make welds. Immediately recertify, or replace with qualified welders, welders that have passed qualification tests but are producing unsatisfactory welding. Location, size, and spacing of fastening shall be as indicated and shall conform to the recommendations of the Steel Deck Institute and the steel deck manufacturer. Welding washers shall not be used at the connections of the deck to supports. Welding washers shall not be used at sidelaps. Holes and similar defects will not be acceptable. Deck ends shall be lapped 2 inches. All partial or segments of deck units shall be attached to structural supports in accordance with Section 2.5 of SDI DDM02. Shear connectors shall be attached as shown and shall be welded as per AWS D1.1 through the steel deck to the steel member or directly to the steel member. Immediately clean welds by chipping and wire brushing. Heavily coat welds, cut edges and damaged portions of coated finish with zinc-dust paint conforming to ASTM A 780.

3.2.2 Openings

All holes and openings required shall be cut or drilled holes and be coordinated with the drawings, specifications, and other trades. Frame and reinforce openings through the deck in conformance with SDI DDP. Holes and openings 6 to 12 inches across shall be reinforced by 0.0474 inch thick steel sheet at least 12 inches wider and longer than the opening and be fastened to the steel deck at each corner of the sheet and at a maximum of 6 inches on center. Holes and openings larger than 12 inches shall be reinforced by steel channels or angles installed perpendicular to the steel joists and supported by the adjacent steel joists. Steel channels or angles shall be installed perpendicular to the deck ribs and shall be fastened to the channels or angles perpendicular to the steel joists.

3.2.3 Deck Damage

SDI MOC1, for repair of deck damage.

3.2.4 Accessory Installation

3.2.4.1 Adjusting Plates

Install as shown on shop drawings.

3.2.4.2 End Closures

Provide end closure to close open ends of cells at columns, walls, and openings in deck.

3.2.4.3 Closures Above Partitions

Provide for closing voids between cells over partitions that are perpendicular to direction of cells. Provide a one-piece closure strip for partitions 4 inches nominal or less in thickness and two-piece closure

strips for wider partitions. Provide sheet metal closures above fire-rated partitions at both sides of partition with space between filled with fiberglass insulation.

3.2.4.4 Column Closures

Provide for spaces between floor decking and columns which penetrate the deck. Field cut closure plate to fit column in the field and tack weld to decking and columns.

3.2.4.5 Access Hole Covers

Provide to seal holes cut in decking to facilitate welding of decking to structural supports.

3.2.4.6 Hangers

Provide as indicated to support suspended ceilings. Space devices so as to provide one device per 6.25 square feet.

3.2.5 Preparation of Fire-Proofed Surfaces

Deck surfaces, both composite and noncomposite, which are to receive sprayed-on fireproofing, shall be galvanized and shall be free of all grease, mill oil, paraffin, dirt, salt, and other contaminants which impair adhesion of the fireproofing. Any required cleaning shall be done prior to steel deck installation using a cleaning method that is compatible with the sprayed-on fireproofing.

3.3 FIELD QUALITY CONTROL

3.3.1 Decks Not Receiving Concrete

Inspect the decking top surface for distortion after installation. For roof decks not receiving concrete, verify distortion by placing a straight edge across three adjacent top flanges. The maximum allowable gap between the straight edge and the top flanges is 1/16 inch; when gap is more than 1/16 inch, provide corrective measures or replacement. Reinspect decking after performing corrective measures or replacement.

-- End of Section --

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DIVISION 05 - METALS

SECTION 05400

COLD-FORMED METAL FRAMING

10/03

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SECTION 05400

COLD-FORMED METAL FRAMING
10/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI SG-973	(1996) Cold-Formed Steel Design Manual
AISI SG02-1	(2001) Design of Cold-Formed Steel Structural Members

ASTM INTERNATIONAL (ASTM)

ASTM A 123	(2002) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 153	(2001a) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 370	(2002) Mechanical Testing of Steel Products
ASTM A 653	(2002) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM B 633	(1998e1) Electrodeposited Coatings of Zinc on Iron and Steel
ASTM C 955	(2001) Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases
ASTM E 329	(2002) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

AMERICAN WELDING SOCIETY (AWS)

AWS D1.3	(1998) Structural Welding Code - Sheet Steel

SOCIETY OF AUTOMOTIVE ENGINEERS INTERNATIONAL (SAE)

SAE J78	(1998) Steel Self Drilling Tapping Screws

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS TT-P-664	(Rev. D) Primer Coating, Alkyd, Corrosion-Inhibiting, Lead and Chromate Free, VOC-Compliant

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Framing Components; G, AE.

a. Cross sections, plans, and/or elevations showing component types and locations for each framing application; including shop coatings and material thicknesses for each framing component.

b. Connection details showing fastener type, quantity, location, and other information to assure proper installation.

c. Drawings depicting panel configuration, dimensions, components, locations, and construction sequence if the Contractor elects to install prefabricated/prefinished frames.

SD-03 Product Data

Steel studs,joists, tracks, bracing, bridging and accessories.

SD-05 Design Data

Metal framing calculations; G, AO.

SD-07 Certificates

Load-bearing cold-formed metal framing.

Mill certificates or test reports from independent testing agency, qualified in accordance with ASTM E 329, showing that the steel sheet used in the manufacture of each cold-formed component complies with the minimum yield strengths and uncoated steel thickness specified. Test reports shall be based on the results of three coupon tests in accordance with ASTM A 370.

Welds; .

Certified copies of welder qualifications test records showing qualification in accordance with AWS D1.3.

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver materials to job site and store in adequately ventilated, dry locations. Storage area shall permit easy access for inspection and handling. If necessary to store materials outside, stack off the ground,

support on a level platform, and protect from the weather as approved. Handle materials to prevent damage. Finish of the framing members shall be maintained at all times, using an approved high zinc dust content, galvanizing repair paint whenever necessary to prevent the formation of rust. Replace damaged items with new, as directed by the Contracting Officer.

1.4 LOAD-BEARING COLD-FORMED METAL FRAMING

Include top and bottom tracks, bracing, fastenings, and other accessories necessary for complete installation. Framing members shall have the structural properties indicated. Where physical structural properties are not indicated, they shall be as necessary to withstand all imposed loads. Design framing in accordance with AISI SG-973.

1.5 MAXIMUM DEFLECTION

a. Exterior Studs:

Deflection Criteria	Exterior Finish
L/240 or L/360	Synthetic Plaster, Metal Panels
L/360	Cement Plaster, Wood Veneer
L/600	Brick Veneer, Stone Panels

Wall deflections shall be computed on the basis that studs withstand all lateral forces independent of any composite action from sheathing materials. Studs abutting windows or louvers shall also be designed not to exceed 1/4 inch maximum deflection.

b. Floor Joists:

L/360 - Live load only
L/240 - Total load

c. Roof Rafters:

L/240 - Live load only

1.6 QUALITY ASSURANCE

1.6.1 Drawing Requirements

Submit framing components to show sizes, thicknesses, layout, material designations, methods of installation, and accessories.

1.6.2 Design Data Required

Submit metal framing calculations to verify sizes, gages, and spacing of members and connections. Show methods and practices used in installation.

PART 2 PRODUCTS

2.1 STEEL STUDS, JOISTS, TRACKS, BRACING, BRIDGING AND ACCESSORIES

Framing components shall comply with ASTM C 955 and the following.

2.1.1 Studs and Joists of 16 Gage (0.0598 Inch) and Heavier

Galvanized steel, ASTM A 653, SS Grade 50, G60.

2.1.2 Studs and Joists of 18 Gage (0.0478 Inch) and Lighter

Studs and Joists of 18 Gage (0.0478 Inch) and Lighter, Track, and Accessories (All Gages): Galvanized steel, ASTM A 653, SS, Grade 50 33,000 psi G60.

2.1.3 Sizes, Gages, Section Modulus, and Other Structural Properties

Size and gage as indicated. Steel stud deflection shall be limited to L/600 for exterior wall brick veneer construction.

2.2 MARKINGS

Studs and track shall have product markings stamped on the web of the section. The markings shall be repeated throughout the length of the member at a maximum spacing of 4 feet on center and shall be legible and easily read. The product marking shall include the following:

a. An ICBO number.

b. Manufacturer's identification.

c. Minimum delivered uncoated steel thickness.

d. Protective coating designator.

e. Minimum yield strength.

2.3 CONNECTIONS

Screws for steel-to-steel connections shall be self-drilling tapping in compliance with SAE J78 of the type, size, and location as shown on the drawings. Electroplated screws shall have a Type II coating in accordance with ASTM B 633. Screws, bolts, and anchors shall be hot-dipped galvanized in accordance with ASTM A 123 or ASTM A 153 as appropriate. Screws bolts, and anchors shall be hot dipped galvanized in accordance with ASTM A 123 or ASTM A 153 as appropriate.

2.4 PAINT

Ungalvanized steel, if used, shall be thoroughly cleaned, phosphate treated, and coated with corrosion-inhibiting primer, FS TT-P-664.

2.5 PLASTIC GROMMETS

Supply plastic grommets, recommended by stud manufacturer, to protect electrical wires. Prevent metal to metal contact for plumbing pipes.

PART 3 EXECUTION

3.1 FASTENING

Fasten framing members together by welding or by using self-drilling or self-tapping screws. Electrodes and screw connections shall be as required and indicated in the design calculations.

3.1.1 Welds

All welding shall be performed in accordance with AWS D1.3, as modified by AISI SG02-1. All welders, welding operations, and welding procedures shall be qualified according to AWS D1.3. All welds shall be cleaned and coated with rust inhibitive galvanizing paint. Do not field weld materials lighter than 18 gage.

3.1.2 Screws

Screws shall be of the self-drilling self-tapping type, size, and location shown on the drawings. Screw penetration through joined materials shall not be less than three exposed threads. Minimum spacings and edge distances for screws shall be as specified in AISI SG02-1. Screws covered by sheathing materials shall have low profile heads.

3.1.3 Anchors

Anchors shall be of the type, size, and location shown on the drawings.

3.2 INSTALLATION

3.2.1 Tracks

Provide accurately aligned runners at top and bottom of partitions. Anchor tracks as indicated in design calculations. Butt weld joints in tracks or splice with stud inserts. Fasteners shall be at least 3 inches from the edge of concrete slabs.

3.2.2 Studs

Cut studs square and set with firm bearing against webs of top and bottom tracks. Position studs vertically in tracks and space as indicated in design. Do not splice studs. Provide at least two studs at jambs of doors and other openings 2 feet wide or larger. Provide jack studs over openings, as necessary, to maintain indicated stud spacing. Provide tripled studs at corners, positioned to receive interior and exterior finishes. Fasten studs to top and bottom tracks by welding or screwing both flanges to the tracks. Framed wall openings shall include headers and supporting components as shown on the drawings. Headers shall be installed in all openings that are larger than the stud spacing in a wall. In curtain wall construction, provide for vertical movement where studs connect to the structural frame. Provide horizontal bracing in accordance with the design calculations and AISI SG-973, consisting of, as a minimum, runner channel cut to fit between and welded to the studs or hot- or cold-rolled steel channels inserted through cutouts in web of each stud and secured to studs with welded clip angles. Bracing shall be not less than the following:

LOAD	HEIGHT	BRACING
Wind load only	Up to 10 feet	One row at mid-height
	Over 10 feet	Rows 5'-0" o.c. maximum
Axial load	Up to 10 feet	Two rows at 1/3 points
	Over 10 feet	Rows 3'-4" o.c. maximum

3.2.3 Joists and Trusses

Locate each joist or truss directly above a stud. Provide doubled joists under parallel partitions wherever partition length exceeds 1/2 of joist span. Joists shall have at least 2.50 inches of bearing on steel, 4 inches on masonry, and shall be reinforced over bearings where required to prevent web crippling. Splice joists over bearings only. Lap and weld splices as indicated. Provide manufacturer's standard bridging which shall not be less than the following:

CLEAR SPAN	BRIDGING
Up to 14 feet	One row near center
14 to 20 feet	Two rows at 1/3 points
20 to 26 feet	Three rows at 1/4 points
26 to 32 feet	Four rows at 1/5 points

Temporary bracing shall be provided and remain in place until work is permanently stabilized.

3.2.4 Erection Tolerances

a. Framing members which will be covered by finishes such as wallboard, plaster, or ceramic tile set in a mortar setting bed, shall be within the following limits:

(1) Layout of walls and partitions: 1/4 inch from intended position;

(2) Plates and runners: 1/4 inch in 8 feet from a straight line;

(3) Studs: 1/4 inch in 8 feet out of plumb, not cumulative; and

(4) Face of framing members: 1/4 inch in 8 feet from a true plane.

b. Framing members which will be covered by ceramic tile set in dry-set mortar, latex-portland cement mortar, or organic adhesive shall be within the following limits:

(1) Layout of walls and partitions: 1/4 inch from intended position;

(2) Plates and runners: 1/8 inch in 8 feet from a straight line;

(3) Studs: 1/8 inch in 8 feet out of plumb, not cumulative; and

(4) Face of framing members: 1/8 inch in 8 feet from a true plane.

-- End of Section --

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SECTION 05500

MISCELLANEOUS METAL

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-- End of Section Table of Contents --

SECTION 05500

MISCELLANEOUS METAL
01/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ALUMINUM ASSOCIATION (AA)

AA DAF-45	(1997) Designation System for Aluminum Finishes

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 123	(2001) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 653	(2000) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 924	(1999) General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
ASTM E 814	(2000) Fire Tests of Through-Penetration Fire Stops

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1	(2000) Structural Welding Code - Steel

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(1998; Errata 10-98-1) Portable Fire Extinguishers

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

CID A-A-344	(Rev B) Lacquer, Clear Gloss, Exterior, Interior

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Miscellaneous Metal Items; G, AE.

Detail drawings indicating material thickness, type, grade, and class; dimensions; and construction details. Drawings shall include catalog cuts, erection details, manufacturer's descriptive data and installation instructions, and templates. Detail drawings for the following items: Access door and frame.

SD-04 Samples

Miscellaneous Metal Items; G, AE.

Samples of the following items: Access door and frame. Samples shall be full size, taken from manufacturer's stock, and shall be complete as required for installation in the structure. Samples may be installed in the work, provided each sample is clearly identified and its location recorded.

1.3 GENERAL REQUIREMENTS

The Contractor shall verify all measurements and shall take all field measurements necessary before fabrication. Welding to or on structural steel shall be in accordance with AWS D1.1. Items specified to be galvanized, when practicable and not indicated otherwise, shall be hot-dip galvanized after fabrication. Galvanizing shall be in accordance with ASTM A 123, ASTM A 653, or ASTM A 924, as applicable. Exposed fastenings shall be compatible materials, shall generally match in color and finish, and shall harmonize with the material to which fastenings are applied. Materials and parts necessary to complete each item, even though such work is not definitely shown or specified, shall be included. Poor matching of holes for fasteners shall be cause for rejection. Fastenings shall be concealed where practicable. Thickness of metal and details of assembly and supports shall provide strength and stiffness. Joints exposed to the weather shall be formed to exclude water.

1.4 DISSIMILAR MATERIALS

Where dissimilar metals are in contact, or where aluminum is in contact with concrete, mortar, masonry, wet or pressure-treated wood, or absorptive materials subject to wetting, the surfaces shall be protected with a coat of bituminous paint or asphalt varnish.

1.5 WORKMANSHIP

Miscellaneous metalwork shall be well formed to shape and size, with sharp lines and angles and true curves. Drilling and punching shall produce clean true lines and surfaces. Welding shall be continuous along the entire area of contact except where tack welding is permitted. Exposed connections of work in place shall not be tack welded. Exposed welds shall be ground smooth. Exposed surfaces of work in place shall have a smooth finish, and unless otherwise approved, exposed riveting shall be flush. Where tight fits are required, joints shall be milled. Corner joints shall be coped or mitered, well formed, and in true alignment. Work shall be accurately set to established lines and elevations and securely fastened in place. Installation shall be in accordance with manufacturer's installation instructions and approved drawings, cuts, and details.

1.6 ANCHORAGE

Anchorage shall be provided where necessary for fastening miscellaneous metal items securely in place. Anchorage not otherwise specified or indicated shall include slotted inserts made to engage with the anchors, expansion shields, and power-driven fasteners when approved for concrete; toggle bolts and through bolts for masonry; machine and carriage bolts for steel; and lag bolts and screws for wood.

1.7 ALUMINUM FINISHES

Unless otherwise specified, aluminum items shall have standard mill finish. The thickness of the coating shall be not less than that specified for protective and decorative type finishes for items used in interior locations or architectural Class I type finish for items used in exterior locations in AA DAF-45. Items to be anodized shall receive a polished satin finish. Aluminum surfaces to be in contact with concrete during construction shall be protected with a field coat conforming to CID A-A-344.

1.8 SHOP PAINTING

Surfaces of ferrous metal, except galvanized surfaces, shall be cleaned and shop coated with the manufacturer's standard protective coating unless otherwise specified. Surfaces of items to be embedded in concrete shall not be painted. Items to be finish painted shall be prepared according to manufacturer's recommendations or as specified.

PART 2 PRODUCTS

2.1 ACCESS DOORS AND PANELS

Doors and panels shall be flush type unless otherwise indicated. Frames for access doors shall be fabricated of not lighter than 16 gauge steel with welded joints and finished with anchorage for securing into construction. Access doors shall be a minimum of 14 by 20 inches and of not lighter than 14 gauge steel, with stiffened edges, complete with attachments. Access doors shall be hinged to frame and provided with a flush face, screw driver operated latch. Exposed metal surfaces shall have a shop applied prime coat.

2.2 DOWNSPOUT BOOTS

Downspout boots shall be cast iron with receiving bells sized to fit downspouts. Sharp corners, burrs, or other hazardous edges are expressly prohibited and are cause for rejection.

2.3 FIRE EXTINGUISHER CABINETS

Cabinets to be located in fire-rated walls shall be fire-rated type, fabricated in accordance with ASTM E 814, and shall be listed by an approved testing agency for 1- and 2-hour combustible and non-combustible wall systems. The testing agency's seal shall be affixed to each fire-rated cabinet. Cabinets shall be of the recessed type suitable for 10 pound extinguishers. Box and trim shall be of heavy gage rolled steel. Door shall be a rigid frame with full length piano type hinge and double strength (DSA) glass panel. Door and panel shall have the manufacturer's standard white baked enamel finish inside and out. Sharp corners, burrs, or other hazardous edges are expressly prohibited and are cause for

rejection.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

All items shall be installed at the locations shown and according to the manufacturer's recommendations. Items listed below require additional procedures as specified.

3.2 REMOVABLE ACCESS PANELS

A removable access panel not less than 12 by 12 inches shall be installed directly below each valve, flow indicator, damper, or air splitter that is located above the ceiling, other than an acoustical ceiling, and that would otherwise not be accessible.

3.3 INSTALLATION OF DOWNSPOUT BOOTS

Downspouts shall be secured to building through integral lips with appropriate fasteners.

3.4 INSTALLATION OF FIRE EXTINGUISHER CABINETS

Metal fire extinguisher cabinets shall be furnished and installed in accordance with NFPA 10 where shown on the drawings or specified.

-- End of Section --

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SECTION 06100

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SECTION 06100

ROUGH CARPENTRY
02/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN FOREST & PAPER ASSOCIATION (AF&PA)

AF&PA T101	(1991; Supple 1993; Addenda Apr 1997; Supple T02) National Design Specification for Wood Construction
AF&PA T10	(2001) Wood Frame Construction Manual for One- and Two-Family Dwellings

ASTM INTERNATIONAL (ASTM)

ASTM A 307	(2000) Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
ASTM C 518	(2002e1) Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
ASTM C 578	(1995) Rigid, Cellular Polystyrene Thermal Insulation
ASTM C 665	(1998) Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
ASTM D 2898	(1994; R 1999) Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing
ASTM E 84	(2003) Surface Burning Characteristics of Building Materials
ASTM E 154	(1988; R 1999) Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
ASTM E 96	(2000) Water Vapor Transmission of Materials
ASTM F 547	(1977; R 1995) Definitions of Terms Relating to Nails for Use with Wood and Wood-Based Materials

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)

AWPA C2	(2000) Lumber, Timber, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes
AWPA C20	(1999) Structural Lumber Fire-Retardant Pressure Treatment
AWPA C27	(1999) Plywood - Fire-Retardant Pressure Treatment
AWPA C9	(1997) Plywood - Preservative Treatment by Pressure Processes
AWPA M4	(1999) Standard for the Care of Preservative-Treated Wood Products
AWPA P5	(2000) Standards for Waterborne Preservatives

NORTHEASTERN LUMBER MANUFACTURERS ASSOCIATION (NELMA)

NELMA Grading Rules	(1997) Standard Grading Rules for Northeastern Lumber

SOUTHERN PINE INSPECTION BUREAU (SPIB)

SPIB 1003	(1994; Supple 8 thru 11) Standard Grading Rules for Southern Pine Lumber

WEST COAST LUMBER INSPECTION BUREAU (WCLIB)

WCLIB 17	(1996; Supp. VII & VIII) Standard Grading and Dressing Rules for Douglas Fir, Western Hemlock, Western Red Cedar, White Fir, Sitka Spruce Lumber

WESTERN WOOD PRODUCTS ASSOCIATION (WWPA)

WWPA G-5	(1999) Western Lumber Grading Rules 95

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-07 Certificates

Grading and Marking.

Manufacturer's certificates (approved by an American Lumber Standards approved agency) attesting that lumber and material not normally grade marked meet the specified requirements. Certificate of Inspection for grade marked material by an American Lumber Standards Committee (ALSC) recognized inspection agency

prior to shipment.

Insulation.

Certificate attesting that the insulation furnished for the project contains recovered material, and showing an estimated percent of such recovered material.

1.3 DELIVERY AND STORAGE

Materials shall be delivered to the site in undamaged condition, stored off ground in fully covered, well ventilated areas, and protected from extreme changes in temperature and humidity.

PART 2 PRODUCTS

2.1 LUMBER

2.1.1 Grading and Marking

2.1.1.1 Lumber Products

Solid sawn and finger-jointed lumber shall bear an authorized gradestamp or grademark recognized by ALSC, or an ALSC recognized certification stamp, mark, or hammerbrand. Surfaces that are to be exposed to view shall not bear grademarks, stamps, or any type of identifying mark. Hammer marking will be permitted on timbers when all surfaces will be exposed to view.

2.1.1.2 Plywood

Materials shall bear the grademark or other identifying marks indicating grades of material and rules or standards under which produced, including requirements for qualifications and authority of the inspection organization. Surfaces that are to be exposed to view shall not bear grademarks or other types of identifying marks.

2.1.2 Sizes

Lumber and material sizes shall conform to requirements of the rules or standards under which produced. Unless otherwise specified, lumber shall be surfaced on four sides. Unless otherwise specified, sizes indicated are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which the product is produced.

2.1.3 Treatment

Exposed areas of treated wood that are cut or drilled after treatment shall receive a field treatment in accordance with AWPA M4. Items of all-heart material of cedar, cypress, or redwood will not require preservative treatment, except when in direct contact with soil. Except as specified for all-heart material of the previously mentioned species, the following items shall be treated:

a. Wood members in contact with or within 18 inches of soil.

b. Wood members in contact with water.

c. Wood members exposed to the weather.

d. Wood members set into concrete regardless of location.

e. Wood members in contact with concrete that is in contact with soil or water or that is exposed to weather.

2.1.3.1 Lumber

Lumber shall be treated in accordance with AWPA C2 with waterborne preservatives listed in AWPA P5 to a retention level as follows:

a. 0.25 pcf intended for above ground use.

b. 0.40 pcf intended for ground contact and fresh water use.

2.1.3.2 Plywood

Plywood shall be treated in accordance with AWPA C9 with waterborne preservatives listed in AWPA P5 to a retention level as follows:

a. 0.25 pcf intended for above ground use.

b. 0.40 pcf intended for ground contact and fresh water use.

2.1.4 Moisture Content

At the time lumber and other materials are delivered and when installed in the work their moisture content shall be as follows:

a. Treated and Untreated Lumber: 4 inches or less, nominal thickness, 19 percent maximum. 5 inches or more, nominal thickness, 23 percent maximum in a 3 inch perimeter of the timber cross-section.

b. Materials Other Than Lumber: In accordance with standard under which product is produced.

2.1.5 Fire-Retardant Treatment

Fire-retardant treated wood shall be pressure treated in accordance with AWPA C20 for lumber and AWPA C27 for plywood. Material use shall be defined in AWPA C20 and AWPA C27 for Interior Type A and B and Exterior Type. Treatment and performance inspection shall be by an independent and qualified testing agency that establishes performance ratings. Each piece or bundle of treated material shall bear identification of the testing agency to indicate performance in accordance with such rating. Treated materials to be exposed to rain wetting shall be subjected to an accelerated weathering technique in accordance with ASTM D 2898 prior to being tested for compliance with AWPA C20 or AWPA C27. Items to be treated include: All wood products.

2.1.6 Miscellaneous Wood Members

2.1.6.1 Nonstress Graded Members

Members shall include furring, and nailing strips. Members shall be in accordance with TABLE I for the species used. Sizes shall be as follows unless otherwise shown:

Member	Size (inch)
Furring	1 x 2.
Nailing strips	2 inch stock.

2.1.6.2 Blocking

Blocking shall be standard or number 2 grade.

2.2 ACCESSORIES AND NAILS

Markings shall identify both the strength grade and the manufacturer. Accessories and nails shall conform to the following:

2.2.1 Anchor Bolts

ASTM A 307, size as indicated, complete with nuts and washers.

2.2.2 Bolts: Lag, Toggle, and Miscellaneous Bolts and Screws

Type, size, and finish best suited for intended use. Finish options include zinc compounds, cadmium, and aluminum paint impregnated finishes.

2.2.3 Clip Angles

Steel, 3/16 inch thick, size best suited for intended use; or zinc-coated steel or iron commercial clips designed for connecting wood members.

2.2.4 Expansion Shields

Type and size best suited for intended use.

2.2.5 Nails and Staples

ASTM F 547, size and type best suited for purpose; staples shall be as recommended by the manufacturer of the materials to be joined. In general, 8-penny or larger nails shall be used for nailing through 1 inch thick lumber and for toe nailing 2 inch thick lumber; 16-penny or larger nails shall be used for nailing through 2 inch thick lumber. Nails used with treated lumber and sheathing shall be galvanized. Nailing shall be in accordance with the recommended nailing schedule contained in AF&PA T10. N ail size and spacing shall be sufficient to develop an adequate strength for the connection. The connection's strength shall be verified against the nail capacity tables in AF&PA T101. Reasonable judgement backed by experience shall ensure that the designed connection will not cause the wood to split. If a load situation exceeds a reasonable limit for nails, a specialized connector shall be used.

2.3 INSULATION

Thermal resistance of insulation shall be not less than the R-values shown. R-values shall be determined at 75 degrees F in accordance with ASTM C 518. Contractor shall comply with EPA requirements in conformance with Section 01670 RECYCLED / RECOVERED MATERIALS. Insulation shall be the standard product of a manufacturer and factory marked or identified with manufacturer's name or trademark and R-value. Identification shall be on

individual pieces or individual packages. Materials containing more than one percent asbestos will not be allowed.

2.3.1 Batt or Blanket

2.3.1.1 Glass Fiber Batts and Rolls

Glass fiber batts and rolls shall conform to ASTM C 665, Type II kraft faced insulation and a smoke developed rating of 150 or less when tested in accordance with ASTM E 84. Insulation shall have a 10 mil thick, white, puncture resistant woven-glass cloth with vinyl facing on one side. Width and length shall suit construction conditions.

2.3.2 Rigid Insulation

2.3.2.1 Polystyrene Board

Polystyrene board shall be extruded and conform to ASTM C 578, Type IV.

2.4 VAPOR RETARDER

Vapor retarder shall be polyethylene sheeting conforming to ASTM E 154 or other equivalent material. Vapor retarder shall have a maximum vapor permeance rating of 0.5 perms as determined in accordance with ASTM E 96, unless otherwise specified.

PART 3 EXECUTION

3.1 INSTALLATION OF MISCELLANEOUS WOOD MEMBERS

3.1.1 Blocking

Blocking shall be provided as necessary for application of building items. Blocking shall be cut to fit between framing members and rigidly nailed thereto.

3.1.2 Nailers and Nailing Strips

Nailers and nailing strips shall be provided as necessary for the attachment of finish materials.

3.1.3 Furring Strips

Furring strips shall be provided at the locations shown. Furring strips shall be installed at 16 inches on center unless otherwise shown, run in lengths as long as practicable, butt jointed and rigidly secured in place.

3.2 INSTALLATION OF INSULATION

Insulation shall be installed after construction has advanced to a point that the installed insulation will not be damaged by remaining work. For thermal insulation the actual installed thickness shall provide the R-values shown. For acoustical insulation the installed thickness shall be as shown. Insulation shall be installed on the weather side of such items as electrical boxes and water lines. Unless otherwise specified, installation shall be in accordance with the manufacturer's recommendation.

3.3 INSTALLATION OF VAPOR RETARDER

Vapor retarder shall be applied to provide a continuous barrier at window and door frames, and at all penetrations such as electrical outlets and switches, plumbing connections, and utility service penetrations. Joints in the vapor retarder shall be lapped and sealed according to the manufacturer's recommendations.

3.4 TABLES

TABLE I. SPECIES AND GRADE

Grading Rules	Species	Const Standard	No. 2 Comm	No. 2 Board Comm	No. 3 Comm
NELMA Grading Rules					
	Northern White Cedar				X
	Eastern White Pine	X			
	Northern Pine	X			
	Balsam Fir				X
	Eastern Hemlock-Tamarack				X
SPIB 1003					
	Southern Pine		X		
WCLIB 17					
	Douglas Fir-Larch	X			
	Hem-Fir	X			
	Sitka Spruce	X			
	Mountain Hemlock	X			
	Western Cedar	X			
WWPA G-5					
	Douglas Fir-Larch	X			
	Hem-Fir	X			
	Idaho White Pine	X			
	Lodgepole Pine			X	
	Ponderosa Pine			X	
	Sugar Pine			X	
	Englemann Spruce			X	
	Douglas Fir South			X	
	Mountain Hemlock			X	
	Subalpine Fir			X	
	Western Cedar			X	

-- End of Section --

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SECTION 06410

LAMINATE CLAD ARCHITECTURAL CASEWORK

11/01

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-- End of Section Table of Contents --

SECTION 06410

LAMINATE CLAD ARCHITECTURAL CASEWORK
11/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A161.2	(1998) Decorative Laminate Countertops, Performance Standards for Fabricated High Pressure
ANSI A208.1	(1999) Particleboard Mat Formed Woods
ANSI A208.2	(1994) Medium Density Fiberboard (MDF)

ASTM INTERNATIONAL (ASTM)

ASTM D 1037	(1999) Evaluating Properties of Wood-Base Fiber and Particle Panel Materials
ASTM E 84	(2000a) Surface Burning Characteristics of Building Materials
ASTM F 547	(1977; R 1995) Definitions of Terms Relating to Nails for Use with Wood and Wood-Based Materials
ASTM D 523	(1989; R 1999) Specular Gloss

ARCHITECTURAL WOODWORK INSTITUTE (AWI)

AWI Qual Stds	(1999) Architectural Woodwork Quality Standards

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

BHMA A156.11	(2004) Cabinet Locks
BHMA A156.18	(2000) Materials and Finishes
BHMA A156.9	(1994) Cabinet Hardware

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA LD 3	(1995) High-Pressure Decorative Laminates
NEMA LD 3.1	(1995) Performance, Application, Fabrication, and Installation of

High-Pressure Decorative Laminates

WINDOW AND DOOR MANUFACTURERS ASSOCIATION (WDMA)

WDMA I.S. 1-A (1997) Architectural Wood Flush Doors

1.2 GENERAL DESCRIPTION

Work in this section includes laminate clad and wood custom casework cabinets as shown on the drawings and as described in this specification. This Section includes high-pressure laminate surfacing and cabinet hardware. The Contractor shall comply with EPA requirements in accordance with Section 01670 RECYCLED / RECOVERED MATERIALS. All exposed and semi-exposed surfaces, whose finish is not otherwise noted on the drawings or finish schedule, shall be sanded smooth and shall receive a clear finish of polyurethane. Wood finish may be shop finished or field applied in accordance with Section 09900 PAINTING, GENERAL.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. All items designated with a "G", including product literature, calculations, component data, certificates, diagrams, drawings, and samples shall be submitted concurrently in one complete system submittal. Omission of any required submittal item from the package shall be sufficient cause for disapproval of the entire submittal. Unless otherwise indicated in the submittal review commentary, disapproval of any item within the package shall require a re-submittal of the entire system package, in which all deficiencies shall be corrected. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-02 Shop Drawings

Shop Drawings; G-AE.
Installation; G-AE.

Shop drawings showing all fabricated casework items in plan view, elevations and cross-sections to accurately indicate materials used, details of construction, dimensions, methods of fastening and erection, and installation methods proposed. Shop drawing casework items shall be clearly cross-referenced to casework items located on the project drawings. Shop drawings shall include a color schedule of all casework items to include all countertop, exposed, and semi-exposed cabinet finishes to include finish material manufacturer, pattern, and color.

SD-03 Product Data

Wood Materials.
Wood Finishes.
Finish Schedule.

Descriptive data which provides narrative written verification of all types of construction materials and finishes, methods of construction, etc. not clearly illustrated on the submitted shop drawings. Data shall provide written verification of conformance

with AWI Qual Stds for the quality indicated to include materials, tolerances, and types of construction. Both the manufacturer of materials and the fabricator shall submit available literature which describes re-cycled product content, operations and processes in place that support efficient use of natural resources, energy efficiency, emissions of ozone depleting chemicals, management of water and operational waste, indoor environmental quality, and other production techniques supporting sustainable design and products.

SD-04 Samples

Plastic Laminates; G-AE.

Two samples of each plastic laminate pattern and color. Samples shall be a minimum of 5 by 7 inches in size.

Cabinet Hardware; G-AE.

One sample of each cabinet hardware item specified to include hinges, pulls, and drawer glides.

Hardwood

Two samples of each species and cut, finished on one side and one edge, 4 by 6 inches in size.

SD-07 Certificates

Quality Assurance.
Laminate Clad Casework.

A quality control statement which illustrates compliance with and understanding of AWI Qual Stds requirements, in general, and the specific AWI Qual Stds requirements provided in this specification. The quality control statement shall also certify a minimum of ten years contractor's experience in casework fabrication and construction. The quality control statement shall provide a list of a minimum of five successfully completed projects of a similar scope, size, and complexity.

Local Materials

Report stating which products and their quantities by cost which were manufactured within 500 miles of the project.

1.4 QUALITY ASSURANCE

Unless otherwise noted on the drawings, all materials, construction methods, and fabrication shall conform to and comply with the premium grade quality standards as outlined in AWI Qual Stds. These standards shall apply in lieu of omissions or specific requirements in this specification. Contractors and their personnel engaged in the work shall be able to demonstrate successful experience with work of comparable extent, complexity and quality to that shown and specified. Contractor must demonstrate knowledge and understanding of AWI Qual Stds requirements for the quality grade indicated.

1.5 MOCK-UP

Prior to final approval of shop drawings, a full-size mock-up shall be provided of a typical diaper changing cabinet The mock-up shall include all components and hardware necessary to illustrate a completed unit and shall include a minimum of one door and one drawer assembly. The completed mock-up shall include countertops and back splashes where specified. The mock-up shall utilize specified finishes in the patterns and colors as indicated on the drawings. Upon disapproval, the Contractor shall rework or remake the mock-up until approval is secured. Rejected units shall be removed from the jobsite. Approved mock-up may remain as part of the finished work.

1.6 DELIVERY AND STORAGE

Casework may be delivered knockdown or fully assembled. All units shall be delivered to the site in undamaged condition, stored off the ground in fully enclosed areas, and protected from damage. The storage area shall be well ventilated and not subject to extreme changes in temperature or humidity.

1.7 SEQUENCING AND SCHEDULING

Work shall be coordinated with other trades. Units shall not be installed in any room or space until painting, and ceiling installation are complete within the room where the units are located. Floor cabinets shall be installed before finished flooring materials are installed.

1.8 PROJECT/SITE CONDITIONS

Where wood work is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoided delaying the Work.

1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed and indicate measurements on Shop Drawings.
2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.9 COORDINATION

1.9.1 Sizes and Locations

Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

1.10 GENERAL REQUIREMENTS

Contractor shall, as mush as possible, select material manufacturers that are located within 500 miles of the project.

PART 2 PRODUCTS

2.1 WOOD MATERIALS

2.1.1 Lumber

All framing lumber shall be kiln-dried Grade III to dimensions as shown on the drawings. Frame front, where indicated on the drawings, shall be nominal 3/4 inch hardwood.

2.1.1.1 Casework

Casework components which are specified to receive a transparent finish shall be Birch hardwood species, plain sawn. AWI grade shall be premium. Location, shape, and dimensions shall be as indicated on the drawings.

2.1.2 Panel Products

2.1.2.1 Plywood

All plywood panels used for framing purposes shall be veneer core hardwood plywood, AWI Qual Stds Grade AA. Nominal thickness of plywood panels shall be as indicated in this specification and on the drawings.

2.1.2.2 Particleboard

All particleboard shall be industrial grade, medium density (40 to 50 pounds per cubic foot), 3/4 inch thick. A moisture-resistant particleboard in grade Type 2-M-2 or 2-M-3 shall be used as the substrate for plastic laminate covered countertops backsplashes and components as located on the drawings and other areas subjected to moisture. Particleboard shall meet the minimum standards listed in ASTM D 1037 and ANSI A208.1.

2.1.2.3 Medium Density Fiberboard

Medium density fiberboard (MDF) shall be an acceptable panel substrate where noted on the drawings. Medium density fiberboard shall meet the minimum standards listed in ANSI A208.2.

2.1.2.4 Composite Wood

Composite wood products shall not contain any added urea formaldehyde resins.

2.2 SOLID POLYMER MATERIAL

Solid surfacing casework components shall conform to the requirements of Section 06650 SOLID POLYMER FABRICATIONS.

2.3 HIGH PRESSURE DECORATIVE LAMINATE (HPDL)

All plastic laminates shall meet the requirements of NEMA LD 3 and ANSI A161.2 for high-pressure decorative laminates. Design, colors, surface finish and texture, and locations shall be as indicated on the drawings. Plastic laminate types and nominal minimum thicknesses for casework components shall be as indicated in the following paragraphs.

2.3.1 Horizontal General Purpose Standard (HGS) Grade

Horizontal general purpose standard grade plastic laminate shall be 0.048 inches (plus or minus 0.005 inches) in thickness. This laminate grade is intended for horizontal surfaces where postforming is not required.

2.3.2 Vertical General Purpose Standard (VGS) Grade

Vertical general purpose standard grade plastic laminate shall be 0.028 inches (plus or minus 0.004 inches) in thickness. This laminate grade is intended for exposed exterior vertical surfaces of casework components where postforming is not required.

2.3.3 Horizontal General Purpose Postformable (HGP) Grade

Horizontal general purpose postformable grade plastic laminate shall be 0.042 inches (plus or minus 0.005 inches) in thithickness. This laminate grade is intended for horizontal surfaces where post forming is required.

2.3.4 Vertical General Purpose Postformable (VGP) Grade

Vertical general purpose postformable grade plastic laminate shall be 0.028 inches (plus or minus 0.004 inches) in thickness. This laminate grade is intended for exposed exterior vertical surfaces of components where postforming is required for curved surfaces.

2.3.5 Horizontal General Purpose Fire Rated (HGF) Grade

Horizontal general purpose fire rated grade plastic laminate shall be 0.048 inches (plus or minus 0.005 inches) in thickness. Laminate grade shall have a class 1, class A fire rating in accordance with ASTM E 84.

2.3.6 Vertical General Purpose Fire Rated (VGF) Grade

Vertical general purpose fire rated grade plastic laminate shall be 0.028 inches (plus or minus 0.004 inches) in thickness. This laminate grade shall have a class 1, class A fire rating in accordance with ASTM E 84.

2.3.7 Cabinet Liner Standard (CLS) Grade

Cabinet liner standard grade plastic laminate shall be 0.020 inches in thickness. This laminate grade is intended for light duty semi-exposed interior surfaces of casework components.

2.3.8 Backing Sheet (BK) Grade

Undecorated backing sheet grade laminate is formulated specifically to be used on the backside of plastic laminated panel substrates to enhance dimensional stability of the substrate. Backing sheet thickness shall be 0.020 inches. Backing sheets shall be provided for all laminated casework components where plastic laminate finish is applied to only one surface of the component substrate.

2.4 THERMOSET DECORATIVE OVERLAYS (MELAMINE)

Thermoset decorative overlays (melamine panels) shall be used for all semi-exposed surfaces.

2.5 EDGE BANDING

Edge banding for casework doors and drawer fronts shall be a tee-mould anchor type with a radiused edge profile. Finished width shall be match thickness of doors and drawer fronts. Color shall be black.

2.6 CABINET HARDWARE

All hardware shall conform to BHMA A156.9, unless otherwise noted, and shall consist of the following components:

2.6.1 Frameless Concealed Hinges (European Type)

BHMA A156.9, B01602, 135 degrees of opening, self-closing.

2.6.2 Flush Pulls

BHMA A156.9, B02201, Oval 3 1/2 x 1 1/2 inches, Color: Black.

2.6.3 Catches

Magnetic catches, BHMA A156.9, B03141.

2.6.4 Adjustable Shelf Standards and Supports

BHMA A156.9, B04071; with shelf rests, B04081 and BHMA A156.9, B04104; with shelf brackets, B04112 as indicated.

2.6.5 Drawer Slides

Side-mounted, full-extension, zinc-plated steel drawer slides with steel ball bearings, BHMA A156.9, B05091, and rated for 100 pounds.

2.6.6 Door Locks

BHMA A156.11, E07121.

2.6.7 Drawer Locks

BHMA A156.11, E07041.

2.6.8 Exposed Hardware Finish

For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.

1. Satin Stainless Steel: BHMA 630.

2.6.9 Concealed Hardware

For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.7 FASTENERS

Nails, screws, and other suitable fasteners shall be the size and type best suited for the purpose and shall conform to ASTM F 547 where applicable.

2.8 ADHESIVES, CAULKS, AND SEALANTS

2.8.1 Adhesives

Adhesives shall be of a formula and type recommended by AWI. Adhesives shall be selected for their ability to provide a durable, permanent bond and shall take into consideration such factors as materials to be bonded, expansion and contraction, bond strength, fire rating, and moisture resistance. Adhesives shall meet local regulations regarding VOC emissions and off-gassing.

2.8.1.1 Wood Joinery

Adhesives used to bond wood members shall be a Type II for interior use polyvinyl acetate resin emulsion. Adhesives shall withstand a bond test as described in WDMA I.S. 1-A.

2.8.1.2 Laminate Adhesive

Adhesive used to join high-pressure decorative laminate to wood shall be adhesive consistant with AWI and laminate manufacturer's recommendations. PVC edgebanding shall be adhered using a polymer-based hot melt glue.

2.8.2 Caulk

Caulk used to fill voids and joints between laminated components and between laminated components and adjacent surfaces shall be clear, 100 percent silicone.

2.8.3 Sealant

Sealant shall be of a type and composition recommended by the substrate manufacturer to provide a moisture barrier at sink cutouts and all other locations where unfinished substrate edges may be subjected to moisture.

2.9 WOOD FINISHES

2.9.1 Quality Standard

Comply with AWI Section 1500, unless otherwise indicated.

2.9.2 General

The entire finish of interior architectural woodwork is specified in this Section, regardless of whether shop applied or applied after installation. The extent to which the final finish is applied at fabrication shop is Contractor's option, except shop apply at least the prime coat before delivery.

2.9.3 Preparations for Finishing

Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.

1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not required backpriming when surfaced with plastic

laminate, backing paper, or thermoset decorative overlay.

2.9.4 Transparent Finish

Comply with requirements indicated below for grade, finish system, staining, and sheen, with sheen measured on 60-degree gloss meter per ASTM D 523:

1. Grade: Premium.
2. AWI Finish System TR-2: Catalyzed lacquer.
3. Staining: None required.
4. Sheen: Satin, 30-50 gloss units.

2.10 ACCCESSORIES

2.10.1 Grommets

Grommets shall be plastic material for cutouts with a diameter of 3 inches. Locations shall be as indicated on the drawings.

2.10.2 Recessed Computer Monitor

Provide hardware to support computer monitor below work surface. Computer screen shall be viewed through an anti-reflective-glass view port in the desk top. Confirm size of monitors with users. Locate as shown on the drawings.

2.10.2.1 Keyboard Drawer

Textured black thermoformed ABS Keyboard Drawer with soft radius edges. Positive inward and five positive outward stop locations. Outward Locking Tabs prevent accidental removal of keyboard Drawer.

2.10.2.2 Monitor Support/Carriage

Manufactured using wireform technology with a combination of 1/4 and 5/16 inch diameter epoxy power coated steel. Injection molded Tracking Blocks and Locking Tabs allow for three way adjustment of the monitor; height, angle, and forward/backward movements. The Security Screws allow the Monitor Support to be locked in position and permits easy forward/backward movements.

2.10.2.3 Anti-Reflective Glass

Anti-Reflective properties reduce the reflection level on the surface of the glass. Tinted (T41 rating) and tempered with screed printed border & graphics. Glass for standard monitors is 18W x 20-1/2D, 1/4 inch thick. Glass for oversized monitors is 21W x 24D, 1/4 inch thick.

2.11 FABRICATION

Fabrication and assembly of components shall be accomplished at the shop site to the maximum extent possible. Construction and fabrication of cabinets and their components shall meet or exceed the requirements for AWI premium grade unless otherwise indicated in this specification. Cabinet style, in accordance with AWI Qual Stds, Section 400-G descriptions, shall be flush overlay. NOTE: No sharp edges will be allowed. Ease edges for all outside corners to 1/8 inch.

2.11.1 Base and Wall Cabinet Case Body

Frame members shall be glued-together, kiln-dried hardwood lumber. Top corners, bottom corners, and cabinet bottoms shall be braced with either hardwood blocks or water-resistant glue and nailed in place metal or plastic corner braces. Cabinet components shall be constructed from the following materials and thicknesses:

a. Body Members (Ends, Divisions, Bottoms, and Tops): 3/4 inch veneer core plywood panel product.

b. Face Frames and Rails: 3/4 inch hardwood lumber.

c. Shelving: 3/4 inch veneer core plywood panel product.

d. Cabinet Backs: 1/4 inch veneer core plywood panel product.

e. Drawer Sides, Backs, and Subfronts: 1/2 inch hardwood lumber.

f. Drawer Bottoms: 1/4 inch veneer core plywood panel product.

g. Door and Drawer Fronts: 3/4-inch particleboard panel product.

2.11.1.1 Joinery Method for Case Body Members

a. Tops, Exposed Ends, and Bottoms.

1) Steel "European" assembly screws (1-1/2 inch from end, 5 inch on center, fasteners will not be visible on exposed parts).

2) Doweled, glued under pressure (approx. 4 dowels per 12 inches of joint).

3) Stop dado, glued under pressure, and either nailed, stapled or screwed (fasteners will not be visible on exposed parts).

4) Spline or biscuit, glued under pressure.

b. Exposed End Corner and Face Frame Attachment.

1) For mitered joint: lock miter or spline or biscuit, glued under pressure (no visible fasteners).

2) For non-mitered joint (90 degree): butt joint glued under pressure (no visible fasteners).

c. Cabinet Backs (Wall Hung Cabinets): Wall hung cabinet backs must not be relied upon to support the full weight of the cabinet and its anticipated load for hanging/mounting purposes. Method of back joinery and hanging/mounting mechanisms should transfer the load to case body members. Fabrication method shall be:

1) Full bound, captured in grooves on cabinet sides, top, and bottom. Cabinet backs for floor standing cabinets shall be side bound, captured in grooves; glued and fastened to top and bottom.

2) Full overlay, plant-on backs with minimum back thickness of 1/2 inchand minimum No. 12 plated (no case hardened) screws spaced a minimum 3 inches on center. Edge of back shall not be exposed on

finished sides. Anchor strips are not required when so attached.

d. Cabinet Backs (Floor Standing Cabinets).

1) Side bound, captured in grooves; glued and fastened to top and bottom.

2) Full overlay, plant-on backs with minimum back thickness of 1/2 inch and minimum No. 12 plated (no case hardened) screws spaced a minimum 3 inches on center. Edge of back shall not be exposed on finished sides. Anchor strips are not required when so attached.

e. Wall Anchor Strips shall be required for all cabinets with backs less than 1/2 inch thick. Strips shall consist of minimum 1/2 inch thick lumber, minimum 2-1/2 inches width; securely attached to wall side of cabinet back - top and bottom for wall hung cabinets, top only for floor standing cabinets.

2.11.2 Cabinet Floor Base

Floor cabinets shall be mounted on a base constructed of nominal 2 inch thick lumber. Base assembly components shall be a moisture-resistant panel product. Finished height for each cabinet base shall be as indicated on the drawings. Bottom edge of the cabinet door or drawer face shall be flush with top of base.

2.11.3 Cabinet Door and Drawer Fronts

Plastic Laminate Clad Door and drawer fronts shall be fabricated from 3/4 inch medium density particleboard or 3/4 inch medium density fiberboard (MDF. Drawer and door fronts of wood cabinets shall be Birch. Door and drawer front edges shall be surfaced with PVC T-mold, color and pattern as indicated on the drawings.

2.11.4 Drawer Assembly

Drawer components shall consist of a removable drawer front, sides, backs, and bottom. Drawer components shall be constructed of the following materials and thicknesses:

a. Drawer Sides and Backs For Transparent Finish: 1/2 inch thick solid hardwood lumber.

b. Drawer Sides and Backs For Laminate Finish: 1/2 inch thick 7-ply hardwood veneer core substrate.

c. Drawer Sides and Back For Thermoset Decorative Overlay (melamine) Finish: 1/2 inch thick medium density particleboard or MDF fiberboard substrate.

d. Drawer Bottom: 1/4 inch thick veneer core panel product for transparent or plastic laminate finish or thermoset decorative overlay melamine panel product.

2.11.4.1 Drawer Assembly Joinery Method

a. Multiple dovetail (all corners) or French dovetail front/dadoed back, glued under pressure.

b. Doweled, glued under pressure.

c. Lock shoulder, glued and pin nailed.

d. Bottoms shall be set into sides, front, and back, 1/4 inch deep groove with a minimum 3/8 inch standing shoulder.

2.11.5 Shelving

Shelving shall be fabricated from 3/4 inch veneer core plywood. All shelving top and bottom surfaces shall be finished with HPDL plastic laminate. Shelf edges shall be finished in a PVC T-mold edgebanding.

2.11.5.1 Shelf Support System

The shelf support system shall be:

a. Recessed (mortised) metal shelf standards. Standards shall be mortised flush with the finishes surface of the cabinet interior side walls, two per side. Standards shall be positioned and spaced on the side walls to provide a stable shelf surface that eliminates tipping when shelf front is weighted. Standards shall be installed and adjusted vertically to provide a level, stable shelf surface when clips are in place.

b. Pin Hole Method. Holes shall be drilled on the interior surface of the cabinet side walls. Holes shall be evenly spaced in two vertical columns The holes in each column shall be spaced at 1 inch increments starting 6 inches from the cabinet interior bottom and extending to within 6 inches of the top interior surface of the cabinet. Holes shall be drilled to provide a level, stable surface when the shelf is resting on the shelf pins. Hole diameter shall be coordinated with pin insert size to provide a firm, tight fit.

2.11.6 Laminate Application

Laminate application to substrates shall follow the recommended procedures and instructions of the laminate manufacturer and NEMA LD 3.1, using tools and devices specifically designed for laminate fabrication and application. Provide a balanced backer sheet (Grade BK) wherever only one surface of the component substrate requires a plastic laminate finish. Apply required grade of laminate in full uninterrupted sheets consistent with manufactured sizes using one piece for full length only, using adhesives specified herein or as recommended by the manufacturer. Fit corners and joints hairline. All laminate edges shall be machined flush, filed, sanded, or buffed to remove machine marks and eased (sharp corners removed). Clean up at easing shall be such that no overlap of the member eased is visible. Fabrication shall conform to NEMA LD 3.1 and ANSI A161.2. Laminate types and grades for component surfaces shall be as follows unless otherwise indicated on the drawings:

a. Base/Wall Cabinet Case Body.

1) Exterior (exposed) surfaces to include exposed and semi-exposed face frame surfaces: HPDL Grade VGS.

2) Interior (semi-exposed) surfaces to include interior back wall, bottom, and side walls: Thermoset Decorative Overlay (melamine).

b. Adjustable Shelving.

1) Top and bottom surfaces: HPDL Grade HGS.

2) All edges: PVC T-mold edgebanding.

c. Fixed Shelving.

1) Top and bottom surfaces: HPDL Grade HGS.

2) Exposed edges: PVC T-mold edgebanding.

d. Door, Drawer Fronts, Access Panels.

1) Exterior (exposed) and interior (semi-exposed) faces: HPDL Grade VGS.

2) Edges: PVC T-mold edgebanding.

e. Drawer Assembly.

All interior and exterior surfaces: Thermoset Decorative Overlay (melamine).

2.11.6.1 Tolerances

Flushness, flatness, and joint tolerances of laminated surfaces shall meet the AWI Qual Stds premium grade requirements.

2.11.7 Finishing

2.11.7.1 Filling

No fasteners shall be exposed on laminated surfaces. All nails, screws, and other fasteners in non-laminated cabinet components shall be countersunk and the holes filled with wood filler consistent in color with the wood species.

2.11.7.2 Sanding

All surfaces requiring coatings shall be prepared by sanding with a grit and in a manner that scratches will not show in the final system.

2.11.7.3 Coatings

Types, method of application and location of casework finishes shall be in accordance with the finish schedule, drawings and Section 09900 PAINTING, GENERAL. All cabinet reveals shall be painted.

PART 3 EXECUTION

3.1 INSTALLATION

Installation shall comply with applicable requirements for AWI Qual Stds premium quality standards. Countertops and fabricated assemblies shall be installed level, plumb, and true to line, in locations shown on the drawings. Cabinets and other laminate clad casework assemblies shall be attached and anchored securely to the floor and walls with mechanical fasteners that are appropriate for the wall and floor construction.

3.1.1 Anchoring Systems

3.1.1.1 Floor

Base cabinets shall utilize a floor anchoring system . Anchoring and mechanical fasteners shall not be visible from the finished side of the casework assembly. Cabinet assemblies shall be attached to anchored bases without visible fasteners . Where assembly abutts a wall surface, anchoring shall include a minimum 1/2 inch thick lumber or panel product hanging strip, minimum 2-1/2 inch width; securely attached to the top of the wall side of the cabinet back.

3.1.1.2 Wall

Cabinet to be wall mounted shall utilize minimum 1/2 inch thick lumber or panel product hanging strips, minimum 2-1/2 inch width; securely attached to the wall side of the cabinet back, both top and bottom.

3.1.2 Hardware

Casework hardware shall be installed in types and locations as indicated on the drawings. Where fully concealed European-style hinges are specified to be used with particleboard or fiberboard doors, the use of plastic or synthetic insertion dowels shall be used to receive 3/16 inch "Euroscrews". The use of wood screws without insertion dowels is prohibited.

3.1.3 Doors, Drawers and Removable Panels

The fitting of doors, drawers and removable panels shall be accomplished within target fitting tolerances for gaps and flushness in accordance with AWI Qual Stds premium grade requirements.

3.1.4 Plumbing Fixtures

Sinks, sink hardware, and other plumbing fixtures shall be installed in locations as indicated on the drawings and in accordance with Section 15400 PLUMBING, GENERAL PURPOSE.

-- End of Section --

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DIVISION 06 - WOOD AND PLASTICS

SECTION 06650

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SECTION 06650

SOLID POLYMER (SOLID SURFACING) FABRICATIONS
10/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A108.1	(1999) Installation of Ceramic Tile; including A108.1A-C, 108.4-.13, 118.1-.10, A136.1
ANSI Z124.3	(1995) Plastic Lavatories
ANSI Z124.6	(1997) Plastic Sinks

ASTM INTERNATIONAL (ASTM)

ASTM D 570	(1998) Water Absorption of Plastics
ASTM D 638	(2002) Tensile Properties of Plastics
ASTM D 696	(1998) Coefficient of Linear Thermal Expansion of Plastics Between Minus 30 degrees C and 30 degrees C With a Vitreous Silica Dilatometer
ASTM D 2583	(1995; R 2001e1) Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
ASTM E 84	(2001) Surface Burning Characteristics of Building Materials
ASTM G 21	(1996; R 2002) Determining Resistance of Synthetic Polymeric Materials to Fungi

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA LD 3	(1995) High Pressure Decorative Laminates

1.2 GENERAL DESCRIPTION

Work in this section includes countertops and interior window sills utilizing solid polymer (solid surfacing) fabrication as shown on the drawings and as described in this specification.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Shop Drawings; G, AE.
Installation; G, AE.

Shop Drawings indicating locations, dimensions, component sizes, fabrication and joint details, attachment provisions, installation details, and coordination requirements with adjacent work.

SD-03 Product Data

Solid polymer material.
Qualifications.
Fabrications.

Product data indicating product description, fabrication information, and compliance with specified performance requirements for solid polymer, joint adhesive, sealants, and heat reflective tape. Both the manufacturer of materials and the fabricator shall submit a detailed description of operations and processes in place that support efficient use of natural resources, energy efficiency, emissions of ozone depleting chemicals, management of water and operational waste, indoor environmental quality, and other production techniques supporting sustainable design and products. Highlight VOC Emissions.

SD-04 Samples

Material; G, AE.

A minimum 4 by 4 inch sample of each color and pattern for approval. Samples shall indicate full range of color and pattern variation. Approved samples shall be retained as a standard for this work.

SD-06 Test Reports

Solid polymer material.

Test report results from an independent testing laboratory attesting that the submitted solid polymer material meets or exceeds each of the specified performance requirements.

SD-07 Certificates

Fabrications.
Qualifications.

Solid polymer manufacturer's certification attesting to fabricator qualification approval.

SD-10 Operation and Maintenance Data

Clean-up; G, AO.

A minimum of six copies of maintenance data indicating manufacturer's care, repair and cleaning instructions. Maintenance video shall be provided,if available. Maintenance kit for matte finishes shall be submitted.

1.4 DELIVERY, STORAGE AND HANDLING

Materials shall not be delivered to project site until areas are ready for installation. Materials shall be stored indoors and adequate precautions taken to prevent damage to finished surfaces. Protective coverings shall be provided to prevent physical damage or staining following installation, for duration of project.

1.5 WARRANTY

Manufacturer's warranty of ten years against defects in materials, excluding damages caused by physical or chemical abuse or excessive heat, shall be provided. Warranty shall provide for material and labor for replacement or repair of defective material for a period of ten years after component installation.

1.6 QUALIFICATIONS

To insure warranty coverage, solid polymer fabricators shall be certified to fabricate by the solid polymer material manufacturer being utilized. All fabrications shall be marked with the fabricator's certification label affixed in an inconspicuous location. Fabricators shall have a minimum of 5 years of experience working with solid polymer materials.

1.7 MOCK-UP

The Contractor shall submit Shop Drawings as specified in the Submittals paragraph, under SD-02. Prior to final approval of shop drawings, a full-size mock-up shall be provided of a typical diaper changing casework where multiple units are required. The mock-up shall include all solid polymer components required to provide a completed unit. The mock-up shall utilize finishes in patterns and colors indicated on the drawings. Should the mock-up not be approved, the Contractor shall re-work or remake it until approval is secured. Rejected units shall be removed from the jobsite. Approved mock-up may remain as part of the finished work.

PART 2 PRODUCTS

2.1 MATERIAL

Solid polymer material shall be a homogeneous filled solid polymer; not coated, laminated or of a composite construction; meeting ANSI Z124.3 and ANSI Z124.6 requirements. Material shall have minimum physical and performance properties specified. Superficial damage to a depth of 0.01 inch shall be repairable by sanding or polishing. Material thickness shall be as indicated on the drawings. In no case shall material be less than 1/4 inch in thickness.

2.1.1 Cast,100 Percent Acrylic Polymer Solid Surfacing Material

Cast, 100 percent acrylic solid polymer material shall be composed of acrylic polymer, mineral fillers, and pigments and shall meet the following minimum performance requirements:

PROPERTY	REQUIREMENT (min. or max.)	TEST PROCEDURE
Tensile Strength	5800 psi (min.)	ASTM D 638
Hardness	55-Barcol Impressor (min.)	ASTM D 2583
Thermal Expansion	.000023 in/in/F (max.)	ASTM D 696
Boiling water Surface Resistance	No Change	NEMA LD 3-3.05
High Temperature Resistance	No Change	NEMA LD 3-3.06
Impact Resistance (Ball drop)		NEMA LD 3-303
1/4" sheet	36", 1/2 lb ball, no failure	
1/2" sheet	140", 1/2 lb ball, no failure	
3/4" sheet	200", 1/2 lb ball, no failure	
Mold & Mildew Growth	No growth	ASTM G 21
Bacteria Growth	No Growth	ASTM G 21
Liquid Absorption (Weight in 24 hrs.)	0.1% max.	ASTM D 570
Flammability		ASTM E 84
Flame Spread	25 max.	
Smoke Developed	30 max	

2.1.2 Acrylic-modified Polymer Solid Surfacing Material

Cast, solid polymer material shall be composed of a formulation containing acrylic and polyester polymers, mineral fillers, and pigments. Acrylic polymer content shall be not less than 5 percent and not more than 10 percent in order to meet the following minimum performance requirements:

PROPERTY	REQUIREMENT (min. or max.)	TEST PROCEDURE
Tensile Strength	4100 psi (min.)	ASTM D 638
Hardness	50-Barcol Impressor (min.)	ASTM D 2583
Thermal Expansion	.000023 in/in/F (max.)	ASTM D 696
Boiling water Surface Resistance	No Change	NEMA LD 3-3.05
High Temperature Resistance	No Change	NEMA LD 3-3.06
Impact Resistance (Ball drop)		NEMA LD 3-303
1/4" sheet	36", 1/2 lb ball, no failure	
1/2" sheet	140", 1/2 lb ball, no failure	
3/4" sheet	200", 1/2 lb ball, no failure	
Mold & Mildew Growth	No growth	ASTM G 21
Bacteria Growth	No Growth	ASTM G 21
Liquid Absorption (Weight in 24 hrs.)	0.6% max.	ASTM D 570
Flammability		ASTM E 84
Flame Spread	25 max.	
Smoke Developed	100 max	

2.1.3 Material Patterns and Colors

Patterns and colors for all solid polymer components and fabrications shall be those indicated on the project drawings. Pattern and color shall occur, and shall be consistent in appearance, throughout the entire depth (thickness) of the solid polymer material.

2.1.4 Surface Finish

Exposed finished surfaces and edges shall receive a uniform appearance. Exposed surface finish shall be matte; gloss rating of 5-20.

2.2 ACCESSORY PRODUCTS

Accessory products, as specified below, shall be manufactured by the solid polymer manufacturer or shall be products approved by the solid polymer manufacturer for use with the solid polymer materials being specified.

Adhesive and sealants shall be as recommended by the manufacturer and comply with local indoor air quality standards, VOC content must be less than the current VOC content limits of SCAQMD Rule #1168.

2.2.1 Seam Adhesive

Seam adhesive shall be a two-part adhesive kit to create permanent, inconspicuous, non-porous, hard seams and joints by chemical bond between solid polymer materials and components to create a monolithic appearance of the fabrication. Adhesive shall be approved by the solid polymer manufacturer. Adhesive shall be color-matched to the surfaces being bonded where solid-colored, solid polymer materials are being bonded together. The seam adhesive shall be clear or color matched where particulate patterned, solid polymer materials are being bonded together.

2.2.2 Panel Adhesive

Panel adhesive shall be neoprene based panel adhesive meeting ANSI A108.1, Underwriter's Laboratories (UL) listed. This adhesive shall be used to bond solid polymer components to adjacent and underlying substrates.

2.2.3 Silicone Sealant

Sealant shall be a mildew-resistant, FDA and UL listed silicone sealant or caulk in a clear formulation. The silicone sealant shall be approved for use by the solid polymer manufacturer. Sealant shall be used to seal all expansion joints between solid polymer components and all joints between solid polymer components and other adjacent surfaces such as walls, floors, ceiling, and plumbing fixtures.

2.3 FABRICATIONS

Components shall be factory or shop fabricated to the greatest extent practical to sizes and shapes indicated, in accordance with approved Shop Drawings and manufacturer's requirements. Factory cutouts shall be provided for sinks, lavatories, and plumbing fixtures where indicated on the drawings. Contours and radii shall be routed to template, with edges smooth. Defective and inaccurate work will be rejected.

2.3.1 Joints and Seams

Joints and seams shall be formed between solid polymer components using manufacturer's approved seam adhesive. Joints shall be inconspicuous in appearance and without voids to create a monolithic appearance.

2.3.2 Edge Finishing

Rout and finish component edges to a smooth, uniform appearance and finish. Edge shapes and treatments, including any inserts, shall be as detailed on the drawings. Rout all cutouts, then sand all edges smooth. Repair or reject defective or inaccurate work.

2.3.3 Counter and Vanity Top Splashes

Backsplashes and end splashes shall be fabricated from 1/2 inch thick solid surfacing material and shall be 4 inches high. Backsplashes and end splashes shall be provided for all counter tops and vanity tops. Backsplashes shall be shop fabricated and be permanently attached.

2.3.3.1 Permanently Attached Backsplash

Permanently attached backsplashes shall be attached with seam adhesive and to form a radiused coved transition from countertop to backsplash.

2.3.3.2 End Splashes

End splashes shall be provided loose for installation at the jobsite after horizontal surfaces to which they are to be attached have been installed.

2.3.4 Window Stools

Window stools shall be fabricated from 1/2 inch thick solid surfacing, solid polymer material. Dimensions, edge shape, and other details shall be as indicated on the drawings.

2.3.5 Counter and Vanity Tops

All solid surfacing, solid polymer counter top and vanity top components shall be fabricated from 1/2 inch thick material. Edge details, dimensions, locations, and quantities shall be as indicated on the Drawings. Counter tops shall be complete with 4 inch high permanently attached with coved transition backsplash and loose endsplashes at all locations . Attach 2 inch wide reinforcing strip of polymer material under each horizontal counter top seam.

2.3.5.1 Counter Top With Sink

A. Stainless Steel or Vitreous China Sink.

Countertops with sinks shall include cutouts to template as furnished by the sink manufacturer. Manufacturer's standard sink mounting hardware for stainless steel or vitreous china installation shall be provided. Seam between sink and counter top shall be sealed with silicone sealant. Sink, faucet, and plumbing requirements shall be in accordance with Section 15400 PLUMBING,GENERAL PURPOSE.

PART 3 EXECUTION

3.1 COORDINATION

In most instances, installation of solid polymer fabricated components and assemblies will require strong, correctly located structural support provided by other trades. To provide a stable, sound, secure installation, close coordination is required between the solid polymer fabricator/installer and other trades to insure that necessary structural wall support, cabinet counter top structural support, proper clearances, and other supporting components are provided for the installation of wall panels, countertops, shelving, and all other solid polymer fabrications to the degree and extent recommended by the solid polymer manufacturer. Contractor shall appropriate staging areas for solid polymer fabrications.

3.2 INSTALLATION

3.2.1 Components

All components and fabricated units shall be installed plumb, level, and rigid. Field joints between solid polymer components to provide a

monolithic appearance shall be made using solid polymer manufacturer's approved seam adhesives, with joints inconspicuous in the finished work. Metal or vitreous china sinks and lavatory bowls shall be attached to counter tops using solid polymer manufacturer's recommended clear silicone sealant and mounting hardware. Solid polymer sinks and bowls shall be installed using a color-matched seam adhesive. Plumbing connections to sinks and lavatories shall be made in accordance with Section 15400 PLUMBING, GENERAL PURPOSE.

3.2.1.1 Loose Counter Top Splashes

Loose splashes shall be mounted in locations as noted on the drawings. Loose splashes shall be adhered to the counter top with a color matched silicone sealant when the solid polymer components are solid colors. Adhesion of particulate patterned solid polymer splashes to counter tops shall utilize a clear silicone sealant.

3.2.2 Silicone Sealant

A clear, silicone sealant or caulk shall be used to seal all expansion joints between solid polymer components and all joints between solid polymer components and other adjacent surfaces such as walls, floors, ceiling, and plumbing fixtures. Sealant bead shall be smooth and uniform in appearance and shall be the minimum size necessary to bridge any gaps between the solid surfacing material and the adjacent surface. Bead shall be continuous and run the entire length of the joint being sealed.

3.2.3 Plumbing

Plumbing connections to sinks and lavatories shall be made in accordance with Section 15400.

3.3 CLEAN-UP

Components shall be cleaned after installation and covered to protect against damage during completion of the remaining project items. Components damaged after installation by other trades will be repaired or replaced at the General Contractor's cost. Component supplier will provide a repair/replace cost estimate to the General Contractor who shall approve estimate before repairs are made. The Contractor shall submit maintenance data as specified in the Submittals paragraph, under SD-10.

-- End of Section --

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SECTION 07416

STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM
11/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI Cold-Formed Mnl	(1996) Cold-Formed Steel Design Manual

ASTM INTERNATIONAL (ASTM)

ASTM A 463	(2000) Steel Sheet, Aluminum-Coated, by the Hot-Dip Process
ASTM A 653	(2000) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 792	(1999) Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
ASTM C 1289	(1998) Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
ASTM C 518	(1998) Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
ASTM D 1308	(1987; R 1998) Effect of Household Chemicals on Clear and Pigmented Organic Finishes
ASTM D 1654	(1992) Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
ASTM D 1970	(1997) Self-Adhering Polymer Modified Bituminous Sheet Materials Use as Steep Roofing Underlayment for Ice Dam Protection
ASTM D 2244	(1995) Calculation of Color Differences from Instrumentally Measured Color Coordinates
ASTM D 2247	(1999) Testing Water Resistance of Coatings in 100% Relative Humidity

ASTM D 2794	(1993; R 1999el) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D 3359	(1997) Measuring Adhesion by Tape Test
ASTM D 4214	(1998) Evaluating Degree of Chalking of Exterior Paint Films
ASTM D 522	(1993a) Mandrel Bend Test of Attached Organic Coatings
ASTM D 5894	(1996) Standard Practice for Cyclic Salt Fog/UV Exposure of Painted Metal, (Alternating Exposures in a Fog/Dry Cabinet and a UV/Condensation Cabinet)
ASTM D 610	(1995) Evaluating Degree of Rusting on Painted Steel Surfaces
ASTM D 714	(1987; R 1994el) Evaluating Degree of Blistering of Paints
ASTM D 968	(1993) Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D 4397	(2002) Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
ASTM E 1592	(1998) Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
ASTM E 84	(2001) Surface Burning Characteristics of Building Materials
ASTM G 154	(2000ae1) Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7	(1998) Minimum Design Loads for Buildings and Other Structures

STEEL JOIST INSTITUTE (SJI)

SJI Specs & Tables	(1994) Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders

1.2 GENERAL REQUIREMENTS

The Contractor shall furnish a commercially available roofing system which satisfies all requirements contained herein and has been verified by load testing and independent design analyses to meet the specified design requirements.

1.2.1 Roof Components and Layering

In general, the SSSMR system shall consist of the following components working from the metal roofing surface down to the metal deck. See drawings for complete descriptions:

Prefinished steel roofing panels on
Slip sheet on
Continuous ice and water barrier on
Thin layer of foil-faced rigid insulation on
Thick layer of unfaced rigid insulation on
Vapor retarder on
Metal deck
Install standard adhesive-backed polystyrene thermal breaks between top of purlin and roofing panel as thermal break.

1.2.2 Structural Standing Seam Metal Roof (SSSMR) System

The SSSMR system covered under this specification shall include the entire roofing system; the standing seam metal roof panels, fasteners, purlins, connectors, roof securement components, and assemblies tested and approved in accordance with ASTM E 1592. In addition, the system shall consist of panel finishes, ice and water barrier, slip sheet, rigid insulation, expansion joints, all accessories, components, and trim and all connections with roof panels. This includes roof penetration items such as vents and curbs exterior gutters and downspouts; eaves, ridge, hip, valley, rake, gable, wall, or other roof system flashings installed and any other components specified within this contract to provide a complete and weathertight roof system.

1.2.3 Factory Rolling of Roof Panels

Roof panels shall be rolled in the factory using fully staged rollers. On-site rolling of roof panels is expressly prohibited.

1.2.4 Manufacturer

The SSSMR system shall be the product of a manufacturer who has been in the practice of manufacturing and designing SSSMR systems for a period of not less than 3 years and has been involved in at least five projects similar in size and complexity to this project.

1.2.5 Installer

The installer shall be certified by the SSSMR system manufacturer to have experience in installing at least three projects that are of comparable size, scope and complexity as this project for the particular roof system furnished. The installer may be either employed by the manufacturer or be an independent installer.

1.3 DESIGN REQUIREMENTS

The design of the SSSMR system shall be provided by the Contractor as a complete system. Members and connections not indicated on the drawings shall be designed by the Contractor. Roof panels, components, transitions, accessories, and assemblies shall be supplied by the same roofing system manufacturer.

1.3.1 Design Criteria

Design criteria shall be in accordance with ASCE 7.

1.3.2 Dead Loads

The dead load shall be the weight of the SSSMR system. Collateral loads such as sprinklers, mechanical and electrical systems, and ceilings shall not be attached to the panels.

1.3.3 Live Loads

1.3.3.1 Concentrated Loads

The panels and anchor clips shall be capable of supporting a 300 pound concentrated load. The concentrated load shall be applied at the panel midspan and will be resisted by a single standing seam metal roof panel assumed to be acting as a beam. The undeformed shape of the panel shall be used to determine the section properties.

1.3.3.2 Uniform Loads

The panels and concealed anchor clips shall be capable of supporting a minimum uniform live load of 20 psf.

1.3.4 Roof Snow Loads

The design roof snow loads shall be as shown on the contract drawings.

1.3.5 Wind Loads

The design wind uplift pressure for the roof system shall be as shown on the contract drawings. The design uplift force for each connection assembly shall be that pressure given for the area under consideration, multiplied by the tributary load area of the connection assembly. The safety factor listed below shall be applied to the design force and compared against the ultimate capacity. Prying shall be considered when figuring fastener design loads.

a. Single fastener in each connection.....3.0

b. Two or more fasteners in each connection...2.25

1.3.6 Thermal Loads

Roof panels shall be free to move in response to the expansion and contraction forces resulting from a total temperature range of 251.6 degrees F during the life of the structure.

1.3.7 Framing Members Supporting the SSSMR System

Any additions/revisions to framing members supporting the SSSMR system to accommodate the manufacturer/fabricator's design shall be the Contractor's responsibility and shall be submitted for review and approval. New or revised framing members and their connections shall be designed in accordance with SJI Specs & Tables. Maximum deflection under applied live load, snow, or wind load shall not exceed 1/180 of the span length.

1.3.8 Roof Panels Design

Steel panels shall be designed in accordance with AISI Cold-Formed Mnl. The structural section properties used in the design of the panels shall be determined using the unloaded shape of the roof panels. The calculated panel deflection from concentrated loads shall not exceed 1/180 of the span length. The calculated panel deflection under applied live load, or wind load shall not exceed 1/180 times the span length. Deflections shall be based on panels being continuous across three or more supports. Deflection shall be calculated and measured along the major ribs of the panels.

1.3.9 Accessories and Their Fasteners

Accessories and their fasteners shall be capable of resisting the specified design wind uplift forces and shall allow for thermal movement of the roof panel system. Exposed fasteners shall not restrict free movement of the roof panel system resulting from thermal forces. There shall be a minimum of two fasteners per clip. Single fasteners with a minimum diameter of 3/8 inch will be allowed when the supporting structural members are prepunched or predrilled.

1.4 PERFORMANCE REQUIREMENTS

The SSSMR shall be tested for wind uplift resistance in accordance with ASTM E 1592; SSSMR systems previously tested and approved by the Corps of Engineers' STANDARD TEST METHOD FOR STRUCTURAL PERFORMANCE OF SSMRS BY UNIFORM STATIC AIR PRESSURE DIFFERENCE may be acceptable. Two tests shall be performed. Test 1 shall simulate the edge condition with one end having crosswise restraint and other end free of crosswise restraint. The maximum span length for the edge condition shall be 30 inches. Test 2 shall simulate the interior condition with both ends free of crosswise restraint. The maximum span length for the interior condition shall be 5.0 feet. External reinforcement, such as clamps on the ribs, shall not be installed to improve uplift resistance. Bolts through seams shall not be installed.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Structural Standing Seam Metal Roof System; G-AO.

Metal roofing drawings and specifications and erection drawings; shop coating and finishing specifications; and other data as necessary to clearly describe design, materials, sizes, layouts, standing seam configuration, construction details, provisions for thermal movement, line of panel fixity, fastener sizes and spacings, sealants and erection procedures. Drawings shall reflect the intent of the architectural detailing using the manufacturer's proprietary products and fabricated items as required. The SSSMR system shop drawings shall be provided by the metal roofing manufacturer.

SD-03 Product Data

Design Analysis; G, AO.

Design analysis signed by a Registered Professional Engineer employed by the SSSMR manufacturer. The design analysis shall include a list of the design loads, and complete calculations for the support system (when provided by the Contractor), roofing system and its components; valley designs, gutter/downspout calculations, screw pullout test results, and shall indicate how expected thermal movements are accommodated.

Qualifications; G, AO.

Qualifications of the manufacturer and installer.

SD-04 Samples

Accessories; G, AO.

One sample of each type of flashing, trim, closure, thermal spacer block, cap and similar items. Size shall be sufficient to show construction and configuration.

Roof Panels; G, AO.

One piece of each type to be used, 9 inches long, full width.

Factory Color Finish; G, AO.

Three 3 by 5 inches samples of each type and color.

Fasteners; G, AO.

Two samples of each type to be used, with statement regarding intended use. If so requested, random samples of bolts, nuts, and washers as delivered to the job site shall be taken in the presence of the Contracting Officer and provided to the Contracting Officer for testing to establish compliance with specified requirements.

Insulation; G, AO.

One piece, 12 by 12 inches, of each type and thickness to be used, with a label indicating the rated permeance (if faced) and R-values. The flame spread, and smoke developed rating shall be shown on the label or provided in a letter of certification.

Gaskets and Insulating Compounds; G, AO.

Two samples of each type to be used and descriptive data.

Sealant; G, AO.

One sample, approximately 1 pound, and descriptive data.

Concealed Anchor Clips; G, AO.

Two samples of each type used.

Subpurlins; G, AO.

One piece, 9 inches long.

EPDM Rubber Boots; G, AO.

One piece of each type.

Ice and Water Shield; G-AO.

One piece, 8 inches by 8 inches.

SD-06 Test Reports

Test Report for Uplift Resistance of the SSSMR; G, AO.

The report shall include the following information:

a. Details of the SSSMR system showing the roof panel cross-section with dimensions and thickness.

b. Details of the anchor clip, dimensions, and thickness.

c. Type of fasteners, size, and the number required for each connection.

d. Purlins/subpurlins size and spacing used in the test.

e. Description of the seaming operation including equipment used.

f. Maximum allowable uplift pressures. These pressures are determined from the ultimate load divided by a factor of safety equal to 1.65.

g. Any additional information required to identify the SSSMR system tested.

h. Signature and seal of an independent registered engineer who witnessed the test.

SD-07 Certificates

Structural Standing Seam Metal Roof System; G, AO.

a. Certification that the actual thickness of uncoated sheets used in SSSMRS components including roofing panels, subpurlins, and concealed anchor clips complies with specified requirements.

b. Certification that materials used in the installation are mill certified.

c. Previous certification of SSSMR system tested under the Corps of Engineers' Standard Test Method in lieu of ASTM E 1592 testing.

d. Certification that the sheets to be furnished are produced under a continuing quality control program and that a

representative sample consisting of not less than three pieces has been tested and has met the quality standards specified for factory color finish.

e. Certification of installer. Installer certification shall be furnished.

f. Warranty certificates. Furnish samples of the 20-year Manufacturer's Material Warranties, the Manufacturer's 20-year System Weathertightness Warranty, and the 5-year bond required by the paragraph titled: Contractor's Weathertightness Warranty. At the completion of the project the Contractor shall furnish signed copies of the 5-year Warranty for Structural Standing Seam Metal Roof (SSSMR) System, a sample copy of which is attached to this section, and the 20-year Manufacturer's Material Warranties, and the manufacturer's 20-year system weathertightness warranty.

Insulation.

Certificate attesting that the polyisocyanurate insulation furnished for the project contains recovered material, and showing an estimated percent of such recovered material.

1.6 DELIVERY AND STORAGE

Materials shall be delivered to the site in a dry and undamaged condition and stored out of contact with the ground. Materials shall be covered with weathertight coverings and kept dry. Storage conditions shall provide good air circulation and protection from surface staining.

1.7 WARRANTIES

The SSSMR system shall be warranted as outlined below. Any emergency temporary repairs conducted by the owner shall not negate the warranties.

1.7.1 Contractor's Weathertightness Warranty

The SSSMR system shall be warranted by the Contractor on a no penal sum basis for a period of five years against material and workmanship deficiencies; system deterioration caused by exposure to the elements and/or inadequate resistance to specified service design loads, water leaks, and wind uplift damage. The SSSMR system covered under this warranty shall include the entire roofing system including, but not limited to, the standing seam metal roof panels, fasteners, purlins, connectors, roof securement components, and assemblies tested and approved in accordance with ASTM E 1592. In addition, the system shall consist of panel finishes, ice and water barrier, slip sheet, rigid insulation, expansion joints, all accessories, components, and trim and all connections with roof panels. This includes roof penetration items such as vents and curbs; exterior gutters and downspouts; eaves, ridge, hip, valley, rake, gable, wall, or other roof system flashings installed and any other components specified within this contract to provide a complete and weathertight roof system; and items specified in other sections of these specifications that are part of the SSSMR system. All material and workmanship deficiencies, system deterioration caused by exposure to the elements and/or inadequate resistance to specified design loads, water leaks and wind uplift damage shall be repaired as approved by the Contracting Officer. See the attached Contractor's required warranty for issue resolution of warrantable defects. This warranty shall warrant and

cover the entire cost of repair or replacement, including all material, labor, and related markups. The Contractor shall supplement this warranty with written warranties from the installer and system manufacturer, which shall be submitted along with Contractor's warranty; however, the Contractor shall be ultimately responsible for this warranty. The Contractor's written warranty shall be as outlined in attached WARRANTY FOR STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM, and shall start upon final acceptance of the facility. It is required that the Contractor provide a separate bond in an amount equal to the installed total roofing system cost in favor of the owner (Government) covering the Contractor's warranty responsibilities effective throughout the five year Contractor's warranty period for the entire SSSMR system as outlined above.

1.7.2 Manufacturer's Material Warranties.

The Contractor shall furnish, in writing, the following manufacturer's material warranties which cover all SSSMR system components such as roof panels, anchor clips and fasteners, flashing, accessories, and trim, fabricated from coil material:

a. A manufacturer's 20 year material warranty warranting that the zinc-coated steel, aluminum-zinc alloy coated steel or aluminum-coated steel as specified herein will not rupture, structurally fail, fracture, deteriorate, or become perforated under normal design atmospheric conditions and service design loads. Liability under this warranty shall be limited exclusively to the cost of either repairing or replacing nonconforming, ruptured, perforated, or structurally failed coil material.

b. A manufacturer's 20 year exterior material finish warranty on the factory colored finish warranting that the finish, under normal atmospheric conditions at the site, will not crack, peel, or delaminate; chalk in excess of a numerical rating of eight, as determined by ASTM D 4214 test procedures; or change color in excess of five CIE or Hunter Lab color difference (delta E) units in accordance with ASTM D 2244. Liability under this warranty is exclusively limited to refinishing with an air-drying version of the specified finish or replacing the defective coated material.

c. A roofing system manufacturer's 20 year system weathertightness warranty.

1.8 COORDINATION MEETING

A coordination meeting shall be held 30 days prior to the first submittal, for mutual understanding of the Structural Standing Seam Metal Roof (SSSMR) System contract requirements. This meeting shall take place at the building site and shall include representatives from the Contractor, the roof system manufacturer, the roofing supplier, the erector, the SSSMR design engineer of record, and the Contracting Officer. All items required by paragraph SUBMITTALS shall be discussed, including applicable standard manufacturer shop drawings, and the approval process. The Contractor shall coordinate time and arrangements for the meeting.

PART 2 PRODUCTS

2.1 ROOF PANELS

Panels shall be steel and shall have a factory color finish. Length of sheets shall be sufficient to cover the entire length of any unbroken roof slope for slope lengths that do not exceed 55 feet., which is approximate

longest transportable panel length. When length of run exceeds 55 feet and panel laps are provided, each sheet in the run shall extend over three or more supports. Width of sheets shall provide not more than 24 inches of coverage in place. SSSMR system shall have standing seams rolled during installation by an electrically driven seaming machine. Height of standing seams shall be not less than 2 inches for all seam types.

2.1.1 Steel Panels

Steel panels shall be zinc-coated steel conforming to ASTM A 653; aluminum-zinc alloy coated steel conforming to ASTM A 792, AZ 50 coating; or aluminum-coated steel conforming to ASTM A 463, Type 2, coating designation T2 65. Zinc, zinc-aluminum alloy or aluminum coated panels shall be 0.023 inch thick minimum. Panels shall be within 95 percent of reported tested thickness as noted in wind uplift resistance testing required in paragraph PERFORMANCE REQUIREMENTS.

2.1.2 Expansion Joints and Panel Connections

Expansion joints and panel connections shall be fabricated of steel and prefinished to match the roofing panels. Expansion joints and panel connections shall be the standard product of the manufacturer and shall allow for the anticipated building joint and roof panel movement. See drawings for details and locations.

2.2 CONCEALED ANCHOR CLIPS

Concealed anchor clips shall be the same as the tested roofing system. Clip bases shall have factory punched or drilled holes for attachment. Clips shall be made from multiple pieces with the allowance for the total thermal movement required to take place within the clip. Single piece clips may be acceptable when the manufacturer can substantiate that the system can accommodate the thermal cyclic movement under sustained live or snow loads.

2.3 ACCESSORIES

Flashing, trim, metal closure strips, caps, gutters and downspouts, and similar metal accessories shall be the same metal type and thickness as the roof panels. Exposed metal accessories shall have the same finish systems as the roof panels. Die cast metal closures shall be installed with double bead tape sealant and fasteners that stitch the panel to a 16 gage preformed backer plate to ensure a positive compression of the tape sealant. The use of a continuous angle butted to the panel ends to form a closure will not be allowed.

2.4 FASTENERS

Fasteners for steel roof panels shall be zinc-coated steel, aluminum, corrosion resisting steel, or nylon capped steel, type and size specified below or as otherwise approved for the applicable requirements. Fasteners for structural connections shall provide both tensile and shear ultimate strengths of not less than 750 pounds per fastener. Fasteners for accessories shall be the manufacturer's standard. Exposed roof fasteners shall be sealed or have sealed washers on the exterior side of the roof to waterproof the fastener penetration. Washer material shall be compatible with the roofing; have a minimum diameter of 3/8 inch for structural connections; and gasketed portion of fasteners or washers shall be neoprene or other equally durable elastomeric material approximately 1/8 inch thick.

Exposed fasteners for factory color finished panels shall be factory finished to match the color of the panels.

2.4.1 Screws

Screws for attaching anchor devices shall be not less than No. 14. Actual screw pull out test results shall be performed for the actual material gage and yield strength of the structural purlins or subpurlins to which the clip is to be anchored/attached. Other screws shall be as recommended by the manufacturer to meet the strength design requirements of the panels.

2.4.2 Bolts

Bolts shall be not less than 1/4 inch diameter, shouldered or plain shank as required, with locking washers and nuts.

2.4.3 Structural Blind Fasteners

Blind screw-type expandable fasteners shall be not less than 1/4 inch diameter. Blind (pop) rivets shall be not less than 9/32 inch minimum diameter.

2.5 SUBPURLINS

Cold formed supporting structural members/subpurlins shall have a minimum thickness of 0.059 inches and a minimum tensile yield strength of 50000 psi. Hot rolled structural members shall have a minimum thickness of 0.25 inches and a minimum tensile yield strength of 36000 psi. Subpurlins shall be either galvanized or shop painted. See drawings for details.

2.6 FACTORY COLOR FINISH

Panels shall have a factory applied polyvinylidene fluoride finish on the exposed side. The exterior finish shall consist of a baked-on topcoat with an appropriate prime coat. Color shall match the color indicated on the drawings. The exterior coating shall be a nominal 1 mil thickness consisting of a topcoat of not less than 0.7 mil dry film thickness and the paint manufacturer's recommended primer of not less than 0.2 mil thickness. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. The exterior color finish shall meet the test requirements specified below.

2.6.1 Salt Spray Test

A sample of the sheets shall withstand a cyclic corrosion test for a minimum of 2016 hours in accordance with ASTM D 5894, including the scribe requirement in the test. Immediately upon removal of the panel from the test, the coating shall receive a rating of not less than 10, no blistering, as determined by ASTM D 714; 10, no rusting, as determined by ASTM D 610; and a rating of 6, over 21/16 to 1/8 inch failure at scribe, as determined by ASTM D 1654.

2.6.2 Formability Test

When subjected to testing in accordance with ASTM D 522 Method B, 1/8 inch diameter mandrel, the coating film shall show no evidence of cracking to the naked eye.

2.6.3 Accelerated Weathering, Chalking Resistance and Color Change

A sample of the sheets shall be tested in accordance with ASTM G 154, test condition UVA-340 lamp, 8h UV at 60 degrees C followed by 4h CON at 112 degrees F for 4000 total hours. The coating shall withstand the weathering test without cracking, peeling, blistering, loss of adhesion of the protective coating, or corrosion of the base metal. Protective coating with an adhesion rating less than 4B when tested in accordance with ASTM D 3359, Test Method B, shall be considered as an area indicating loss of adhesion. Following the accelerated weathering test, the coating shall have a chalk rating not less than No. 8 in accordance with ASTM D 4214 test procedures, and the color change shall not exceed 5 CIE or Hunter Lab color difference (delta E) units in accordance with ASTM D 2244.

2.6.4 Humidity Test

When subjected to a humidity cabinet test in accordance with ASTM D 2247 for 1000 hours, a scored panel shall show no signs of blistering, cracking, creepage or corrosion.

2.6.5 Impact Resistance

Factory-painted sheet shall withstand direct and reverse impact in accordance with ASTM D 2794 0.500 inch diameter hemispherical head indenter, equal to 1.5 times the metal thickness in mils, expressed in inch-pounds, with no cracking.

2.6.6 Abrasion Resistance Test

When subjected to the falling sand test in accordance with ASTM D 968, Method A, the coating system shall withstand a minimum of 50 liters of sand before the appearance of the base metal. The term "appearance of base metal" refers to the metallic coating on steel or the aluminum base metal.

2.6.7 Specular Gloss

Finished roof surfaces shall have a specular gloss value of "medium".

2.6.8 Pollution Resistance

Coating shall show no visual effects when covered spot tested in a 10 percent hydrochloric acid solution for 24 hours in accordance with ASTM D 1308.

2.7 INSULATION

Thermal resistance of insulation shall be not less than the R-values shown on the contract drawings. R-values shall be determined at a mean temperature of 75 degrees F in accordance with ASTM C 518. Insulation shall be a standard product with the insulation manufacturer, factory marked or identified with insulation manufacturer's name or trademark and R-value. Identification shall be on individual pieces or individual packages. Insulation shall have a flame spread not in excess of 75 and a smoke developed rating not in excess of 450 when tested in accordance with ASTM E 84. The stated R-value of the insulation shall be certified by an independent Registered Professional Engineer if tests are conducted in the insulation manufacturer's laboratory. Contractor shall comply with EPA requirements in accordance with Section 01670 RECYCLED / RECOVERED MATERIALS.

2.7.1 Polyisocyanurate Rigid Board Insulation for Use Above a Roof Deck

Polyisocyanurate insulation shall conform to ASTM C 1289, Type II, (having a minimum recovered material content of 9 percent by weight of core material in the polyisocyanurate portion). For impermeable faced polyisocyanurate (Ex: aluminum foil), the maximum design R-value per 1 inch of insulation used shall be 7.2 times degree K divided by watts (5.56 hours times square feet times degree F divided by BTU). Facings shall be non-asphaltic, glass fiber reinforced. Both faced and unfaced types shall be used per the drawings.

2.8 INSULATION RETAINERS

Insulation retainers shall be type, size, and design necessary to adequately hold the insulation and to provide a neat appearance. Metallic retaining members shall be nonferrous or have a nonferrous coating. Nonmetallic retaining members, including adhesives used in conjunction with mechanical retainers or at insulation seams, shall have a fire resistance classification not less than that permitted for the insulation.

2.9 SEALANT

Sealants shall be elastomeric type containing no oil or asphalt. Exposed sealant shall be colored to match the applicable building color and shall cure to a rubberlike consistency. Sealant placed in the roof panel standing seam ribs shall be provided in accordance with the manufacturer's recommendations.

2.10 GASKETS AND INSULATING COMPOUNDS

Gaskets and insulating compounds shall be nonabsorptive and suitable for insulating contact points of incompatible materials. Insulating compounds shall be nonrunning after drying.

2.11 SLIP SHEET

Slip sheet shall be a 5 lb. per 100 square feet rosin-sized, unsaturated building paper.

2.12 EPDM RUBBER BOOTS

Flashing devices around pipe penetrations shall be flexible, one-piece devices molded from weather-resistant EPDM rubber. Rubber boot material shall be as recommended by the manufacturer. The boots shall have base rings made of aluminum or corrosion resisting steel that conform to the contours of the roof panel to form a weather-tight seal.

2.13 ICE AND WATER BARRIER UNDERLAYMENT

Self-adhering ice and water barrier underlayment shall comply with ASTM D 1970 for roofing protection. Provide a high temperature resistant, rubberized underlayment such as Tamko "TW Metal and Tile Underlayment", GAF "Stormguard HT", or equal. See drawings for required locations at valleys and entire roof surface.

2.14 THERMAL BREAK

Adhesive-breaked polystyrene.

2.15 VAPOR RETARDER

2.15.1 Vapor Retarders Separate from Insulation

Vapor retarder material shall be polyethylene sheeting conforming to ASTM D 4397. A single ply of 10 mil polyethylene sheet; or, at the Contractor's option, a double ply of 6 mil polyethylene sheet shall be used. A fully compatible polyethylene tape which has equal or better water vapor control characteristics than the vapor retarder material shall be provided. A cloth industrial duct tape in a utility grade shall also be provided to use as needed to protect the vapor retarder from puncturing.

PART 3 EXECUTION

3.1 INSTALLATION

Installation shall be in accordance with the manufacturer's erection instructions and drawings. Dissimilar materials which are not compatible when contacting each other shall be insulated by means of gaskets or insulating compounds. Molded closure strips shall be installed wherever roofing sheets terminate in open-end configurations, exclusive of flashings. The closure strip installation shall be weather-tight and sealed. Screws shall be installed with a clutching screw gun, to assure screws are not stripped. Field test shall be conducted on each gun prior to starting installation and periodically thereafter to assure it is adjusted properly to install particular type and size of screw as recommended by manufacturer's literature. Improper or mislocated drill holes shall be plugged with an oversize screw fastener and gasketed washer; however, sheets with an excess of such holes or with such holes in critical locations shall not be used. Exposed surfaces and edges shall be kept clean and free from sealant, metal cuttings, hazardous burrs, and other foreign material. Stained, discolored, or damaged sheets shall be removed from the site.

3.1.1 Field Forming of Panels

Field forming of panels will not be permitted.

3.1.2 Subpurlins

Unless otherwise shown, subpurlins shall be anchored to the purlins or other structural framing members with bolts or screws. Attachment to the substrate (when provided) or to the panels is not permitted. The subpurlin spacing shall not exceed 30 inches on centers at the corner, edge and ridge zones, and 5 foot maximum on centers for the remainder of the roof. Corner, edge, and ridge zones are as defined in ASCE 7.

3.1.3 Roof Panel Installation

Roof panels shall be installed with the standing seams in the direction of the roof slope. The side seam connections for installed panels shall be completed at the end of each day's work. Method of applying joint sealant shall conform to the manufacturer's recommendation to achieve a complete weather-tight installation. End laps of panels shall be provided in accordance with the manufacturer's instructions. Closures, flashings, EPDM rubber boots, roof curbs, and related accessories shall be installed according to the manufacturer's drawings. Fasteners shall not puncture roofing sheets except as provided for in the manufacturer's instructions

for erection and installation. Expansion joints for the standing seam roof system shall be installed at locations indicated on the contract drawings and other locations indicated on the manufacturer's drawings. After installation, and before any panels are installed, purlins shall be checked with a stringline to insure they are in the same plane. Tolerances shall be in accordance with the panel manufacturer's recommendations. Purlins shall be shimmed, or building framing adjusted, as necessary to bring them into tolerance. The roofing manufacturer shall send their factory technical representative a minimum of five (5) times to the site to inspect the roofing installation for conformance with manufacturer's installation requirements. The timing of these trips shall be coordinated with the Contracting Officer's Representative (COR). A written report shall be given to the COR on each trip.

3.1.4 Concealed Anchor Clips

Concealed anchor clips shall be fastened directly to the structural framing members. Attachment to the substrate (when provided) or to the metal deck is not permitted. The maximum distance, parallel to the seams, between clips shall be 30 inches on center at the corner, edge, and ridge zones, and 5 feet maximum on centers for the remainder of the roof.

3.2 INSULATION INSTALLATION

Insulation shall be continuous over entire roof surface. Where expansion joints, terminations, and other connections are made, the cavity shall be filled with batt insulation with vapor retarder providing equivalent R-value and perm rating as remaining insulation. Insulation shall be installed as indicated and in accordance with manufacturer's instructions.

3.2.1 Board Insulation

Rigid or semirigid board insulation shall be laid in close contact. Board shall be attached to the metal roof deck with bearing plates and fasteners, as recommended by the insulation manufacturer, so that the insulation joints are held tight against each other, and shall have a minimum of 1 fastener per 4 square feet. Layout and joint pattern of insulation and fasteners shall be indicated on the shop drawings. If more than one layer of insulation is required, joints in the second layer shall be offset from joints in the first layer.

3.3 SLIP SHEET INSTALLATION

A slip sheet shall be laid over the blanket insulation facing to prevent the vinyl facing from adhering to the metal roofing.

3.4 CLEANING AND TOUCH-UP

Exposed SSSMR systems shall be cleaned at completion of installation. Debris that could cause discoloration and harm to the panels, flashings, closures and other accessories shall be removed. Grease and oil films, excess sealants, and handling marks shall be removed and the work shall be scrubbed clean. Exposed metal surfaces shall be free of dents, creases, waves, warps, buckles, fastening stresses, and distortions. Immediately upon detection, abraded or corroded spots on shop-painted surfaces shall be wire brushed and touched up with the same material used for the shop coat. Factory color finished surfaces shall be touched up with the manufacturer's recommended touch up paint.

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM

FACILITY DESCRIPTION_____

BUILDING NUMBER:_____

CORPS OF ENGINEERS CONTRACT NUMBER:_____

CONTRACTOR

CONTRACTOR:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

OWNER

OWNER:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

CONSTRUCTION AGENT

CONSTRUCTION AGENT:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM
(continued)

THE SSSMR SYSTEM INSTALLED ON THE ABOVE NAMED BUILDING IS WARRANTED BY _____ FOR A PERIOD OF FIVE (5) YEARS AGAINST WORKMANSHIP AND MATERIAL DEFICIENCES, WIND DAMAGE, STRUCTURAL FAILURE, AND LEAKAGE. THE SSSMR SYSTEM COVERED UNDER THIS WARRANTY SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING: THE ENTIRE ROOFING SYSTEM, MANUFACTURER SUPPLIED FRAMING AND STRUCTURAL MEMBERS, METAL ROOF PANELS, FASTENERS, PURLINS, CONNECTORS, ROOF SECUREMENT COMPONENTS, AND ASSEMBLIES TESTED AND APPROVED IN ACCORDANCE WITH ASTM E 1592. IN ADDITION, THE SYSTEM PANEL FINISHES, ICE AND WATER SHIELD, SLIP SHEET, RIGID AND BATT INSULATION, VAPOR RETARDER, ALL ACCESSORIES, COMPONENTS, AND TRIM AND ALL CONNECTIONS ARE INCLUDED. THIS INCLUDES ROOF PENETRATION ITEMS SUCH AS VENTS AND CURBS; EXTERIOR GUTTERS AND DOWNSPOUTS; EAVES, RIDGE, HIP, VALLEY, RAKE, GABLE, WALL, OR OTHER ROOF SYSTEM FLASHINGS INSTALLED AND ANY OTHER COMPONENTS SPECIFIED WITHIN THIS CONTRACT TO PROVIDE A COMPLETE AND WEATHERTIGHT ROOF SYSTEM; AND ITEMS SPECIFIED IN OTHER SECTIONS OF THE SPECIFICATIONS THAT ARE PART OF THE SSSMR SYSTEM.

ALL MATERIAL DEFICIENCIES, WIND DAMAGE, STRUCTURAL FAILURE, AND LEAKAGE ASSOCIATED WITH THE SSSMR SYSTEM COVERED UNDER THIS WARRANTY SHALL BE REPAIRED AS APPROVED BY THE CONTRACTING OFFICER. THIS WARRANTY SHALL COVER THE ENTIRE COST OF REPAIR OR REPLACEMENT, INCLUDING ALL MATERIAL, LABOR, AND RELATED MARKUPS. THE ABOVE REFERENCED WARRANTY COMMENCED ON THE DATE OF FINAL ACCEPTANCE ON _____ AND WILL REMAIN IN EFFECT FOR STATED DURATION FROM THIS DATE.

SIGNED, DATED, AND NOTARIZED (BY COMPANY PRESIDENT)

_____

(Company President) (Date)

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM
(continued)

THE CONTRACTOR SHALL SUPPLEMENT THIS WARRANTY WITH WRITTEN WARRANTIES FROM THE MANUFACTURER AND/OR INSTALLER OF THE SSSMR SYSTEM, WHICH SHALL BE SUBMITTED ALONG WITH THE CONTRACTOR'S WARRANTY. HOWEVER, THE CONTRACTOR WILL BE ULTIMATELY RESPONSIBLE FOR THIS WARRANTY AS OUTLINED IN THE SPECIFICATIONS AND AS INDICATED IN THIS WARRANTY EXAMPLE.

EXCLUSIONS FROM COVERAGE

1. NATURAL DISASTERS, ACTS OF GOD (LIGHTNING, FIRE, EXPLOSIONS, SUSTAINED WIND FORCES IN EXCESS OF THE DESIGN CRITERIA, EARTHQUAKES, AND HAIL).

2. ACTS OF NEGLIGENCE OR ABUSE OR MISUSE BY GOVERNMENT OR OTHER PERSONNEL, INCLUDING ACCIDENTS, VANDALISM, CIVIL DISOBEDIENCE, WAR, OR DAMAGE CAUSED BY FALLING OBJECTS.

3. DAMAGE BY STRUCTURAL FAILURE, SETTLEMENT, MOVEMENT, DISTORTION, WARPAGE, OR DISPLACEMENT OF THE BUILDING STRUCTURE OR ALTERATIONS MADE TO THE BUILDING.

4. CORROSION CAUSED BY EXPOSURE TO CORROSIVE CHEMICALS, ASH OR FUMES GENERATED OR RELEASED INSIDE OR OUTSIDE THE BUILDING FROM CHEMICAL PLANTS, FOUNDRIES, PLATING WORKS, KILNS, FERTILIZER FACTORIES, PAPER PLANTS, AND THE LIKE.

5. FAILURE OF ANY PART OF THE SSSMR SYSTEM DUE TO ACTIONS BY THE OWNER TO INHIBIT FREE DRAINAGE OF WATER FROM THE ROOF AND GUTTERS AND DOWNSPOUTS OR ALLOW PONDING WATER TO COLLECT ON THE ROOF SURFACE. CONTRACTOR'S DESIGN SHALL INSURE FREE DRAINAGE FROM THE ROOF AND NOT ALLOW PONDING WATER.

6. THIS WARRANTY APPLIES TO THE SSSMR SYSTEM. IT DOES NOT INCLUDE ANY CONSEQUENTIAL DAMAGE TO THE BUILDING INTERIOR OR CONTENTS WHICH IS COVERED BY THE WARRANTY OF CONSTRUCTION CLAUSE INCLUDED IN THIS CONTRACT.

7. THIS WARRANTY CANNOT BE TRANSFERRED TO ANOTHER OWNER WITHOUT WRITTEN CONSENT OF THE CONTRACTOR; AND THIS WARRANTY AND THE CONTRACT PROVISIONS WILL TAKE PRECEDENCE OVER ANY CONFLICTS WITH STATE STATUTES.

**

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM
(continued)

**REPORTS OF LEAKS AND SSSMR SYSTEM DEFICIENCIES SHALL BE RESPONDED TO WITHIN 48 HOURS OF RECEIPT OF NOTICE, BY TELEPHONE OR IN WRITING, FROM EITHER THE OWNER OR CONTRACTING OFFICER. EMERGENCY REPAIRS TO PREVENT FURTHER ROOF LEAKS SHALL BE INITIATED IMMEDIATELY; A WRITTEN PLAN SHALL BE SUBMITTED FOR APPROVAL TO REPAIR OR REPLACE THIS SSSMR SYSTEM WITHIN SEVEN (7) CALENDAR DAYS. ACTUAL WORK FOR PERMANENT REPAIRS OR REPLACEMENT SHALL BE STARTED WITHIN 30 DAYS AFTER RECEIPT OF NOTICE, AND COMPLETED WITHIN A REASONABLE TIME FRAME. IF THE CONTRACTOR FAILS TO ADEQUATELY RESPOND TO THE WARRANTY PROVISIONS, AS STATED IN THE CONTRACT AND AS CONTAINED HEREIN, THE CONTRACTING OFFICER MAY HAVE THE SSSMR SYSTEM REPAIRED OR REPLACED BY OTHERS AND CHARGE THE COST TO THE CONTRACTOR.

IN THE EVENT THE CONTRACTOR DISPUTES THE EXISTENCE OF A WARRANTABLE DEFECT, THE CONTRACTOR MAY CHALLENGE THE OWNER'S DEMAND FOR REPAIRS AND/OR REPLACEMENT DIRECTED BY THE OWNER OR CONTRACTING OFFICER EITHER BY REQUESTING A CONTRACTING OFFICER'S DECISION UNDER THE CONTRACT DISPUTES ACT, OR BY REQUESTING THAT AN ARBITRATOR RESOLVE THE ISSUE. THE REQUEST FOR AN ARBITRATOR MUST BE MADE WITHIN 48 HOURS OF BEING NOTIFIED OF THE DISPUTED DEFECTS. UPON BEING INVOKED, THE PARTIES SHALL, WITHIN TEN (10) DAYS, JOINTLY REQUEST A LIST OF FIVE (5) ARBITRATORS FROM THE FEDERAL MEDIATION AND CONCILIATION SERVICE. THE PARTIES SHALL CONFER WITHIN TEN (10) DAYS AFTER RECEIPT OF THE LIST TO SEEK AGREEMENT ON AN ARBITRATOR. IF THE PARTIES CANNOT AGREE ON AN ARBITRATOR, THE CONTRACTING OFFICER AND THE PRESIDENT OF THE CONTRACTOR'S COMPANY WILL STRIKE ONE (1) NAME FROM THE LIST ALTERNATIVELY UNTIL ONE (1) NAME REMAINS. THE REMAINING PERSON SHALL BE THE DULY SELECTED ARBITRATOR. THE COSTS OF THE ARBITRATION, INCLUDING THE ARBITRATOR'S FEE AND EXPENSES, COURT REPORTER, COURTROOM OR SITE SELECTED, ETC., SHALL BE BORNE EQUALLY BETWEEN THE PARTIES. EITHER PARTY DESIRING A COPY OF THE TRANSCRIPT SHALL PAY FOR THE TRANSCRIPT. A HEARING WILL BE HELD AS SOON AS THE PARTIES CAN MUTUALLY AGREE. A WRITTEN ARBITRATOR'S DECISION WILL BE REQUESTED NOT LATER THAN 30 DAYS FOLLOWING THE HEARING. THE DECISION OF THE ARBITRATOR WILL NOT BE BINDING; HOWEVER, IT WILL BE ADMISSIBLE IN ANY SUBSEQUENT APPEAL UNDER THE CONTRACT DISPUTES ACT.

A FRAMED COPY OF THIS WARRANTY SHALL BE POSTED IN THE MECHANICAL ROOM OR OTHER APPROVED LOCATION DURING THE ENTIRE WARRANTY PERIOD.

-- End of Section --

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DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION 07600

FLASHING AND SHEET METAL

02/03

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SECTION 07600

FLASHING AND SHEET METAL
02/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 209	(2001) Aluminum and Aluminum Alloy Sheet and Plate
ASTM B 221	(2000) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM D 41	(1994) Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
ASTM D 226	(1997, Rev A) Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
ASTM D 4586	(2000) Asphalt Roof Cement, Asbestos-Free

AMERICAN WELDING SOCIETY (AWS)

AWS D1.2	(1997) Structural Welding Code Aluminum

SHEET METAL & AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

SMACNA Arch. Manual	(1993) Architectural Sheet Metal Manual

1.2 General Requirements

Sheet metalwork shall be accomplished to form weathertight construction without waves, warps, buckles, fastening stresses or distortion, and shall allow for expansion and contraction. Cutting, fitting, drilling, and other operations in connection with sheet metal required to accommodate the work of other trades shall be performed by sheet metal mechanics. Installation of sheet metal items used in conjunction with roofing shall be coordinated with roofing work to permit continuous roofing operations. Sheet metalwork pertaining to heating, ventilating, and air conditioning is specified in Division 15.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the

Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Base flashing; G, AE.

Counterflashing; G, AE.

Flashing at roof penetrations; G, AE.

Open valley flashing; G, AE.

Eave and rake flashing; G, AE.

Indicate thicknesses, dimensions, fastenings and anchoring methods, expansion joints, and other provisions necessary for thermal expansion and contraction. Scaled manufacturer's catalog data may be submitted for factory fabricated items.

SD-11 Closeout Submittals

Quality Control Plan; G, AO.

Submit for sheet metal work in accordance with paragraph entitled "Field Quality Control."

1.4 DELIVERY, HANDLING, AND STORAGE

Package and protect materials during shipment. Uncrate and inspect materials for damage, dampness, and wet-storage stains upon delivery to the job site. Remove from the site and replace damaged materials that cannot be restored to like-new condition. Handle sheet metal items to avoid damage to surfaces, edges, and ends. Store materials in dry, weather-tight, ventilated areas until immediately before installation.

PART 2 PRODUCTS

2.1 MATERIALS

Materials shall conform to the requirements specified below and to the thicknesses and configurations established in SMACNA Arch. Manual.

Furnish sheet metal items in 8 to 10 foot lengths. Single pieces less than 8 feet long may be used to connect to factory-fabricated inside and outside corners, and at ends of runs. Factory fabricate corner pieces with minimum 12 inch legs. Provide accessories and other items essential to complete the sheet metal installation. These accessories shall be made of the same materials as the items to which they are applied. Fabricate sheet metal items of the materials specified below and to the gage, thickness, or weight shown in Table I at the end of this section. Sheet metal items shall have anodized finish unless specified otherwise.

2.1.1 Exposed Sheet Metal Items

Shall be of the same material. The following items shall be considered as exposed sheet metal: gutters, including hangers; downspouts; fascias; cap, valley, steeped, base, and eave flashings and related accessories.

2.1.2 Aluminum Alloy Sheet and Plate

ASTM B 209, anodized color matching "Berridge Champagne" roof, form alloy, and temper appropriate for use.

2.1.2.1 Alclad

When fabricated of aluminum, the following items shall be fabricated of Alclad 3003, Alclad 3004, Alclad 3005, clad on one side unless otherwise indicated.

a. Gutters, downspouts, and hangers

b. Flashing

2.1.3 Aluminum Alloy, Extruded Bars, Rods, Shapes, and Tubes

ASTM B 221.

2.1.4 Bituminous Plastic Cement

ASTM D 4586, Type I.

2.1.5 Building Paper

ASTM D 226 Type I.

2.1.6 Asphalt Primer

ASTM D 41.

2.1.7 Through-Wall Flashing

Through-wall flashing for masonry is specified in Section 04810, " Nonbearing Masonry Veneer/Steel Stud Walls".

2.1.8 Fasteners

Use the same metal or a metal compatible with the item fastened. Use stainless steel fasteners to fasten dissimilar materials.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Workmanship

Make lines, arrises, and angles sharp and true. Free exposed surfaces from visible wave, warp, and buckle, and tool marks. Fold back exposed edges neatly to form a 1/2 inch hem on the concealed side. Make sheet metal exposed to the weather watertight with provisions for expansion and contraction.

Make surfaces to receive sheet metal plumb and true, clean, even, smooth, dry, and free of defects and projections which might affect the application. For installation of items not shown in detail or not covered by specifications conform to the applicable requirements of SMACNA Arch. Manual, Architectural Sheet Metal Manual. Provide sheet metal flashing in the angles formed where roof decks abut walls, curbs, ventilators, pipes,

or other vertical surfaces and wherever indicated and necessary to make the work watertight. Join sheet metal items together as shown in Table II.

3.1.2 Nailing

Confine nailing of sheet metal generally to sheet metal having a maximum width of 18 inches. Confine nailing of flashing to one edge only. Space nails evenly not over 3 inches on centers and approximately 1/2 inch from edge unless otherwise specified or indicated. Face nailing will not be permitted. Include in shop drawings the locations for sleepers and nailing strips required to secure the work. Sleepers and nailing strips are specified in Section 06100, "Rough Carpentry."

3.1.3 Cleats

Provide cleats for sheet metal 18 inches and over in width. Space cleats evenly not over 12 inches on centers unless otherwise specified or indicated. Unless otherwise specified, cleats shall be not less than 2 inches wide by 3 inches long and of the same material and thickness as the sheet metal being installed. Secure one end of the cleat with two nails and the cleat folded back over the nailheads. Lock the other end into the seam. Where the fastening is to be made to masonry, screws shall be used and shall be driven in expansion shields set in masonry. Pretin cleats for soldered seams.

3.1.4 Bolts, Rivets, and Screws

Install bolts, rivets, and screws where indicated or required. Provide compatible washers where required to protect surface of sheet metal and to provide a watertight connection. Joints in aluminum sheets 0.040 inch or less in thickness shall be mechanically made.

3.1.5 Seams

Straight and uniform in width and height with no solder showing on the face.

3.1.5.1 Flat-lock Seams

Finish not less than 3/4 inch wide.

3.1.5.2 Lap Seams

Finish soldered seams not less than one inch wide. Overlap seams not soldered, not less than 3 inches.

3.1.5.3 Loose-Lock Expansion Seams

Not less than 3 inches wide; provide minimum one inch movement within the joint. Completely fill the joints with the specified sealant, applied at not less than 1/8 inch thick bed. Sealants are specified in Section 07920, "Joint Sealants."

3.1.5.4 Flat Seams

Make seams in the direction of the flow.

3.1.6 Welding and Mechanical Fastening

Use welding for aluminum of thickness greater than 0.040 inch. Aluminum

0.040 inch or less in thickness shall be butted and the space backed with formed flashing plate; or lock joined, mechanically fastened, and filled with sealant as recommended by the aluminum manufacturer.

3.1.6.1 Welding of Aluminum

Use welding of the inert gas, shield-arc type. For procedures, appearance and quality of welds, and the methods used in correcting welding work, conform to AWS D1.2.

3.1.6.2 Mechanical Fastening of Aluminum

Use No. 12, aluminum alloy, sheet metal screws or other suitable aluminum alloy or stainless steel fasteners. Drive fasteners in holes made with a No. 26 drill in securing side laps, end laps, and flashings. Space fasteners 12 inches maximum on centers. Where end lap fasteners are required to improve closure, locate the end lap fasteners not more than 2 inches from the end of the overlapping sheet.

3.1.7 Protection from Contact with Dissimilar Materials

3.1.7.1 Aluminum

Aluminum surfaces shall not directly contact other metals except stainless steel, zinc, or zinc coating. Where aluminum contacts another metal, paint the dissimilar metal with a primer followed by two coats of aluminum paint. Where drainage from a dissimilar metal passes over aluminum, paint the dissimilar metal with a non-lead pigmented paint.

3.1.7.2 Metal Surfaces

Paint surfaces in contact with mortar, concrete, or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint.

3.1.7.3 Wood or Other Absorptive Materials

Paint surfaces that may become repeatedly wet and in contact with metal with two coats of aluminum paint or a coat of heavy-bodied bituminous paint.

3.1.8 Expansion and Contraction

Provide expansion and contraction joints at not more than 32 foot intervals for aluminum and at not more than 40 foot intervals for other metals. Where the distance between the last expansion joint and the end of the continuous run is more than half the required interval, an additional joint shall be provided. Space joints evenly. Join extruded aluminum gravel stops and fascias by expansion and contraction joints spaced not more than 12 feet apart.

3.1.9 Base Flashing

Lay the base flashings shingle fashion, where practicable, where sloped roofs abut vertical surfaces. Extend up vertical surfaces of the flashing not less than 8 inches and not less than 4 inches under the roof covering. Where finish wall coverings form a counterflashing, extend the vertical leg of the flashing up behind the applied wall covering not less than 6 inches. Overlap the flashing strips with the previously laid flashing not less than 3 inches. Fasten the strips at their upper edge to the deck. Horizontal flashing at vertical surfaces must extend vertically above the roof surface

and fastened at their upper edge to the deck a minimum of 6 inches o.c. with hex headed, galvanized shielded screws a minimum of 2-inch lap of any surface. Finish end laps and provide for expansion and contraction. Extend the metal flashing over crickets at the up-slope side of vertical surfaces extending through sloping roofs. Extend the metal flashings onto the roof covering not less than 4.5 inches at the lower side of vertical surfaces extending through the roof decks. Install and fit the flashings so as to be completely weathertight. Base flashing for interior and exterior corners shall be factory-fabricated.

3.1.10 Counterflashing

Except where indicated or specified otherwise, insert counterflashing in reglets located from 9 to 10 inches above roof decks, extend down vertical surfaces over upturned vertical leg of base flashings not less than 3 inches. Fold the exposed edges of counterflashings 1/2 inch. Where stepped counterflashings are required, they may be installed in short lengths a minimum 8 inch by 10 inch or may be of the preformed one-piece type. Provide end laps in counterflashings not less than 3 inches and make it weathertight with plastic cement. Do not make lengths of metal counterflashings exceed 10 feet. Form the flashings to the required shapes before installation. Factory-form the corners not less than 12 inches from the angle. Secure the flashings in the reglets with lead wedges and space not more than 18 inches apart. Fill reglets or raked joints which receive counterflashing with sealant. Sealant is covered in Section 07920, "Joint Sealants." Turn up the concealed edge of counterflashings not less than 1/4 inch and extend not less than 2 inches into the walls. Install counterflashing to provide a spring action against base flashing.

3.1.11 Metal Reglets

Sealant type or friction type reglets shall be factory fabricated with a minimum opening of 1/4 inch and a depth of 1 1/4 inches, as approved.

3.1.12 Gutters

The hung type of shape indicated and supported on underside by brackets that permit free thermal movement of the gutter. Provide gutters in sizes indicated complete with mitered corners, end caps, outlets, brackets, and other accessories necessary for installation. Bead with hemmed edge or reinforce the outer edge of gutter with a stiffening bar not less than 3/4 by 3/16 inch of material compatible with gutter. Fabricate gutters in sections not less than 8 feet. Lap the sections a minimum of one inch in the direction of flow or provide with concealed splice plate 6 inches minimum. Join the gutters, other than aluminum, by riveted and soldered joints. Aluminum gutters shall be joined with riveted sealed joints. Provide expansion-type slip joints midway between outlets. Install gutters below slope line of the roof so that snow and ice can slide clear. Support gutters by continuous cleats or by cleats spaced not less than 36 inches apart. Adjust gutters to slope uniformly to outlets, with high points occurring midway between outlets. Fabricate hangers and fastenings from metals compatible with the gutters.

3.1.13 Downspouts

Supports for downspouts shall be spaced according to the manufacturer's recommendation for the masonry substrate. Types, shapes and sizes are indicated. Provide complete including elbows and offsets. Provide downspouts in approximately 10 foot lengths. Provide end joints to

telescope not less than 1/2 inch and lock longitudinal joints. Provide gutter outlets with wire ball strainers for each outlet. Provide strainers to fit tightly into outlets and be of the same material used for gutters. Keep downspouts not less than one inch away from walls. Fasten to the walls at top, bottom, and at an intermediate point not to exceed 5 feet on centers with leader straps or concealed rack-and-pin type fasteners. Form straps and fasteners of metal compatible with the downspouts.

3.1.13.1 Terminations

Neatly fit into the drainage connection the downspouts terminating in drainage lines and fill the joints with a portland cement mortar cap sloped away from the downspout. Provide downspouts terminating in splash blocks with elbow-type fittings. Concrete splash block is specified in Section 03300, "Cast-In-Place Structural Concrete."

3.1.14 Open Valley Flashing

Provide valley flashing free of longitudinal seams, of width sufficient to extend not less than 18 inches under the roof covering on each side. Provide a 1/2 inch fold on each side of the valley flashing. Lap the sheets not less than 6 inches in the direction of flow and secure to roofing construction with cleats attached to the fold on each side. Nail the tops of sheets to roof sheathing. Space the cleats not more than 12 inches on centers. Provide exposed flashing not less than 4 inches in width at the top and increase one inch in width for each additional 8 feet in length. Where the slope of the valley is 4.5 inches or less per foot, or the intersecting roofs are on different slopes, provide an inverted V-joint, one inch high, along the centerline of the valley; and extend the edge of the valley sheets 8 inches under the roof covering on each side.

3.1.15 Eave Flashing

One piece in width, applied in 8 to 10 foot lengths with expansion joints spaced as specified in paragraph entitled "Expansion and Contraction." Provide a 3/4 inch continuous fold in the upper edge of the sheet to engage cleats spaced not more than 10 inches on centers. Locate the upper edge of flashing not less than 18 inches from the outside face of the building, measured along the roof slope. Fold lower edge of the flashing over and loose-lock into a continuous edge strip on the fascia. Where eave flashing intersects metal valley flashing, secure with one inch flat locked joints with cleats that are 10 inches on centers. Place eave flashing over underlayment and in plastic bituminous cement.

3.1.16 Sheet Metal Covering on Flat, Sloped, or Curved Surfaces

Except as specified or indicated otherwise, cover and flash all minor flat, sloped, or curved surfaces such as crickets, bulkheads, dormers and small decks with metal sheets of the material used for flashing; maximum size of sheets, 16 by 18 inches. Fasten sheets to sheathing with metal cleats. Lock seams and solder. Lock aluminum seams and fill with sealer as recommended by aluminum manufacturer. Provide an underlayment of building paper for all sheet metal covering.

3.1.17 Flashing at Roof Penetrations

Provide metal flashing for all pipes, and conduits projecting through the roof surface and for similar items supported by or attached to the roof deck.

3.1.18 Single Pipe Vents

See Table I, footnote (d). Set flange of sleeve in bituminous plastic cement and nail 3 inches on centers. Bend the top of sleeve over and extend down into the vent pipe a minimum of 2 inches. For long runs or long rises above the deck, where it is impractical to cover the vent pipe with lead, use a two-piece formed metal housing. Set metal housing with a metal sleeve having a 4 inch roof flange in bituminous plastic cement and nailed 3 inches on centers. Extend sleeve a minimum of 8 inches above the roof deck and lapped a minimum of 3 inches by a metal hood secured to the vent pipe by a draw band. Seal the area of hood in contact with vent pipe with an approved sealant. Sealants are covered under Section 07920, "Joint Sealants."

3.2 PAINTING

Field-paint sheet metal for separation of dissimilar materials.

3.2.1 Aluminum Surfaces

Shall be solvent cleaned and given one coat of zinc-molybdate primer and one coat of aluminum paint as specified in Section 09900, "Painting, General."

3.3 CLEANING

Clean exposed sheet metal work at completion of installation. Remove grease and oil films, handling marks, contamination from steel wool, fittings and drilling debris, and scrub-clean. Free the exposed metal surfaces of dents, creases, waves, scratch marks, and solder or weld marks.

3.4 REPAIRS TO FINISH

Scratches, abrasions, and minor surface defects of finish may be repaired in accordance with the manufacturer's printed instructions and as approved. Repair damaged surfaces caused by scratches, blemishes, and variations of color and surface texture. Replace items which cannot be repaired.

3.5 FIELD QUALITY CONTROL

3.5.1 Procedure

TABLE I. SHEET METAL WEIGHTS, THICKNESSES, AND GAGES

Sheet Metal Items	Aluminum, Inch	Stainless
Covering on minor flat, pitched or curved surfaces.....	.040	
Downspouts and leaders.....	.032	
Downspout clips and anchors.....	.040 clip .125 anchor	

TABLE I. SHEET METAL WEIGHTS, THICKNESSES, AND GAGES

Sheet Metal Items	Aluminum, Inch	Stainless
Downspout straps, 2-inch.....	.060	
Flashings:		
Base.....	.040	
Cap (Counter-flashing)	.032	
Eave.....	-	
Stepped.....	.032	
Valley.....	.032	
Pipe vent sleeve(d)		
Extrusions.....	.075	
Sheets, smooth.....	.050	
Edge strip.....	.050	
Gutters:		
Gutter section.....	6 .032	
Continuous cleat.....	.032	
Hangers, dimensions.....	1 inch x 1 .080 inch (c)	
Reglets (c).....	-	

(d) 2.5 pound minimum lead sleeve with 4 inch flange. Where lead sleeve is impractical, refer to paragraph entitled "Single Pipe Vents" for optional material.

TABLE II. SHEET METAL JOINTS

Item Designation	TYPE OF JOINT: Aluminum	Remarks
Flashings		
Base	One inch flat locked, soldered; sealed; 3 inch lap for expansion joint	Aluminum producer's recommended hard setting sealant for locked aluminum joints. Fill each metal

TABLE II. SHEET METAL JOINTS
TYPE OF JOINT

Item Designation	Aluminum	Remarks
		expansion joint with a joint sealing compound compound. See Section 07920, "Joint Sealants."
Cap-in reglet	3 inch lap	Seal groove with joint sealing compound. See Section 07920, "Joint Sealants."
Reglets	- - -	Seal reglet groove with joint sealing compound. See Section 07920, "Joint Sealants."
Eave	One inch flat locked, locked, cleated one inch loose locked, sealed expansion joints, cleated	Same as base flashing.
Stepped	3 inch lap	- - -
Valley	6 inch lap cleated	- - -
Edge strip	Butt	- - -
Sheet, smooth	Butt with 1/4 inch space	Use sheet flashing backup plate.
Gutters	One inch flat locked, riveted, and sealed	Aluminum producers recommended hard setting sealant for locked aluminum joints.

(a) Elastomeric flashing shall have 3 inch lap with manufacturer's recommended sealant.

(b) Polyvinyl chloride reglet shall be sealed with manufacturer's recommended sealant.

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SECTION 07840

FIRESTOPPING
06/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E 84	(2001) Surface Burning Characteristics of Building Materials
ASTM E 119	(2000a) Fire Tests of Building Construction and Materials
ASTM E 814	(2002) Fire Tests of Through-Penetration Fire Stops
ASTM E 1399	(1997; R 2000) Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems
ASTM E 1966	(2001) Fire-Resistive Joint Systems

FM GLOBAL (FM)

FM P7825a	(2003) Approval Guide Fire Protection
FM Standard 4991	(2003) FM Contractor Approval Standard

UNDERWRITERS LABORATORIES (UL)

UL 723	(1996; Rev thru Sep 2001) Test for Surface Burning Characteristics of Building Materials
UL 1479	(1994; Rev thru Aug 2000) Fire Tests of Through-Penetration Firestops
UL 2079	(1998) Tests for Fire Resistance of Building Joint Systems
UL Fire Resist Dir	(2001) Fire Resistance Directory (2 Vol.)

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the

Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Firestopping Materials; G, AE.

Detail drawings including manufacturer's descriptive data, typical details conforming to UL Fire Resist Dir or other details certified by another nationally recognized testing laboratory, installation instructions or UL listing details for a firestopping assembly in lieu of fire-test data or report. For those firestop applications for which no UL tested system is available through a manufacturer, a manufacturer's engineering judgement, derived from similar UL system designs or other tests, shall be submitted for review and approval prior to installation. Submittal shall indicate the firestopping material to be provided for each type of application. When more than a total of 5 penetrations and/or construction joints are to receive firestopping, provide drawings that indicate location, "F" and "T" ratings, and type of application.

SD-07 Certificates

Firestopping Materials; G, AO.

Certificates attesting that firestopping material complies with the specified requirements. In lieu of certificates, drawings showing UL classified materials as part of a tested assembly may be provided. Drawings showing evidence of testing by an alternate nationally recognized independent laboratory may be substituted.

Installer Qualifications; G, AO.

Documentation of training and experience.

Inspection; G, AO.

Manufacturer's representative certification stating that firestopping work has been inspected and found to be applied according to the manufacturer's recommendations and the specified requirements.

1.3 GENERAL REQUIREMENTS

Firestopping shall consist of furnishing and installing tested and listed firestop systems, combination of materials, or devices to form an effective barrier against the spread of flame, smoke and gases, and maintain the integrity of fire resistance rated walls, partitions, and ceiling assemblies, including through-penetrations and construction joints and gaps. Through-penetrations include the annular space around pipes, tubes, conduit, wires, cables and vents. Construction joints include those used to accommodate expansion, contraction, wind, or seismic movement; firestopping material shall not interfere with the required movement of the joint. Gaps requiring firestopping include gaps between the curtain wall and the floor slab and between the top of the fire-rated walls and the roof or floor deck above.

1.4 DELIVERY AND STORAGE

Materials shall be delivered in the original unopened packages or containers showing name of the manufacturer and the brand name. Materials shall be stored off the ground and shall be protected from damage and exposure to elements. Damaged or deteriorated materials shall be removed from the site.

1.5 INSTALLER QUALIFICATIONS

The Contractor shall engage an experienced Installer who is:

a. FM Research approved in accordance with FM Standard 4991, or

b. Certified, licensed, or otherwise qualified by the firestopping manufacturer as having the necessary staff, training, and a minimum of 3 years experience in the installation of manufacturer's products per specified requirements. A manufacturer's willingness to sell its firestopping products to the Contractor or to an installer engaged by the Contractor does not in itself confer qualification on the buyer. The Installer shall have been trained by a direct representative of the manufacturer (not distributor or agent) in the proper selection and installation procedures.

1.6 COORDINATION

The specified work shall be coordinated with other trades. Firestopping materials, at penetrations of pipes and ducts, shall be applied prior to insulating, unless insulation meets requirements specified for firestopping. Firestopping materials at building joints and construction gaps shall be applied prior to completion of enclosing walls or assemblies. Cast-in-place firestop devices shall be located and installed in place before concrete placement. Pipe, conduit or cable bundles shall be installed through cast-in-place device after concrete placement but before area is concealed or made inaccessible.

PART 2 PRODUCTS

2.1 FIRESTOPPING MATERIALS

Firestopping materials shall consist of commercially manufactured, asbestos-free, containing no water soluble intumescent imgredients, noncombustible products FM P7825a approved for use with applicable construction and penetrating items, complying with the following minimum requirements:

2.1.1 Fire Hazard Classification

Material shall have a flame spread of 25 or less, and a smoke developed rating of 50 or less, when tested in accordance with ASTM E 84 or UL 723. Material shall be an approved firestopping material as listed in UL Fire Resist Dir or by a nationally recognized testing laboratory.

2.1.2 Toxicity

Material shall be nontoxic to humans at all stages of application or during fire conditions.

2.1.3 Fire Resistance Rating

Firestop systems shall be UL Fire Resist Dir listed or FM P7825a approved with "F" rating at least equal to fire-rating of fire wall or floor in which penetraded openings are to be protected, except that "F" rating may be 3 hours in through-penetrations of 4 hour fire rated wall or floor. Firestop systems shall also have "T" rating where required.

2.1.3.1 Through-Penetrations

Firestopping materials for through-penetrations, as described in paragraph GENERAL REQUIREMENTS, shall provide "F" and "T" fire resistance ratings in accordance with ASTM E 814 or UL 1479. Fire resistance ratings shall be as follows:

a. Penetrations of Fire Resistance Rated Walls and Partitions: F Rating = Rating of wall or partition being penetrated.

b. Penetrations of Fire Resistance Rated, Ceiling Assemblies: F Rating = Rating of ceiling being penetrated.

2.1.3.2 Construction Joints and Gaps

Fire resistance ratings of construction joints, as described in paragraph GENERAL REQUIREMENTS, shall be the same as the construction in which they occur. Construction joints and gaps shall be provided with firestopping materials and systems that have been tested per ASTM E 119, ASTM E 1966 or UL 2079 to meet the required fire resistance rating. Systems installed at construction joints shall meet the cycling requirements of ASTM E 1399 or UL 2079.

PART 3 EXECUTION

3.1 PREPARATION

Areas to receive firestopping shall be free of dirt, grease, oil, or loose materials which may affect the fitting or fire resistance of the firestopping system. For cast-in-place firestop devices, formwork or metal deck to receive device prior to concrete placement shall be sound and capable of supporting device. Surfaces shall be prepared as recommended by the manufacturer.

3.2 INSTALLATION

Firestopping material shall completely fill void spaces regardless of geometric configuration, subject to tolerance established by the manufacturer. Firestopping shall be installed in accordance with manufacturer's written instructions. Tested and listed firestop systems shall be provided in the following locations, except in floor slabs on grade:

a. Penetrations of duct, conduit, tubing, cable and pipe through floors and through fire-resistance rated walls, partitions, and ceiling assemblies.

b. Penetrations of vertical shafts such as pipe chases.

c. Gaps at perimeter of fire-resistance rated walls and partitions, such as between the top of the walls and the bottom of roof decks.

d. Construction joints in fire rated walls and partitions.

e. Other locations where required to maintain fire resistance rating of the construction.

3.2.1 Insulated Pipes and Ducts

Thermal insulation shall be cut and removed where pipes or ducts pass through firestopping, unless insulation meets requirements specified for firestopping. Thermal insulation shall be replaced with a material having equal thermal insulating and firestopping characteristics.

3.2.2 Fire Dampers

Fire dampers shall be installed and firestopped in accordance with Section 15895 AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEM.

3.2.3 Data and Communication Cabling

Cabling for data and communication applications shall be sealed with re-enterable firestopping products that do not cure over time. Firestopping shall be modular devices, containing built-in self-sealing intumescent inserts. Firestopping devices shall allow for cable moves, adds or changes without the need to remove or replace any firestop materials.

3.3 INSPECTION

For all projects,the firestopped areas shall not be covered or enclosed until inspection is complete and approved by the manufacturer's technical representative. The manufacturer's representative shall inspect the applications initially to ensure adequate preparations (clean surfaces suitable for application, etc.) and periodically during the work to assure that the completed work has been accomplished according to the manufacturer's written instructions and the specified requirements. The Contractor shall submit written reports indicating locations of and types of penetrations and types of firestopping used at each location; type shall be recorded by UL listed printed numbers.

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SECTION 07920

JOINT SEALANTS
10/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C 509	(2000) Elastomeric Cellular Preformed Gasket and Sealing Material
ASTM C 734	(2001) Low-Temperature Flexibility of Latex Sealants After Artificial Weathering
ASTM C 919	(2002) Use of Sealants in Acoustical Applications
ASTM C 920	(2000) Elastomeric Joint Sealants
ASTM D 217	(1997) Cone Penetration of Lubricating Grease
ASTM D 1056	(2000) Flexible Cellular Materials - Sponge or Expanded Rubber
ASTM E 84	(2001) Surface Burning Characteristics of Building Materials

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Sealants; G, AE.

Primers; G, AE.

Bond breakers.

Backstops.

Manufacturer's descriptive data including storage requirements, shelf life, curing time, instructions for mixing and application, and primer data (if required). A copy of the Material Safety Data

Sheet shall be provided for each solvent, primer or sealant material. Highlight VOC Emissions.

SD-04 Samples

Samples; G, AE.

Samples of each type and color of sealant from manufacturer's standard offering.

SD-07 Certificates

Sealant.

Certificates of compliance stating that the materials conform to the specified requirements.

1.3 ENVIRONMENTAL CONDITIONS

The ambient temperature shall be within the limits of 40 and 90 degrees F when sealant is applied.

1.4 DELIVERY AND STORAGE

Deliver materials to the job site in unopened manufacturers' external shipping containers, with brand names, date of manufacture, color, and material designation clearly marked thereon. Elastomeric sealant containers shall be labeled to identify type, class, grade, and use. Carefully handle and store materials to prevent inclusion of foreign materials or subjection to sustained temperatures exceeding 90 degrees F or less than 0 degrees F.

PART 2 PRODUCTS

2.1 SEALANTS

Provide sealant that has been tested and found suitable for the substrates to which it will be applied. VOC content must be less than the current VOC content limits of SCAQMD Rule #1168.

2.1.1 Interior Sealant

ASTM C 920, Type S or M, Grade NS, Class 12.5, Use NT.

2.1.2 Exterior Sealant

For joints in vertical surfaces, provide ASTM C 920, Type S or M, Grade NS, Class 25, Use NT. For joints in horizontal surfaces, provide ASTM C 920, Type S or M, Grade P, Class 25, Use T.

2.1.3 Floor Joint Sealant

ASTM C 920, Type S or M, Grade P, Class 25, Use T.

2.1.4 Joint Sealant Colors

Colors of joint sealants shall in general match the adjacent surfaces to which they are applied, but in no case shall the color be lighter in value than the adjacent surface. Colors shall be selected from the

manufacturer's standard offering.

2.1.5 Acoustical Sealant

Rubber or polymer-based acoustical sealant conforming to ASTM C 919 shall have a flame spread of 25 or less and a smoke developed rating of 50 or less when tested in accordance with ASTM E 84. Acoustical sealant shall have a consistency of 250 to 310 when tested in accordance with ASTM D 217, and shall remain flexible and adhesive after 500 hours of accelerated weathering as specified in ASTM C 734, and shall be non-staining.

2.1.6 Preformed Sealant

Preformed sealant shall be polybutylene or isoprene-butylene based pressure sensitive weather resistant tape or bead sealant capable of sealing out moisture, air and dust when installed as recommended by the manufacturer. At temperatures from minus 30 to plus 160 degrees F, the sealant shall be non-bleeding and shall have no loss of adhesion.

2.1.6.1 Tape

Tape sealant: cross-section dimensions shall be 150% of joint width; depth equal to 3 x joint width.

2.1.6.2 Bead

Bead sealant: cross-section dimensions shall be 150% of joint width; depth equal to 3 x joint width.

2.1.6.3 Foam Strip

Foam strip shall be polyurethane foam; cross-section dimensions shall be 150% of joint width; depth equal to 3 x joint width. Foam strip shall be capable of sealing out moisture, air, and dust when installed and compressed as recommended by the manufacturer. Service temperature shall be minus 40 to plus 275 degrees F. Untreated strips shall be furnished with adhesive to hold them in place. Adhesive shall not stain or bleed into adjacent finishes. Treated strips shall be saturated with butylene waterproofing or impregnated with asphalt.

2.2 PRIMERS

Provide a nonstaining, quick-drying type and consistency recommended by the sealant manufacturer for the particular application.

2.3 BOND BREAKERS

Provide the type and consistency recommended by the sealant manufacturer to prevent adhesion of the sealant to backing or to bottom of the joint.

2.4 BACKSTOPS

Provide glass fiber roving or neoprene, butyl, polyurethane, or polyethylene foams free from oil or other staining elements as recommended by sealant manufacturer. Backing shall be 25 to 33 percent oversize for closed cell and 40 to 50 percent oversize for open cell material, unless otherwise indicated. Backstop material shall be compatible with sealant. Do not use oakum and other types of absorptive materials as backstops.

2.4.1 Rubber

Cellular rubber sponge backing shall be ASTM D 1056, Type 2, closed cell, Class A, round cross section.

2.4.2 Synthetic Rubber

Synthetic rubber backing shall be ASTM C 509, Option I, Type I preformed rods or tubes.

2.4.3 Neoprene

Neoprene backing shall be ASTM D 1056, closed cell expanded neoprene cord Type 2, Class C, Grade 2C2.

2.5 CAULKING

Caulking is prohibited. Use sealant all locations.

2.6 CLEANING SOLVENTS

Provide type(s) recommended by the sealant manufacturer except for aluminum and bronze surfaces that will be in contact with sealant.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Surfaces shall be clean, dry to the touch, and free from dirt frost, moisture, grease, oil, wax, lacquer, paint, or other foreign matter that would tend to destroy or impair adhesion. Oil and grease shall be removed with solvent and surfaces shall be wiped dry with clean cloths. When resealing an existing joint, remove existing calk or sealant prior to applying new sealant. For surface types not listed below, the sealant manufacturer shall be contacted for specific recommendations.

3.1.1 Steel Surfaces

Remove loose mill scale by scraping and wire brushing. Remove protective coatings using a residue-free solvent.

3.1.2 Aluminum Surfaces

Remove temporary protective coatings from surfaces that will be in contact with sealant. When masking tape is used as a protective coating, remove tape and any residual adhesive just prior to sealant application. For removing protective coatings and final cleaning, use nonstaining solvents recommended by the manufacturer of the item(s) containing aluminum or bronze surfaces.

3.1.3 Concrete and Masonry Surfaces

Where surfaces have been treated with curing compounds, oil, or other such materials, the materials shall be removed by sandblasting or wire brushing. Laitance, efflorescence and loose mortar shall be removed from the joint cavity.

3.2 SEALANT PREPARATION

Do not add liquids, solvents, or powders to the sealant. Mix multicomponent elastomeric sealants in accordance with manufacturer's instructions.

3.3 APPLICATION

3.3.1 Joint Width-To-Depth Ratios

a. Acceptable Ratios:

JOINT WIDTH	JOINT DEPTH Minimum	JOINT DEPTH Maximum
For metal, glass, or other nonporous surfaces:		
1/4 inch (minimum)	1/4 inch	1/4 inch
over 1/4 inch	1/2 of width	Equal to width
For wood, concrete:		
1/4 inch (minimum)	1/4 inch	1/4 inch
Over 1/4 inch to 1/2 inch	1/4 inch	Equal to width
Over 1/2 inch to 2 inches	1/2 inch	5/8 inch
Over 2 inches	(As recommended by sealant manufacturer)	

b. Unacceptable Ratios: Where joints of acceptable width-to-depth ratios have not been provided, clean out joints to acceptable depths and grind or cut to acceptable widths without damage to the adjoining work. Grinding shall not be required on metal surfaces.

3.3.2 Masking Tape

Masking tape shall be placed on the finish surface on one or both sides of a joint cavity to protect adjacent finish surfaces from primer or sealant smears. Masking tape shall be removed within 10 minutes after joint has been filled and tooled.

3.3.3 Backstops

Install backstops dry and free of tears or holes. Tightly pack the back or bottom of joint cavities with backstop material to provide a joint of the depth specified. Install backstops in the following locations:

a. Where indicated.

b. Where backstop is not indicated but joint cavities exceed the acceptable maximum depths specified in paragraph entitled, "Joint Width-to-Depth Ratios."

3.3.4 Primer

Immediately prior to application of the sealant, clean out loose particles

from joints. Where recommended by sealant manufacturer, apply primer to joints in concrete masonry units, wood, and other porous surfaces in accordance with sealant manufacturer's instructions. Do not apply primer to exposed finish surfaces.

3.3.5 Bond Breaker

Provide bond breakers to the back or bottom of joint cavities, as recommended by the sealant manufacturer for each type of joint and sealant used, to prevent sealant from adhering to these surfaces. Carefully apply the bond breaker to avoid contamination of adjoining surfaces or breaking bond with surfaces other than those covered by the bond breaker.

3.3.6 Sealants

Provide a sealant compatible with the material(s) to which it is applied. Do not use a sealant that has exceeded shelf life or has jelled and can not be discharged in a continuous flow from the gun. Apply the sealant in accordance with the manufacturer's instructions with a gun having a nozzle that fits the joint width. Force sealant into joints to fill the joints solidly without air pockets. Tool sealant after application to ensure adhesion. Sealant shall be uniformly smooth and free of wrinkles. Upon completion of sealant application, roughen partially filled or unfilled joints, apply sealant, and tool smooth as specified. Sealer shall be applied over the sealant when and as specified by the sealant manufacturer.

3.4 PROTECTION AND CLEANING

3.4.1 Protection

Protect areas adjacent to joints from sealant smears. Masking tape may be used for this purpose if removed 5 to 10 minutes after the joint is filled.

3.4.2 Final Cleaning

Upon completion of sealant application, remove remaining smears and stains and leave the work in a clean and neat condition.

a. Masonry and Other Porous Surfaces: Immediately scrape off fresh sealant that has been smeared on masonry and rub clean with a solvent as recommended by the sealant manufacturer. Allow excess sealant to cure for 24 hour then remove by wire brushing or sanding.

b. Metal and Other Non-Porous Surfaces: Remove excess sealant with a solvent-moistened cloth.

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SECTION 08110

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SECTION 08110

STEEL DOORS AND FRAMES

05/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A250.3	(1999) Test Procedure and Acceptance Criteria for Factory Applied Finish Painted Steel Surfaces for Steel Doors and Frames
ANSI A250.4	(1994) Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings
ANSI A250.6	(1997) Hardware on Standard Steel Doors (Reinforcement - Application)
ANSI A250.8	(1998) SDI-100 Recommended Specifications for Standard Steel Doors and Frames

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 591	(1998) Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications
ASTM C 578	(1995) Rigid, Cellular Polystyrene Thermal Insulation
ASTM C 591	(1994) Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation
ASTM C 612	(1993) Mineral Fiber Block and Board Thermal Insulation
ASTM D 2863	(1997) Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index)

DOOR AND HARDWARE INSTITUTE (DHI)

BHMA A115	(1991) Steel Door Preparation Standards (Consisting of A115.1 through A115.6 and A115.12 through A115.18)

HOLLOW METAL MANUFACTURERS ASSOCIATION (HMMA)

NAAMM HMMA HMM	(1992) Hollow Metal Manual

STEEL DOOR INSTITUTE (SDOI)

SDI 105	(1998) Recommended Erection Instructions for Steel Frames
SDI 113	(1979) Apparent Thermal Performance of STEEL DOOR and FRAME ASSEMBLIES

1.2 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-02 Shop Drawings

Doors; G, AE.

Frames; G, AE.

Accessories

Show elevations, construction details, metal gages, hardware provisions, method of glazing, and installation details.

Schedule of doors; G, AE.

Schedule of frames; G, AE.

Submit door and frame locations.

SD-03 Product Data

Doors; G, AE.

Frames; G, AE.

Accessories.

Submit manufacturer's descriptive literature for doors, frames, and accessories. Include data and details on door construction, panel (internal) reinforcement, insulation, and door edge construction. When "custom hollow metal doors" are provided in lieu of "standard steel doors," provide additional details and data sufficient for comparison to ANSI A250.8 requirements.

SD-04 Samples

Factory-applied enamel finish; G, AE.

Local Materials

Report stating which products and their quantities by cost which were manfactured within 500 miles of the project.

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver doors, frames, and accessories undamaged and with protective wrappings or packaging. Provide temporary steel spreaders securely fastened to the bottom of each welded frame. Store doors and frames on platforms under cover in clean, dry, ventilated, and accessible locations, with 1/4 inch airspace between doors. Remove damp or wet packaging immediately and wipe affected surfaces dry. Replace damaged materials with new.

1.4 GENERAL REQUIREMENTS

Contractor shall, as much as possible, select material manufacturers that are located within 500 miles of the project.

PART 2 PRODUCTS

2.1 STANDARD STEEL DOORS

ANSI A250.8, except as specified otherwise. Prepare doors to receive hardware specified in Section 08710, "Door Hardware." Undercut where indicated. Exterior doors shall have top edge closed flush and sealed to prevent water intrusion. Doors shall be 1 3/4 inches thick, unless otherwise indicated.

2.1.1 Classification - Level, Performance, Model

2.1.1.1 Heavy Duty Doors

ANSI A250.8, Level 2, physical performance Level B, Model 1, with core construction as required by the manufacturer for exterior doors, of size(s) and design(s) indicated. Provide Level II for all exterior steel doors.

2.2 CUSTOM HOLLOW METAL DOORS

Provide custom hollow metal doors where nonstandard steel doors are indicated. At the Contractor's option, custom hollow metal doors may be provided in lieu of standard steel doors. Door size(s), design, materials, construction, gages, and finish shall be as specified for standard steel doors and shall comply with the requirement of NAAMM HMMA HMM. Fill all spaces in doors with insulation. Close top and bottom edges with steel channels not lighter than 16 gage. Close tops of exterior doors flush with an additional channel and seal to prevent water intrusion. Prepare doors to receive hardware specified in Section 08710, "Door Hardware." Doors shall be 1 3/4 inches thick, unless otherwise indicated.

2.3 INSULATED STEEL DOOR SYSTEMS

Insulated steel doors shall have a core of polyurethane foam and an R factor of 10.0 or more (based on a k value of 0.16); face sheets, edges, and frames of galvanized steel not lighter than 23 gage, 16 gage, and 16 gage respectively; magnetic weatherstripping; nonremovable-pin hinges; thermal-break aluminum threshold; and vinyl door bottom. Doors and frames shall receive phosphate treatment, rust-inhibitive primer, and baked acrylic enamel finish. Doors shall have been tested in accordance with ANSI A250.4 and shall have met the requirements for Level C. Prepare doors to receive hardware specified in Section 08710, "Door Hardware." Doors shall be 1 3/4 inches thick. Provide insulated steel doors and frames for all exterior locations.

2.4 ACCESSORIES

2.4.1 Louvers

Louvers in doors are prohibited.

2.4.2 Moldings

Provide moldings around glass of interior and exterior doors and louvers of interior doors. Provide nonremovable moldings on outside of exterior doors. Secure inside moldings to stationary moldings, or provide snap-on moldings. Muntins shall interlock at intersections and shall be fitted and welded to stationary moldings.

2.5 INSULATION CORES

Insulated cores shall be of type specified, and provide an apparent U-factor of .48 in accordance with SDI 113 and shall conform to:

a. Rigid Polyurethane Foam: ASTM C 591, Type 1 or 2, foamed-in-place or in board form, with oxygen index of not less than 22 percent when tested in accordance with ASTM D 2863; or

b. Rigid Polystyrene Foam Board: ASTM C 578, Type I or II; or

c. Mineral board: ASTM C 612, Type I.

2.6 STANDARD STEEL FRAMES

ANSI A250.8, except as otherwise specified. Form frames to sizes and shapes indicated, with welded corners. Provide steel frames for doors, and interior glazed panels, unless otherwise indicated.

2.6.1 Welded Frames

Continuously weld frame faces at corner joints. Mechanically interlock or continuously weld stops and rabbets. Grind welds smooth.

2.6.2 Mullions

Mullions shall be closed or tubular construction and shall member with heads and jambs butt-welded thereto.

2.6.3 Stops and Beads

Form stops and beads from 20 gage steel. Provide for glazed and other openings in standard steel frames. Secure beads to frames with oval-head, countersunk Phillips self-tapping sheet metal screws or concealed clips and fasteners. Space fasteners approximately 12 to 16 inches on centers. Miter molded shapes at corners. Butt or miter square or rectangular beads at corners.

2.6.4 Anchors

Provide anchors to secure the frame to adjoining construction. Provide steel anchors, zinc-coated or painted with rust-inhibitive paint, not lighter than 18 gage.

2.6.4.1 Wall Anchors

Provide at least three anchors for each jamb. For frames which are more than 7.5 feet in height, provide one additional anchor for each jamb for each additional 2.5 feet or fraction thereof.

a. Masonry: Provide anchors of corrugated or perforated steel straps or 3/16 inch diameter steel wire, adjustable or T-shaped;

b. Stud partitions: Weld or otherwise securely fasten anchors to backs of frames. Design anchors to be fastened to closed steel studs with sheet metal screws, and to open steel studs by wiring or welding;

2.6.4.2 Floor Anchors

Provide floor anchors drilled for 3/8 inch anchor bolts at bottom of each jamb member.

2.7 WEATHERSTRIPPING

As specified in Section 08710, "Door Hardware."

2.8 HARDWARE PREPARATION

Provide minimum hardware reinforcing gages as specified in ANSI A250.6. Drill and tap doors and frames to receive finish hardware. Prepare doors and frames for hardware in accordance with the applicable requirements of ANSI A250.8 and ANSI A250.6. For additional requirements refer to BHMA A115. Drill and tap for surface-applied hardware at the project site. Build additional reinforcing for surface-applied hardware into the door at the factory. Locate hardware in accordance with the requirements of ANSI A250.8, as applicable. Punch door frames, with the exception of frames that will have weatherstripping, to receive a minimum of two rubber or vinyl door silencers on lock side of single doors and one silencer for each leaf at heads of double doors. Set lock strikes out to provide clearance for silencers.

2.9 FINISHES

2.9.1 Factory-Primed Finish

All surfaces of doors and frames shall be thoroughly cleaned, chemically treated and factory primed with a rust inhibiting coating as specified in ANSI A250.8.

2.9.2 Electrolytic Zinc-Coated Anchors and Accessories

Provide electrolytically deposited zinc-coated steel in accordance with ASTM A 591, Commercial Quality, Coating Class A. Phosphate treat and factory prime zinc-coated surfaces as specified in ANSI A250.8.

2.9.3 Factory-Applied Enamel Finish

Coatings shall meet test procedures and acceptance criteria in accordance with ANSI A250.3. After factory priming, apply two coats of medium-gloss enamel to exposed surfaces. Separately bake or oven dry each coat. Drying time and temperature requirements shall be in accordance with the coating

manufacturer's recommendations. Color(s) of finish coat shall be as indicatedon the drawings and shall match approved color sample(s).

2.10 FABRICATION AND WORKMANSHIP

Finished doors and frames shall be strong and rigid, neat in appearance, and free from defects, waves, scratches, cuts, dents, ridges, holes, warp, and buckle. Molded members shall be clean cut, straight, and true, with joints coped or mitered, well formed, and in true alignment. Dress exposed welded and soldered joints smooth. Design door frame sections for use with the wall construction indicated. Corner joints shall be well formed and in true alignment. Conceal fastenings where practicable. Design frames in exposed masonry walls or partitions to allow sufficient space between the inside back of trim and masonry to receive sealant.

2.10.1 Grouted Frames

For frames to be installed in exterior walls and to be filled with mortar or grout, fill the stops with strips of rigid insulation to keep the grout out of the stops and to facilitate installation of stop-applied head and jamb seals.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Frames

Set frames in accordance with SDI 105. Plumb, align, and brace securely until permanent anchors are set. Anchor bottoms of frames with expansion bolts or powder-actuated fasteners. Build in or secure wall anchors to adjoining construction. Backfill frames with mortar. When an additive is provided in the mortar, coat inside of frames with corrosion-inhibiting bituminous material. For frames in exterior walls, ensure that stops are filled with rigid insulation before grout is placed.

3.1.2 Doors

Hang doors in accordance with clearances specified in ANSI A250.8. After erection and glazing, clean and adjust hardware.

3.2 PROTECTION

Protect doors and frames from damage. Repair damaged doors and frames prior to completion and acceptance of the project or replace with new, as directed. Wire brush rusted frames until rust is removed. Clean thoroughly. Apply an all-over coat of rust-inhibitive paint of the same type used for shop coat.

3.3 CLEANING

Upon completion, clean exposed surfaces of doors and frames thoroughly. Remove mastic smears and other unsightly marks.

-- End of Section --

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SECTION 08120

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09/99

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SECTION 08120

ALUMINUM DOORS AND FRAMES
09/99

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ALUMINUM ASSOCIATION (AA)

AA DAF-45	(1980) Aluminum Finishes

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 36	(1997; Rev. A) Carbon Structural Steel
ASTM B 209	(1996) Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B 221	(1996) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM E 283	(1991) Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
ASTM E 331	(1996) Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference

1.2 PERFORMANCE REQUIREMENTS

1.2.1 Structural

Shapes and thicknesses of framing members shall be sufficient to withstand the design wind load indicated with a deflection of not more than 1/175 times the length of the member and a safety factor of not less than 1.65. Provide glazing beads, moldings, and trim of not less than 0.050 inch nominal thickness.

1.2.2 Air Infiltration

When tested in accordance with ASTM E 283, air infiltration shall not exceed 0.06 cubic feet per minute per square foot of fixed area at a test pressure of 6.24 pounds per square foot (50 mile per hour wind).

1.2.3 Water Penetration

When tested in accordance with ASTM E 331, there shall be no water penetration at a pressure of 8 pounds per square foot of fixed area.

1.3 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-02 Shop Drawings

Doors and frames; G, AE.

Show elevations of each door type, size of doors and frames, metal gages, details of door and frame construction, methods of anchorage, glazing details, weatherstripping, provisions for and location of hardware, and details of installation.

SD-04 Samples

Finishes; G, AE.

Samples Of the color anodized coating, showing the extreme color range.

SD-07 Certificates

Local Materials.

Report stating which products and their quantities by cost which were manufactured within 500 miles of the project.

SD-08 Manufacturer's Instructions

Doors and frames; .

Submit detail specifications and instructions for installation, adjustments, cleaning, and maintenance.

1.4 DELIVERY, STORAGE, AND HANDLING

Inspect materials delivered to the site for damage. Unload and store with minimum handling. Provide storage space in dry location with adequate ventilation, free from dust or water, and easily accessible for inspection and handling. Stack materials on nonabsorptive strips or wood platforms. Do not cover doors and frames with tarps, polyethylene film, or similar coverings. Protect finished surfaces during shipping and handling using manufacturer's standard method, except that no coatings or lacquers shall be applied to surfaces to which calking and glazing compounds must adhere.

1.5 GENERAL REQUIREMENTS

Contractor shall, as much as possible, select material manufacturers that are located with 500 miles of the project.

PART 2 PRODUCTS

2.1 DOORS AND FRAMES

Swing-type aluminum doors and frames of size, design, and location indicated. Provide doors complete with frames, framing members, transoms, adjoining sidelights, trim, and accessories.

2.2 MATERIALS

2.2.1 Anchors

Stainless steel.

2.2.2 Weatherstripping

Continuous wool pile, silicone treated, or type recommended by door manufacturer.

2.2.3 Aluminum Alloy for Doors and Frames

ASTM B 221, Alloy 6063-T5 for extrusions. ASTM B 209, alloy and temper best suited for aluminum sheets and strips.

2.2.4 Fasteners

Hard aluminum or stainless steel.

2.2.5 Structural Steel

ASTM A 36.

2.2.6 Aluminum Paint

Type as recommended by aluminum door manufacturer.

2.3 FABRICATION

2.3.1 Aluminum Frames

Extruded aluminum shapes with contours approximately as indicated. Provide removable glass stops and glazing beads for frames accommodating fixed glass. Use countersunk stainless steel Phillips screws for exposed fastenings, and space not more than 12 inches o.c. Mill joints in frame members to a hairline fit, reinforce, and secure mechanically.

2.3.2 Aluminum Doors

Of type, size, and design indicated and not less than 1 3/4 inches thick. Minimum wall thickness, 0.125 inch, except beads and trim, 0.050 inch. Door sizes shown are nominal and shall include standard clearances as follows: 0.093 inch at hinge and lock stiles, 0.125 inch between meeting stiles, 0.125 inch at top rails, 0.187 inch between bottom and threshold, and 0.687 inch between bottom and floor. Bevel single-acting doors 0.063 or 0.125 inch at lock, hinge, and meeting stile edges.

2.3.2.1 Full Glazed Stile and Rail Doors

Doors shall have medium stiles and rails as indicated. Fabricate from extruded aluminum hollow seamless tubes or from a combination of open-shaped members interlocked or welded together. Fasten top and bottom rail together by means of welding or by 3/8 or 1/2 inch diameter cadmium-plated tensioned steel tie rods. Provide an adjustable mechanism of jack screws or other methods in the top rail to allow for minor clearance adjustments after installation.

2.3.3 Welding and Fastening

Where possible, locate welds on unexposed surfaces. Dress welds on exposed surfaces smoothly. Select welding rods, filler wire, and flux to produce a uniform texture and color in finished work. Remove flux and spatter from surfaces immediately after welding. Exposed screws or bolts will be permitted only in inconspicuous locations, and shall have countersunk heads. Weld concealed reinforcements for hardware in place.

2.3.4 Weatherstripping

Provide on stiles and rails of exterior doors. Fit into slots which are integral with doors or frames. Weatherstripping shall be replaceable without special tools, and adjustable at meeting rails of pairs of doors. Installation shall allow doors to swing freely and close positively. Air leakage of a single leaf weatherstripped door shall not exceed 0.5 cubic feet per minute of air per square foot of door area when tested in accordance with ASTM E 283.

2.3.5 Anchors

On the backs of subframes, provide anchors of the sizes and shapes indicated for securing subframes to adjacent construction. Anchor transom bars at ends and mullions at head and sill. Place anchors near top and bottom of each jamb and at intermediate points not more than 25 inches apart.

2.3.6 Provisions for Hardware

Hardware is specified in Section 08710, "Door Hardware." Deliver hardware templates and hardware (except field-applied hardware) to the door manufacturer for use in fabrication of aluminum doors and frames. Cut, reinforce, drill, and tap doors and frames at the factory to receive template hardware. Provide doors to receive surface-applied hardware, except push plates, kick plates, and mop plates, with reinforcing only; drill and tap in the field. Provide hardware reinforcements of stainless steel or steel with hot-dipped galvanized finish, and secure with stainless steel screws.

2.3.7 Provisions for Glazing

Provide extruded aluminum snap-in glazing beads on interior side of doors. Provide extruded aluminum, theft-proof, snap-in glazing beads or fixed glazing beads on exterior or security side of doors. Glazing beads shall have vinyl insert glazing gaskets. Design glazing beads to receive glass of thickness indicated or specified. Glazing is specified in Section 08800, "Glazing."

2.3.8 Finishes

Provide exposed aluminum surfaces with factory finish of anodic coating or organic coating.

2.3.8.1 Anodic Coating

Clean exposed aluminum surfaces and provide an anodized finish conforming to AA DAF-45. Finish shall be integral color-anodized, designation AA-M10-C22-A42, Architectural Class I 0.7 mil or thicker . Color shall be as indicated.

PART 3 EXECUTION

3.1 INSTALLATION

Plumb, square, level, and align frames and framing members to receive doors, transoms, and adjoining sidelights. Anchor frames to adjacent construction as indicated and in accordance with manufacturer's printed instructions. Anchor bottom of each frame to rough floor construction with 3/32 inch thick stainless steel angle clips secured to back of each jamb and to floor construction; use stainless steel bolts and expansion rivets for fastening clip anchors. Seal metal-to-metal joints between framing members as specified in Section 07920, "Joint Sealants." Hang doors to produce clearances specified in paragraph entitled "Aluminum Doors," of this section. After erection and glazing, adjust doors and hardware to operate properly.

3.2 PROTECTION FROM DISSIMILAR MATERIALS

3.2.1 Dissimilar Metals

Where aluminum surfaces come in contact with metals other than stainless steel, zinc, or small areas of white bronze, protect from direct contact by one or a combination of the following methods:

a. Paint the dissimilar metal with one coat of heavy-bodied bituminous paint.

b. Apply a good quality elastomeric sealant between the aluminum and the dissimilar metal.

c. Paint the dissimilar metal with one coat of primer and one coat of aluminum paint.

d. Use a nonabsorptive tape or gasket in permanently dry locations.

3.2.2 Drainage from Dissimilar Metals

In locations where drainage from dissimilar metals has direct contact with aluminum, provide protective paint, to prevent aluminum discoloration.

3.2.3 Masonry and Concrete

Provide aluminum surfaces in contact with mortar, concrete, or other masonry materials with one coat of heavy-bodied bituminous paint.

3.2.4 Wood or Other Absorptive Materials

Provide aluminum surfaces in contact with absorptive materials subject to frequent moisture, and aluminum surfaces in contact with treated wood, with two coats of aluminum paint or one coat of heavy-bodied bituminous paint. In lieu of painting the aluminum, the Contractor shall have the option of painting the wood or other absorptive surface with two coats of aluminum paint and sealing the joints with elastomeric sealant.

3.3 CLEANING

Upon completion of installation, clean door and frame surfaces in accordance with door manufacturer's recommended procedure. Do not use abrasive, caustic, or acid cleaning agents.

3.4 PROTECTION

Protect doors and frames from damage and from contamination by other materials such as cement mortar. Prior to completion and acceptance of the work, restore damaged doors and frames to original condition, or replace with new ones.

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SECTION 08210

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09/99

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SECTION 08210

WOOD DOORS
09/99

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 152	(1981; Rev. A) Fire Tests of Door Assemblies

ARCHITECTURAL WOODWORK INSTITUTE (AWI)

AWI Qual Stds	(1997) Architectural Woodwork Quality Standards and Quality Certification Program

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 80	(1995) Fire Doors and Fire Windows
NFPA 252	(1995) Fire Tests of Door Assemblies

WINDOW AND DOOR MANUFACTURERS ASSOCIATION (WDMA)

WDMA I.S. 1-A	(1993) Architectural Wood Flush Doors
WDMA TM-5	(1990) Split Resistance Test
WDMA TM-7	(1990) Cycle - Slam Test
WDMA TM-8	(1990) Hinge Loading Resistance Test

UNDERWRITERS LABORATORIES (UL)

UL 10B	(1997) Fire Tests of Door Assemblies

1.2 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-02 Shop Drawings

Doors; G, AE.

Submit drawings or catalog data showing each type of door unit. Drawings and data shall indicate door type and construction, sizes, thickness, methods of assembly, and glazing.

SD-03 Product Data

Doors; G, AE.

Accessories

Water-resistant sealer

Sample warranty

Fire resistance rating; G, AE.

Adhesives

Manufacturer's descriptive date, documentation stating physical characteristics, and mildew and germicidal characteristics. Material Safety Data Sheets (MSDS) for all primers and adhesives shall be provided to the Contracting Officer. Highlight VOC emissions.

SD-04 Samples

Doors

Prior to the delivery of wood doors, submit a sample section of each type of door which shows the stile, rail, veneer, finish, and core construction.

Door finish colors; G, AE.

Submit a minimum of three color selection samples.

SD-06 Test Reports

Split resistance

Cycle-slam

Hinge loading resistance

Submit split resistance test report for doors tested in accordance with WDMA TM-5, cycle-slam test report for doors tested in accordance with WDMA TM-7, and hinge loading resistance test report for doors tested in accordance with WDMA TM-8.

SD-07 Certificates

Local Materials.

Reports stating which products and their quantities by cost which were manufactured within 500 miles of the project.

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver doors to the site in an undamaged condition and protect against damage and dampness. Stack doors flat under cover. Support on blocking, a minimum of 4 inches thick, located at each end and at the midpoint of the door. Store doors in a well-ventilated building so that they will not be

exposed to excessive moisture, heat, dryness, direct sunlight, or extreme changes of temperature and humidity. Do not store in a building under construction until concrete, masonry work, and plaster are dry. Replace defective or damaged doors with new ones.

1.4 WARRANTY

Warranty shall warrant doors free of defects as set forth in the door manufacturer's standard door warranty.

1.5 GENERAL REQUIREMENTS

Contractor shall, as much as possible, select material manufacturers that are located within 500 miles of the project.

PART 2 PRODUCTS

2.1 DOORS

Provide doors of the types, sizes, and designs indicated.

2.1.1 Flush Doors

Flush doors shall conform to WDMA I.S. 1-A. Hollow core doors shall have lock blocks and one inch minimum thickness hinge stile. Stile edge bands of doors to receive natural finish shall be hardwood, compatible with face veneer. Stile edge bands of doors to be painted shall be mill option specie. No visible finger joints will be accepted in stile edge bands. When used, locate finger-joints under hardware.

2.1.1.1 Interior Flush Doors

Provide staved lumber core, Type II flush doors conforming to WDMA I.S. 1-A with faces of premium grade natural birch. Hardwood veneers shall be plain slicedbook matched.

2.1.2 Fire Doors

Doors specified or indicated to have a fire resistance rating shall conform to the requirements of UL 10B, ASTM E 152, or NFPA 252 for the class of door indicated. Affix a permanent metal label with raised or incised markings indicating testing agency's name and approved hourly fire rating to hinge edge of each door.

2.2 ACCESSORIES

2.2.1 Door Louvers

Louvers in doors are prohibited.

2.2.2 Door Light Openings

Provide glazed openings with the manufacturer's standard wood moldings except that moldings for doors to receive natural finish shall be of the same specie and color as the face veneers. Moldings for flush doors shall be lip type. Glazing is specified in Section 08800, "Glazing."

2.2.3 Additional Hardware Reinforcement

Provide fire rated doors with hardware reinforcement blocking. Size of lock blocks shall be as required to secure the hardware specified. Reinforcement blocking shall be in compliance with the manufacturer's labeling requirements and shall not be mineral material similar to the core.

2.3 FABRICATION

2.3.1 Marking

Each door shall bear a stamp, brand, or other identifying mark indicating quality and construction of the door.

2.3.2 Quality and Construction

Identify the standard on which the construction of the door was based.

2.3.3 Adhesives and Bonds

WDMA I.S. 1-A. Use Type II bond for interior doors. Adhesive for doors to receive a natural finish shall be nonstaining. VOC content must be less than the current VOC content limits of SCAQMD Rule #1168.

2.3.4 Prefitting

At the Contractor's option, doors may be provided factory pre-fit. Doors shall be sized and machined at the factory by the door manufacturer in accordance with the standards under which they are produced. The work shall include sizing, bevelling edges, mortising, and drilling for hardware and providing necessary beaded openings for glass and louvers. Provide the door manufacturer with the necessary hardware samples, and frame and hardware schedules as required to coordinate the work.

2.3.5 Finishes

2.3.5.1 Factory Finish

Provide doors finished at the factory by the door manufacturer as follows: AWI Qual Stds Section 1500, specification for System No. 4 Conversion varnish alkyd urea or System No. 5 Vinyl catalyzed. The coating shall be AWI Qual Stds premium, medium rubbed sheen, closed grain effect. Use stain when required to produce the finish specified for color. Seal edges, cutouts, trim, and wood accessories, and apply two coats of finish compatible with the door face finish. Touch-up finishes that are scratched or marred, or where exposed fastener holes are filled, in accordance with the door manufacturer's instructions. Match color and sheen of factory finish using materials compatible for field application.

2.3.5.2 Color

Provide door finish color of "natural-no stain".

2.3.6 Water-Resistant Sealer

Provide a water-resistant sealer compatible with the specified finish as approved and as recommended by the door manufacturer.

2.4 SOURCE QUALITY CONTROL

Stiles of "B" and "C" label fire doors utilizing standard mortise leaf hinges shall meet the following performance criteria:

a. Split resistance: Average of ten test samples shall be not less than 500 pounds load when tested in accordance with WDMA TM-5.

b. Cycle-slam: 200,000 cycles with no loose hinge screws or other visible signs of failure when tested in accordance with the requirements of WDMA TM-7.

c. Hinge loading resistance: Average of ten test samples shall be not less than 700 pounds load when tested for direct screw withdrawal in accordance with WDMA TM-8 using a No. 12, 1 1/4 inch long, steel, fully threaded wood screw. Drill 5/32 inch pilot hole, use 1 1/2 inch opening around screw for bearing surface, and engage screw full, except for last 1/8 inch. Do not use a steel plate to reinforce screw area.

PART 3 EXECUTION

3.1 INSTALLATION

Before installation, seal top and bottom edges of doors with the approved water-resistant sealer. Seal cuts made on the job immediately after cutting using approved water-resistant sealer. Fit, trim, and hang doors with a 1/16 inch minimum, 1/8 inch maximum clearance at sides and top, and a 3/16 inch minimum, 1/4 inch maximum clearance over thresholds. Provide 3/8 inch minimum, 7/16 inch maximum clearance at bottom where no threshold occurs. Bevel edges of doors at the rate of 1/8 inch in 2 inches. Door warp shall not exceed 1/4 inch when measured in accordance with WDMA I.S. 1-A.

3.1.1 Fire Doors

Install fire doors in accordance with NFPA 80. Do not paint over labels.

3.1.2 Prehung Doors

Install doors in accordance with the manufacturer's instructions and details. Provide fasteners for stops and casing trim within 3 inches of each end and spaced 11 inches on centers maximum. Provide side and head jambs joined together with a dado or notch of 3/16 inch minimum depth.

3.1.3 Sound Gasketing and Seals

Install doors in strict accordance with the manufacturer's printed instructions and details. Apply sound seals to door frames at jambs and head.

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SECTION 08520

ALUMINUM AND ENVIRONMENTAL CONTROL ALUMINUM WINDOWS

10/03

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SECTION 08520

ALUMINUM AND ENVIRONMENTAL CONTROL ALUMINUM WINDOWS
10/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ALUMINUM ASSOCIATION (AA)

AA DAF-45	(1997) Designation System for Aluminum Finishes

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 101	(1997) Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 283	(1991) Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
ASTM E 330	(1997el) Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
ASTM E 547	(1996) Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential

INSECT SCREENING WEAVERS ASSOCIATION (ISWA)

ISWA IWS 089	(1990) Recommended Standards and Specifications for Insect Wire Screening (Wire Fabric)

NATIONAL FENESTRATION RATING COUNCIL (NFRC)

NFRC 100	(1997) Procedure for Determing Fenestration Product U-factors
NFRC 200	(1997) Procedure for Determining Fenestration Product Solar Heat Gain Coefficients at Normal Incidence

SCREEN MANUFACTURERS ASSOCIATION (SMA)

SMA 1004 (1987) Aluminum Tubular Frame Screens for Windows

1.2 WINDOW PERFORMANCE

Aluminum windows shall meet the following performance requirements. Testing requirements shall be performed by an independent testing laboratory or agency.

1.2.1 Structural Performance

Structural test pressures on window units shall be for positive load (inward) and negative load (outward) in accordance with ASTM E 330. After testing, there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or actuating mechanisms or any other damage which could cause window to be inoperable. There shall be no permanent deformation of any main frame, sash or ventilator member in excess of the requirements established by AAMA 101 for the window types and classification specified in this section.

1.2.2 Air Infiltration

Air infiltration shall not exceed the amount established by AAMA 101 for each window type when tested in accordance with ASTM E 283.

1.2.3 Water Penetration

Water penetration shall not exceed the amount established by AAMA 101 for each window type when tested in accordance with ASTM E 547.

1.2.4 Thermal Performance

Thermal transmittance for thermally broken aluminum windows with insulating glass shall not exceed a U-factor of 0.40 Btu/hr-ft^2-F determined according to NFRC 100, and a solar heat gain coefficient (SHGC) of0.55 Btu/hr-ft^2-F determined according to NFRC 200. Window units shall comply with the U.S. Department of Energy, Energy Star Window Program for the Central Climate Zone.

1.2.5 Condensation Index Rating

The condensation index rating shall be 85 as determined using NFRC approved software THERM.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Aluminum Windows; G, AE.
Insect Screens; G, AE.

Drawings indicating elevations of window, rough-opening dimensions for each type and size of window, full-size sections, thicknesses of metal, fastenings, methods of installation and anchorage, connections with other work, type of wall construction, size and spacing of anchors, method of glazing, mullion details, weatherstripping details, screen details including method of attachment, and window schedules showing locations of each window type.

SD-03 Product Data

Aluminum Windows; G, AE.

Manufacturer's descriptive data and catalog cut sheets.

Manufacturer's preprinted installation instructions and cleaning instructions.

SD-04 Samples

Aluminum Windows; G, AE.

Submit three color samples of the specified finishes.

SD-06 Test Reports

Aluminum Windows.

Reports for each type of aluminum window attesting that identical windows have been tested and meet all performance requirements established under paragraph WINDOW PERFORMANCE.

SD-07 Certificates

Aluminum Windows.

Certificates stating that the aluminum windows are AAMA certified conforming to requirements of this section. Labels or markings permanently affixed to the window will be accepted in lieu of certificates. Product ratings determined using NFRC 100 and NFRC 200 shall be authorized for certification and properly labeled by the manufacturer.

1.4 QUALIFICATION

Window manufacturer shall specialize in designing and manufacturing the type of aluminum windows specified in this section, and shall have a minimum of 5 years of documented successful experience. Manufacturer shall have the facilities capable of meeting contract requirements, single-source responsibility and warranty.

1.5 DELIVERY AND STORAGE

Aluminum windows shall be delivered to project site and stored in accordance with manufacturer's recommendations. Damaged windows shall be replaced with new windows.

1.6 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a 1 year period shall be provided.

PART 2 PRODUCTS

2.1 ALUMINUM WINDOW TYPES

Aluminum windows shall consist of complete units including sash, glass, frame, weatherstripping. Windows shall conform to AAMA 101. Windows shall be thermal break type double-glazed. Thermal barrier shall be neoprene, rigid vinyl, or polyurethane and shall be resistant to weather. Window members shall be heli-arc welded or angle-reinforced and mechanically joined and sealed. Exposed welded joints shall be dressed and finished. Joints shall be permanent and weathertight. Frames shall be constructed to provide a minimum 1/4 inch thermal break between the exterior and interior frame surfaces. Sash corners shall be internally sealed to prevent air and water leaks. Inner sash shall be key-controlled to swing to the interior to allow maintenance and replacement of the glass. Not less than 5 control keys shall be furnished. Operable windows shall permit cleaning the outside glass from inside the building.

2.1.1 Single-Hung Windows

Aluminum single-hung windows shall conform to AAMA 101 type which operate vertically with the weight of sash offset by a counterbalancing mechanism mounted in window to hold the sash stationary at any open position. Windows shall be provided with a tilt-in sash. Single-hung and double-hung windows shall be provided with locking devices to secure the sash in the closed position. Counterbalancing mechanisms shall be easily replaced after installation.

2.1.2 Operation

Single-hung windows shall have top sash operable and bottom sash fixed.

2.1.3 Fixed Windows

Aluminum fixed windows shall conform to AAMA 101 F-HC40 type, non-operable glazed frame, complete with provisions for reglazing in the field.

2.2 WEATHERSTRIPPING

Weatherstripping for ventilating sections shall be of type designed to meet water penetration and air infiltration requirements specified in this section in accordance with AAMA 101, and shall be manufactured of material compatible with aluminum and resistant to weather. Weatherstrips shall be factory-applied and easily replaced in the field. Neoprene or polyvinylchloride weatherstripping are not acceptable where exposed to direct sunlight.

2.3 INSECT SCREENS

Insect screens shall be aluminum window manufacturer's standard design, and shall be provided where scheduled on drawings. Insect screens shall be fabricated of roll-formed tubular-shaped aluminum frames conforming to SMA 1004 and (18 x 16) aluminum mesh screening conforming with ISWA IWS 089, Type III.

2.4 ACCESSORIES

2.4.1 Fasteners

Fastening devices shall be window manufacturer's standard design made from aluminum, stainless steel, cadmium-plated steel, or nickel/chrome-plated steel in compliance with AAMA 101. Self-tapping sheet metal screws will not be acceptable for material thicker than 1/16 inch.

2.4.2 Window Anchors

Anchoring devices for installing windows shall be made of aluminum, cadmium-plated steel, stainless steel, or zinc-plated steel conforming to AAMA 101.

2.5 GLASS AND GLAZING

Aluminum windows shall be designed for inside glazing, field glazing, and for glass types scheduled on drawings and specified in Section 08800 "Glazing". Units shall be complete with glass and glazing provisions to meet AAMA 101. Glazing material shall be compatible with aluminum, and shall not require painting.

2.6 FINISH

2.6.1 Anodized Aluminum Finish

Exposed surfaces of aluminum windows shall be finished with anodic coating conforming to AA DAF-45: Architectural Class I, AA-M10-C22-A44, color anodic coating, 0.7 mil or thicker. Finish shall be free of scratches and other blemishes.

2.6.2 Color

Color shall be as indicated on the drawings.

PART 3 EXECUTION

3.1 INSTALLATION

Aluminum windows shall be installed in accordance with approved shop drawings and manufacturer's published instructions. Aluminum surfaces in contact with masonry, concrete, wood and dissimilar metals other than stainless steel, zinc, cadmium or small areas of white bronze, shall be protected from direct contact using protective materials recommended by AAMA 101. The completed window installation shall be watertight in accordance with Section 07920 "Joint Sealants". Glass and glazing shall be installed in accordance with requirements of this section and Section 08800 "Glazing".

3.2 ADJUSTMENTS AND CLEANING

3.2.1 Adjustments

Final operating adjustments shall be made after glazing work is complete. Operating sash or ventilators shall operate smoothly and shall be weathertight when in locked position.

3.2.2 Cleaning

Aluminum window finish and glass shall be cleaned on exterior and interior sides in accordance with window manufacturer's recommendations. Alkaline or abrasive agents shall not be used. Precautions shall be taken to avoid scratching or marring window finish and glass surfaces.

-- End of Section --

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SECTION 08710

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SECTION 08710

DOOR HARDWARE

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 283	(1991) Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

BHMA A156.1	(2000) Butts and Hinges
BHMA A156.3	(2001) Exit Devices
BHMA A156.4	(2000) Door Controls - Closers
BHMA A156.5	(2001) Auxiliary Locks & Associated Products
BHMA A156.6	(2001) Architectural Door Trim
BHMA A156.7	(2003) Template Hinge Dimensions
BHMA A156.8	(2000) Door Controls - Overhead Stops and Holders
BHMA A156.13	(2002) Mortise Locks & Latches
BHMA A156.16	(2002) Auxiliary Hardware
BHMA A156.18	(2000) Materials and Finishes
BHMA A156.19	(2002) Power Assist and Low Energy Power Operated Doors
BHMA A156.21	(2001) Thresholds

DOOR AND HARDWARE INSTITUTE (DHI)

DHI Keying Systems	(1989) Keying Systems and Nomenclature

DHI Locations for CSD	(1997) Recommended Locations for Architectural Hardware for Custom Steel Doors and Frames
DHI Locations for SSD	(1990) Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames
DHI ANSI/DHI A115.1G	(1994) Installation Guide for Doors and Hardware
DHI ANSI/DHI A115-W	(Varies) Wood Door Hardware Standards (Incl All5-W1 thru A115-W9)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 80	(1999) Fire Doors and Fire Windows
NFPA 101	(1997; Errata 97-1; TIA-97-1) Life Safety Code
NFPA 105	(1999) Installation of Smoke-Control Door Assemblies

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Hardware and Accessories; G, AE.

Manufacturer's descriptive data, technical literature, catalog cuts, and installation instructions. Spare parts data for locksets, exit devices, closers, and electro-magnetic closer holder release devices, after approval of the detail drawings, and not later than 1 month prior to the date of beneficial occupancy. The data shall include a complete list of parts and supplies, with current unit prices and source of supply.

SD-02 Shop Drawings

Hardware Schedule; G, AE.

Hardware schedule listing all items to be furnished. The schedule shall include for each item: the quantities; manufacturer's name and catalog numbers; the ANSI number specified, sizes; detail information or catalog cuts; finishes; door and frame size and materials; location and hardware set identification cross-references to drawings; corresponding reference standard type number or function number from manufacturer's catalog if not covered by ANSI or BHMA; and list of abbreviations and template numbers.

Prepare and submit hardware schedule in the following form:

Hardware Item	Quantity	Size	Reference Publication Type No.	Finish	Mfr. Name and Catalog No.	Key Control Symbols	UL Mark (If fire rated and listed)	ANSI/BHMA Finish Designation

Keying System; G, AE.

Keying schedule developed in accordance with DHI Keying Systems, after the keying meeting with the user. Before any hardware is delivered, a proposed keying system schedule shall be prepared and submitted to the Contracting Officer for approval. The lock manufacturer and/or their supplier must be furnished by the contractor with this project number, contract number, title, street address, and building number before correct schedule can be developed. The Base locksmith shall be contacted to secure exiting key codes/bitting if necessary to successfully master key new work under this contract.

SD-11 Closeout Submittals

Submit key bitting charts to the Contracting Officer prior to completion of the work. Include:

a. Complete listing of all keys (AA1, AA2, etc.).

b. Complete listing of all key cuts (AA1-123456, AA2-123458).

c. Tabulation showing which key fits which door.

d. Copy of floor plan showing doors and door numbers.

e. Listing of 20 percent more key cuts than are presently required in each master system.

SD-07 Certificates

Hardware and Accessories; G, AE.

The hardware manufacturer's certificates of compliance stating that the supplied material or hardware item meets specified requirements. Each certificate shall be signed by an official authorized to certify in behalf of the product manufacturer and shall identify quantity and date or dates of shipment or delivery to which the certificates apply. A statement that the proposed hardware items appear in BHMA Certified Products Directory.

1.3 PREDELIVERY CONFERENCE

Upon approval of the Hardware Schedule, the construction Contractor shall arrange a conference with the hardware supplier, Contracting Officer and the using agency to determine keying system requirements. Location of the key control storage system, set-up and key identification labeling will also be determined.

1.4 DELIVERY, STORAGE, AND HANDLING

Hardware shall be delivered to the project site in the manufacturer's

original packages. Each article of hardware shall be individually packaged in the manufacturer's standard commercial carton or container, and shall be properly marked or labeled to be readily identifiable with the approved hardware schedule. Each change key shall be tagged or otherwise identified with the door for which its cylinder is intended. Where double cylinder functions are used or where it is not obvious which is the key side of a door, appropriate instructions shall be included with the lock and on the hardware schedule. Manufacturer's printed installation instructions, fasteners, and special tools shall be included in each package.

1.5 SPECIAL TOOLS

Special tools, such as those supplied by the manufacturer, unique wrenches, and dogging keys, shall be provided as required to adjust hardware items.

1.6 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a one year period shall be provided.

1.7 OPERATION AND MAINTENANCE MANUALS

Six complete copies of maintenance instructions listing routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guides shall be provided. The instructions for power-assisted handicapped door operators shall include simplified diagrams as installed.

PART 2 PRODUCTS

2.1 GENERAL HARDWARE REQUIREMENTS

Hardware shall conform to the requirements specified herein and the HARDWARE SETS listing at the end of this section. Hardware set numbers correspond to the set numbers shown on the drawings.

2.2 TEMPLATES

Requirements for hardware to be mounted on metal doors or metal frames shall be coordinated between hardware manufacturer and door or frame manufacturer by use of templates and other information to establish location, reinforcement required, size of holes, and similar details. Templates of hinges shall conform to BHMA A156.7.

2.3 HINGES

Hinges shall conform to BHMA A156.1. Hinges used on metal doors and frames shall also conform to BHMA A156.7. Except as otherwise specified, hinge sizes shall conform to the hinge manufacturer's printed recommendations.

2.3.1 Hinges for Reverse Bevel Doors with Locks

Hinges for reverse bevel doors with locks shall have pins that are made nonremovable by means such as a set screw in the barrel, or safety stud, when the door is in the closed position.

2.3.2 Contractor's Option

Hinges with antifriction bearings may be furnished in lieu of ball bearing hinges, except where prohibited for fire doors by the requirements of NFPA

80.

2.4 LOCKS AND LATCHES

To the maximum extent possible, locksets, latchsets and deadlocks, and all components thereof, including cylinders and removable cores, shall be the products of a single manufacturer.

2.4.1 Mortise Lock and Latchsets

Mortise lock, latchsets, and strikes shall be series 1000 and shall conform to BHMA A156.13, operational Grade 1. Mortise type locks and latches for doors 1-3/4 inches thick and over shall have adjustable bevel fronts or otherwise conform to the shape of the door. Mortise locks shall have armored fronts. All parts of mortise lock (i.e., strike, latchbolt) shall match finish of knob or lever.

Locksets and latchsets shall be capable of accepting "BEST" removable cores. Other hardware manufacturers ("FALCON") have recently successfully demonstrated full capabilities of providing totally and completely interchangeable cores (round top/unslotted) including pins, springs, etc., with Buckley AFB's existing "BEST" system and can provide locksets and latchsets which accept same.

2.4.2 Auxiliary Locks and Associated Products

Mortise dead locks and exit locks shall conform to BHMA A156.5. Strike boxes shall be furnished with dead bolt and latch strikes for Grade 1.

2.4.3 Lock Cylinders

Lock cylinders shall comply with BHMA A156.5. Lock cylinder shall have not less than seven pins. Cylinders shall have key removable type cores. Disassembly of knob or lockset shall not be required to remove core from lockset. All locksets, lockable exit devices, walk-in cooler and freezer door locks, and padlocks shall be provided with and shall accept same interchangeable cores.

2.4.4 Lock Trim

Lock trim shall be cast, forged, or heavy wrought construction of commercial plain design. In addition to meeting the test requirement of BHMA A156.13, knobs, lever handles, roses, and escutcheons shall be 0.050 inch thick, if unreinforced. If reinforced, the outer shell shall be 0.035 inch thick and the combined thickness shall be 0.070 inch except that knob shanks shall be 0.060 inch thick. Knob diameter shall be 2-1/8 to 2-1/4 inches. Lever handles shall be of plain design with ends returned to no more than 1/2 inch from the door face. Provide lever handles unless knobs are indicated in hardware set.

2.5 EXIT DEVICES AND EXIT DEVICE ACCESSORIES

Exit devices and exit device accessories shall conform to BHMA A156.3, Grade 1.

2.5.1 Exit Devices and Auxiliary Items

Trim shall be of wrought construction and commercial plain design with straight, beveled, or smoothly rounded sides, corners, and edges.

Adjustable strikes shall be provided for rim type and vertical rod devices. Open back strikes shall be provided for pairs of doors with mortise and vertical rod devices; except open back strikes shall be used on labeled doors only where specifically provided for in the published listings. Touch bars shall be provided in lieu of conventional crossbars and arms. Escutcheons shall be provided not less than 7 by 2-1/4 inches. Escutcheons shall be cut to suit cylinders and operating trim. Exterior trim with knob, roses and escutcheons shall be provided.

2.5.1.1 Required Custom Fabricated Exit Devices

Exit devices from child activity rooms to the exterior shall be provided with full-width push bar panic hardware. The contact or pressing surface shall extend the full width of the door. This is to prevent snagging of evacuation cribs on protruding edges and mechanisms. Currently available exit devices may require custom modification to meet this requirement at no extra cost to the Government. Shop drawings shall be submitted to ensure compliance.

2.5.2 Door Coordinator

Door coordinator with carry bar shall be Type 21 and shall be provided for each pair of doors equipped with an overlapping astragal. The coordinator shall be mechanically operated and shall be capable of holding the active door of a pair open until the inactive door has preceded it in the closing cycle.

2.5.3 Automatic Flush Bolts

Automatic flush bolts shall be Type 25 in accordance with BHMA A156.3, and shall be installed at the top and bottom of the inactive leaf of pairs of fire rated doors where specified in the hardware sets. Flush bolts shall be mortised in the strike edge of the door.

2.6 KEYING

Lock cores shall be removable type, keyed in sets or subsets as scheduled. Locks shall be furnished with the manufacturer's standard construction key system.

Keys for locks shall be stamped with change number and the inscription "U.S. Property - Do Not Duplicate." Use a "K" or "L" type keyway. Keys shall be supplied as follows:

Locks:	2 change keys each lock.
Master keyed sets:	6 keys each set.
Gandmaster key:	6 each
Construction keys:	6 total.
A3 Key Kit:	1 kit for each 100 locksets or fraction thereof.

The keys shall be furnished to the Contracting Officer arranged in a container specifically designed for key control system storage in sets or subsets as scheduled.

2.7 DOOR CLOSING DEVICES

Door closing devices shall conform to BHMA A156.4, Grade 1. Closing devices shall be products of one manufacturer for each type specified. The

opening resistance of closing devices shall not exceed 15 1bf applied at the latch stile 5 1bf for exterior doors and 22 N for interior doors.

2.7.1 Surface Type Closers

Surface type closers shall be Grade 1, Series C02000 Standard Cover with options PT-4H, Size 1 or 2 through Size 6, and PT-4D with back check position valve. Except as otherwise specified, sizes shall conform to the manufacturer's published recommendations. Closers for outswinging exterior doors shall have parallel arms or shall be top jamb mounted. Closers for doors close to a wall shall be of narrow projection so as not to strike the wall at the 90-degree open position.

2.8 DOOR CONTROLS - OVERHEAD HOLDERS AND STOPS

Door controls - overhead holders and stops shall conform to BHMA A156.8.

2.9 POWER ASSIST AND LOW ENERGY POWER OPERATORS

Power assist and low energy power operators shall conform to BHMA A156.19 and shall be electrically operated.

2.10 ARCHITECTURAL DOOR TRIM

Architectural door trim shall conform to BHMA A156.6.

2.10.1 Door Protection Plates

2.10.1.1 Armor Plates

Armor plates shall be Type J101 stainless steel, 36 inches in height, and 2 inches less in width than the width of the door for single doors and 1 inch less for pairs of doors. Edges of metal plates shall be beveled.

2.10.1.2 Kick Plates

Kick plates shall be Type J102 stainless steel. Width of plates shall be 2 inches less than door width for single doors and 1 inch less for pairs of doors. Height shall be 10 inches, except where the bottom rail is less than 10 inches the plate shall extend to within 1/2 inch of the panel mold or glass bead. Edges of metal plates shall be beveled.

2.10.1.3 Mop Plates

Mop plates shall be Type J103 stainless steel. Width of plates shall be 2 inches less than door width for single doors and 1 inch less for pairs of doors. The height shall be 4 inches. Edges of metal plates shall be beveled.

2.10.2 Push Plates

2.10.2.1 Combination Push-Pull Plates

Combination push-pull plates shall be Type J303, 0.050 inch thick minimum stainless steel beveled four edges.

2.10.2.2 Flat Plates

Flat plates shall be Type J301 0.50 inch thick stainless steel. Edges of metal plates shall be beveled.

2.10.3 Door Pulls and Push/Pull Units

2.10.3.1 Door Pulls

Door pulls shall be Category J400 stainless steel of plain modern design.

2.10.4 Push Bars

Push bars shall be Category J500, stainless steel. Edges of mounting plates shall be beveled.

2.11 AUXILIARY HARDWARE

Auxiliary hardware, consisting of door stops, shall conform to BHMA A156.16. Lever extension flush bolts shall be Type L14081. Dust-proof strikes shall be Type L04011.

2.12 MISCELLANEOUS

2.12.1 Automatic Door Bottoms

Automatic door bottoms shall be mortised type with aluminum housing cover, anodized clear finish. Door bottom shall have a wool, felt, rubber, vinyl, or neoprene seal and shall be actuated by the opening and closing of the door. The door bottom shall exclude light when the door is in the closed position and shall inhibit the flow of air through the unit.

2.12.2 Metal Thresholds

Thresholds shall conform to BHMA A156.21. Thresholds for exterior doors shall be extruded aluminum of the type indicated and shall provide proper clearance and an effective seal with specified weather stripping. Where required, thresholds shall be modified to receive projecting bolts of flush bolts and exit devices.Thresholds for doors accessible to the handicapped shall be beveled with slopes not exceeding 1:2 and with heights not exceeding 1/2 inch. Air leakage rate of weatherstripping shall not exceed 0.5 cubic feet per minute per lineal foot of crack when tested in accordance with ASTM E 283 at standard test conditions.

2.12.3 Rain Drips

Extruded aluminum, not less than 0.07 inch thick, bronze anodized. Door sill rain drips shall be 1-1/2 inches to 1-3/4 inches high by 5/8 inch projection. Overhead rain drips shall be approximately 1-1/2 inches high by 2-1/2 inches projection and shall extend 2 inches on either side of the door opening width.

2.12.4 Aluminum Housed Type Weatherseals

Weatherseals of the type indicated shall consist of extruded aluminum retainers not less than 0.07 inch wall thickness with vinyl, neoprene, silicone rubber, polyurethane or vinyl brush inserts. Aluminum shall be bronze anodized. Weatherseal material shall be of an industrial/commercial grade. Seals shall remain functional through all weather and temperature conditions. Air leakage rate of weatherstripping shall not exceed 0.5 cubic feet per minute per lineal foot of crack when tested in accordance with ASTM E 283 at standard test conditions.

2.12.5 Gasketing

Gasketing shall conform to BHMA A156.22 and shall be a compression type seal, silicon based, self-adhesive product for use on steel door frames with wood or steel doors for 45 minute C-label. Color shall be bronze. Air leakage rate of weatherstripping shall not exceed 0.5 cubic feet per minute per lineal foot of crack when tested in accordance with ASTM E 283 at standard test conditions.

2.12.6 Key Control Storage System

Key control storage system shall conform to BHMA A156.5, Type E8341, capacity 125, and shall be properly labeled for key identification. Set up, identification labeling and location of the key control storage shall be as directed at the Predelivery Conference.

2.12.7 Door Stops

Wall stops, floor stops and combination stop and holders shall conform to BHMA A156.16. In all cases, wall stops shall be secured to blocking or backing, such as metal stud, behind gypsum board.

2.13 FASTENINGS

Fastenings of proper type, size, quantity, and finish shall be supplied with each article of hardware. Machine screws and expansion shields shall be used for attaching hardware to concrete or masonry. Fastenings exposed to the weather in the finished work shall be of brass, bronze, or stainless steel. Sex bolts, through bolts, or machine screws and grommet nuts, where used on reverse-bevel exterior doors equipped with half-surface or full-surface hinges, shall employ one-way screws or other approved tamperproof screws. Screws for the jamb leaf of half-mortise and full-surface hinges attached to structural steel frames shall be one-way or other approved tamperproof type.

2.14 FINISHES

Unless otherwise specified, finishes shall conform to those identified in BHMA A156.18. Where painting of primed surfaces is required, painting is specified in Section 09900 PAINTING, GENERAL.

2.15 HARDWARE FOR FIRE DOORS

Hardware for fire doors shall conform to the requirements of NFPA 80 and NFPA 101.

PART 3 EXECUTION

3.1 APPLICATION

Hardware shall be located in accordance with DHI Locations for CSD and DHI Locations for SSD, except that deadlocks shall be mounted 48 inchesabove finish floor. When approved, slight variations in locations or dimensions will be permitted. Application shall be in accordance with DHI ANSI/DHI A115.1G or DHI ANSI/DHI A115-W. Door control devices for exterior doors such as closers and holders, shall be attached to doors with thru bolts and nuts or sex bolts. Alternate fastening methods may be approved by the Contracting Officer when manufacturers' documentation is submitted to verify that the fastening devices and door reinforcements are adequate to

resist wind induced stresses. Electric hardware items shall be installed in accordance with manufacturer's printed installation procedures.

3.1.1 Hardware for Fire Doors and Smoke-Control Door Assemblies

Hardware for fire doors shall be installed in accordance with the requirements of NFPA 80. Exit devices installed on fire doors shall have a visible label bearing the marking "Fire Exit Hardware". Other hardware installed on fire doors, such as locksets, closers, and hinges shall have a visible label or stamp indicating that the hardware items have been approved by an approved testing agency for installation on fire-rated doors. Hardware for smoke-control door assemblies shall be installed in accordance with NFPA 105.

3.1.2 Door-Closing Devices

Door-closing devices shall be installed and adjusted in accordance with the templates and printed instructions supplied by the manufacturer of the devices. Insofar as practicable, doors opening to or from halls and corridors shall have the closer mounted on the room side of the door.

3.1.3 Key Control Storage Systems

Key control storage system shall be installed where directed.

3.1.4 Kick Plates and Mop Plates

Kick plates shall be installed on the push side of single-acting doors and on both sides of double-acting doors. Mop plates shall be installed on the pull side of the single acting doors.

3.1.5 Auxiliary Hardware

Lever extension flush bolts shall be installed at the top and bottom of the inactive leaf of pairs of doors. The bottom bolt shall operate into a dust-proof floor strike or threshold.

3.1.6 Thresholds

Thresholds shall be secured with a minimum of three fasteners per single door width and six fasteners per double door width with a maximum spacing of 12 inches. Exterior thresholds shall be installed in a bed of sealant with expansion anchors and stainless steel screws. Minimum screw size shall be No. 10 length, dependent on job conditions, with a minimum of 3/4 inch thread engagement into the floor or anchoring device used.

3.1.7 Rain Drips

Door sill rain drips shall align with the bottom edge of the door. Overhead rain drips shall align with bottom edge of door frame rabbet. Drips shall be set in sealant and fastened with stainless steel screws.

3.1.8 Weatherseals

Weatherseals shall be located as indicated, snug to door face and fastened in place with color matched metal screws after door and frames have been finish painted. Screw spacing shall be as recommended by manufacturer.

3.1.9 Gasketing

Gasketing shall be installed at the inside edge of the hinge and head and latch sides of door frame. Frames shall be toleranced for a 1/8 inch clearance between door and frame. Frames shall be treated with tape primer prior to installation.

3.2 OPERATIONAL TESTS

Prior to acceptance of any electrical hardware system, an operational test shall be performed to determine if devices are operating as intended by the specifications. Wiring shall be tested for correct voltage, current carrying capacity, and proper grounding.

3.3 FIELD QUALITY CONTROL

Architectural Hardware Consultant shall inspect the completed installation and certify that the hardware has been furnished and installed in accordance with the manufacturers' instructions and as specified. The inspection report shall identify any malfunctioning items and recommend adjustment or replacement as appropriate.

3.4 HARDWARE SETS

HW-1 Pair of Doors 101A

2 sets	Offset Pivots, C07172 x 3/4-inch Offset or as required by Aluminum Door and Frame Supplier x 710
1 ea.	Offset Intermediate Pivot, C07321 x 3/4-inch Offset or as required by Aluminum Door and Frame Supplier x 710
1 ea.	Electric Offset Intermediate Pivot, C07321 x 3/4-inch Offset or as required by Aluminum Door and Frame Supplier x 4 electric through wires x 710 4 ea. Finger Protection, MK1A and MK1B, Fingersafe, USA or approved equal x door height less 6 inches, black color
1 ea.	Key Switch to activate or deactivate the exterior power operator push button; mount at building interior on wall adjacent to door sidelight. Key to match exit device keying.
1 ea.	Exit Device, Type 5 x Narrow Stile Push Pad Type, Function 08 - Grade 1 x Exterior Lever Handles x Interior Cylinder Dogging x 613
1 ea.	Electric Exit Device, Type 5 x Narrow Stile Push Pad Type, Function 08 - Grade 1 x 24VDC x Exterior Lever Handles x Interior Cylinder Dogging x 613
4 ea.	Cylinders as required x 613
1 ea.	Power Supply and controls for electric panic device, 120VAC x 24VDC; mount above ceiling in Entry 101.
2 ea.	Dust Proof Strikes, L54021 x 613
1 ea.	Closer, C02021 x PT-4C x Low Opening Resistance x Spring-Cushioned Stop Arm x 690
1 ea.	Low Energy Power Operator, 120 VAC x 710; power operator shall operate simultaneously with the operator scheduled in HW-2.
2 ea.	Power Operator Frame Switches x 24VDC, with international accessibility symbol (provided with low energy power operator)
2 ea.	"ACTIVATE SWITCH TO OPERATE" signs with white letters on blue background, in compliance with BHMA A156.19. Install on the sidelight adjacent to the door.
2 ea.	Kick Plates, J102 x 630
1 ea.	Overhead Concealed Stop, C01541 x 630
1 ea.	Threshold, J12130 x 6 inches wide x 1/4 high x 613
1 set	Weather Seals at head, jambs, meeting stiles and sill by door

supplier.

When the electric exit device vertical rods are in released position and lock bolts are extended (after hours operation) and the interior door operator push button is depressed, the electric exit device controls shall cause the electric exit device on the door with the power operator to retract the bolts. There shall then be a short time delay before activation of the door operators (HW-1 and HW-2) to prevent the operator from opening against the lock bolts.

If the exterior power operator push button is depressed while the exit device vertical rods are released and lock bolts are extended (after hours operation), no signal shall be received by the exit device controls. This shall be accomplished by deactivation of the exterior power operator push button with the key switch.

Provide required electrical power to the electric exit device power supply and power operator, and conduit and wiring in the storefront to the electric pivot. Provide final wiring and terminations.

Submit complete product data and shop drawing/wiring schematics for review.

HW-2 Pair of Doors 101B

2 sets Offset Pivots, C07172 x 3/4-inch Offset or as required by Aluminum Door and Frame Supplier x 710
2 ea. Offset Intermediate Pivots, C07321 x 3/4-inch Offset or as required by Aluminum Door and Frame Supplier x 710
4 ea. Finger Protection, MK1A and MK1B, Fingersafe, USA or approved equal x door height less 6 inches, black color
2 ea. Push Bars, J501 x 1-inch diameter x 613
1 ea. Closer, C02011 x PT-4C x Low Opening Resistance x 690
1 ea. Low Energy Power Operator, 120 VAC x 710; mount on Entry 101 side of door. Power operator shall operate simultaneously with the operator scheduled in HW-1.
1 ea. Power Operator Frame Switch x 24VDC, with international accessibility symbol (provided with low energy power operator)
1 ea. "ACTIVATE SWITCH TO OPERATE" sign with white letters on blue background, in compliance with BHMA A156.19. Install on the sidelight adjacent to the door.
1 ea. Overhead Concealed Stop, C01541 x 613

Provide required electrical power to the power operator and conduit and wiring in the storefront to the electric pivot. Provide final wiring and terminations.

Submit complete product data and shop drawing/wiring schematics for review.

HW-3 Door 110A

1 set Offset Pivots, C07172 x 3/4-inch Offset or as required by Aluminum Door and Frame Supplier x 710
1 ea. Offset Intermediate Pivot, C07321 x 3/4-inch Offset or as required by Aluminum Door and Frame Supplier x 710
2 ea. Finger Protection, MK1A and MK1B, Fingersafe, USA or approved equal x door height less 6 inches, black color
1 ea. Exit Device, Type 5 x Narrow Stile Push Pad Type, Function 08 - Grade 1 x Exterior Lever Handles x 613
1 ea. Closer, C02021 x PT-4C x Spring Cushioned Stop Arm x Low Opening

Resistance x 690 (For Base Bid Only)
1 ea. Closer, C02021 x PT-4C x Low Opening Resistance x 690 (For Bid Option 1 Only)
1 ea. Wall Stop, L52101 x 2-1/2-inches diameter x 630 with lag bolt (For Bid Option 1 Only)
1 ea. Threshold, J12130 x 6 inches wide x 1/4 high x 613
1 set Weather Seals at head, jambs and sill by door supplier.
1 ea. Balanced Magnetic Switch (BMS), see Electrical for details.

HW-4 Doors 103A, 106A, and 132A

1 1/2 pr. Hinges, A5111 x 630
1 set Finger Protection, MK1A and MK1B, Fingersafe, USA or approved equal x door height less 6 inches, black color
1 ea. Mortise Lockset, F04 - Grade 1 x 630
1 ea. Kick Plate, J102 x 630
1 ea. Wall Stop, L52101 x 2 1/2 inches diameter x 630 with lag bolt
1 set Sound seals at head and jambs, R0E155 x black or bronze
1 ea. Automatic Door Bottom, R3D325

HW-5 Doors 109A, 113A, 114A

1 1/2 pr. Hinges, A5111 x 630
1 set Finger Protection, MK1A and MK1B, Fingersafe, USA or approved equal x door height less 6 inches, black color
1 ea. Mortise Lockset, F02 x Knobs - Grade 1 x 630
1 ea. Closer, C02011 x 689
1 ea. Kick Plate, J102 x 630
1 ea. Wall Stop, L52101 x 2 1/2 inches diameter x 630 with lag bolt

HW-6 Fire Rated Doors 116A and 135A

1 1/2 pr. Hinges, A5111 x 630
1 ea. Mortise Lockset, F07 - Grade 1 x 630
1 ea. Kick Plates, J102 x 630
1 ea. Closer, C02011 x 689
1 ea. Wall Stop, L52101 x 2-1/2-inches diameter x 630 with lag bolt
1 set Smoke Seals at head and jambs, R0E154 x black or bronze

HW-7 Pair of Doors 152A

3 pr. Hinges, A5111 x NRP x 630
1 ea. Mortise Lockset, F07 - Grade 1 x 630 (interior) and and 613 (exterior)
1 pr. Manual Flush Bolts, L04081 x 630
1 ea. Dust Proof Strike, L54021 x 630
2 ea. Closers, C02021 x PT-4C x 689
2 ea. Overhead Concealed Stops, C01541 x 630
1 ea. Coordinator, Type 21 x 600
2 ea. Kick Plates, J102 x 630
1 set Weather Seals at head and jambs
1 ea. Astragal, R3E615 x 710
1 ea. Threshold J36130 x 5 inches wide x 1/2 inch high total x 628
2 ea. Door Sill Rain Drips x 710

HW-8 Door 115A

1 1/2 pr. Hinges, A5111 x 630

1 set Finger Protection, MK1A and MK1B, Fingersafe, USA or approved equal x door height less 152 mm, black color
1 ea. Mortise Lockset, F02 - Grade 1 x 630
1 ea. Closer, C02011 x 689
1 ea. Kick Plate, J102 x 630
1 ea. Wall Stop, L52101 x 2 1/2 inches diameter x 630 with lag bolt

HW-9 Doors 118A, 119A, 120A, 122A, 136A, 137A, 138A, 139A, 140A, and 141A; Bid Option 1 Doors 123A and 124A; Bid Option 2 Door 142A

1 1/2 pr. Hinges, A5111 x NRP x 630
1 set Finger Protection, MK1A and MK1B, Fingersafe, USA or approved equal x door height less 6 inches, black color
1 ea. Exit Device (Panic), Type 1, Low Profile Push Pad Type, Function 08 - Grade 1 x Exterior Lever Handle x 630 (interior) and 613 (exterior). (Exit device shall have no component with protruding or overhanging edges or ends which can catch or hook carts, clothing or other items passing through opening)
1 ea. Closer, C02021 x 689
1 ea. Kick Plate, J102 x 630
1 ea. Overhead Concealed Holder/Stop, C01511 x 630
1 set Weather Seals at head and jambs
1 ea. Threshold, J32130 x 6 inches wide x 1/4 inch high x 628
1 ea. Door Shoe with Drip Cap, R3E535 x 710

HW-10 Doors 118B, 119B, 120B, 122B, 136B, 137B, 138B, 139B, 140B and 141B; Bid Option 1 Doors 123B and 124B; Bid Option 2 Door 142B

1 1/2 pr. Hinges, A5111 x 630
1 set Finger Protection, MK1A and MK1B, Fingersafe, USA or approved equal x door height less 6 inches, black color
1 ea. Mortise Latchset, F01 - Grade 1 x 630
1 ea. Closer, C02021 x 689
1 ea. Kick Plate, J102 x 630
1 ea. Wall Stop, L52101 x 2 1/2 inches diameter x 630 with lag bolt

HW-11 "Half-Height" Doors 118AA, 118BA, 119AA, 119BA, 120AA, 120BA, 122AA, 122BA, 137AA, 137BA, 139AA, 139BA, 141AA and 141BA; Bid Opion 1 Doors 123AA, 123BA and 124BA

1 pr. Hinges, A5111 x 630
1 set Finger Protection, MK1A and MK1B, Fingersafe, USA or approved equal x door height, black color
1 ea. Mortise Latchset, F01 - Grade 1 x 630; custom with lever handle on inside only, no trim outside
1 ea. Wall Stop, L52101 x 2 1/2 inches diamter x 630; mounted on door where door contacts sink

HW-12 Doors 118CA, 119CA, 120CA, 122CA, 136AB, 137CA, 138AB, 139CA, 140AB and 141CA; Bid Option 1 Doors 123CA, 124AA; Bid Option 2 Door 142AA

1 1/2 pr. Hinges, A5111 x 630
1 set Finger Protection, MK1A and MK1B, Fingersafe, USA or approved equal x door height less 6 inches, black color
1 ea. Mortise Lockset, F07 - Grade 1 x 630
1 ea. Kick Plate, J102 x 630
1 ea. Wall Stop, L52101 x 2 1/2 inches diameter x 630 with lag bolt

HW-13 Door 121A

1 pr. Hinges, A5111 x NRP x 630
1/2 pr. Electric Hinge, A5111 x NRP x 4 electric through wires x 630
1 ea. Exit Lock with Alarm, E0431 x latch bolt x surface strike x full width actuating bar x exterior knob x 9 VDC x 630 (interior) and 613 (exterior)
1 ea. Power Supply for Alarm; 120VAC x 9VDC; mount above ceiling.
1 ea. Closer, C02021 x PT-4C x Spring Cushioned Stop Arm x 689
1 set Weather Seals at head and jambs
1 ea. Threshold, J36130 x 5-inches wide x 1/2-inch maximum height x 628
1 ea. Door Sill Rain Drip x 710

HW-14 Pair of Doors 112A

3 pr. Hinges, A5111 x NRP x 630
2 ea. Exit Devices, Type 6 x Narrow Stile Push Pad Type, Function 08 - Grade 1 x Lever Handle x 630 (interior) and 613 (exterior)
2 ea. Dust Proof Strikes, L04011 x 630
2 ea. Closers, C02021 x PT-4C x Low Opening Resistance x Spring Cushioned Stop Arm x 689
2 ea. Kick Plates, J102 x 630
1 set Weather Seals at head and jambs
2 ea. Adjustable Astragals, R3E835 x 710
1 ea. Threshold, J16130 x 5-inches wide x 1/2-inch maximum height x 613
2 ea. Door Sill Rain Drips x 710

HW-15 Door 150A

1 1/2 pr. Hinges, A5111 x 630
1 ea. Mortise Lockset, F07 - grade 1 x 630 (interior) and 613 (exterior)
1 ea. Closer, C02021 x PT-4C x Spring Cushioned Stop Arm x 689
1 ea. Kick Plate, J102 x 630
1 ea. Threshold J36130 x 5 inches wide x 1/2 inch high total x 628
1 ea. Door Sill Rain Drip x 710

HW-16 Fire Rated Door 117A

1 1/2 pr. Hinges, A5111 x 630
1 set Finger Protection, MK1A and MK1B, Fingersafe, USA or approved equal x door height less 6 inches, black color
1 ea. Mortise Lockset, F05 - Grade 1 x 630
1 ea. Closer, C02011 x 689
1 ea. Wall Stop, L52101 x 2 1/2 inch diameter x 630 with lag bolt
1 ea. Kick Plate, J102 x 630
1 set Smoke seals at head and jambs, R0E154 x black or bronze

HW-18 Doors 108A, 133A, 134A

1 1/2 pr. Hinges, A5111 x 630
1 set Finger Protection, MK1A and MK1B, Fingersafe, USA or approved equal x door height less 6 inches, black color
1 ea. Mortise Lockset, F05 - Grade 1 x 630
1 ea. Kick Plate, J102 x 630
1 ea. Wall Stop, L52101 x 2 1/2 inches diameter x 630 with lag bolt

HW-19 Door 121BA

1 1/2 pr. Hinges, A5111 x 630

1 set Finger Protection, MK1A and MK1B, Fingersafe, USA or approved equal x door height less 6 inches, black color
1 ea. Mortise Lockset, F07 - Grade 1 x 630
1 ea. Armor Plate, J101 x 630
1 ea. Wall Stop, L52101 x 2 1/2 inches diameter x 630 with lag bolt

HW-20 Door 111A, 112B and 121AA

1 1/2 pr. Hinges, A5111 x 630
1 ea. Mortise Lockset, F04 - Grade 1 x 630
1 ea. Kick Plate, J102 x 630
1 ea. Wall Stop, L52101 x 2 1/2 inches diameter x 630 with lag bolt

HW-21 Fire Rated Door 121B

1 1/2 pr. Hinges, A5111 x 630
2 ea. Finger Protection, MK1A or MK1B, Fingersafe, USA or approved equal x door height less 6 inches, black color
1 ea. Mortise Lockset, F05 - Grade 1 x 630
1 ea. Closer, C02011 x 689
1 ea. Armor Plate, J101 x 630
1 ea. Wall Stop, L52101 x 2 1/2 inches diameter x 630 with lag bolt
1 ea. Electro Magnetic Holder, C00011 x 24VDC x 630

HW-22 Door 130A

1 set Offset Pivots, C07172 x 3/4-inch Offset or as required by Aluminum Door and Frame Supplier x 710
1 ea. Offset Intermediate Pivot, C07321 x 3/4-inch Offset or as required by Aluminum Door and Frame Supplier x 710
2 ea. Finger Protection, MK1A and MK1B, Fingersafe, USA or approved equal x door height less 6 inches, black color
1 ea. Exit Device, Type 5 x Narrow Stile Push Pad Type, Function 08 - Grade 1 x Exterior Lever Handles x 613
1 ea. Closer, C02021 x PT-4C x Low Opening Resistance x 690
1 ea. Wall Stop, L52101 x 2-1/2-inches diameter x 630 with lag bolt
1 ea. Threshold, J12130 x 6 inches wide x 1/4 high x 613
1 set Weather Seals at head, jambs and sill by door supplier.
1 ea. Balanced Magnetic Switch (BMS), see Electrical for details.

HW-23 Door 151A

1 1/2 pr. Hinges, A5111 x 630
1 ea. Exit Device, Type 3 x Mortise Grade 1 x 630 (interior) and 613 (exterior)
1 ea. Closer, C02021 x PT-4C x Spring Cushioned Stop Arm x 689
1 ea. Kick Plate, J102 x 630
1 ea. Threshold J36130 x 5 inches wide x 1/2 inch high total x 628
1 ea. Door Sill Rain Drip x 710

3.4.1 KEYING SCHEDULE

A - Grandmaster Key
AA1 - Building Entrances:
Doors 101A, 101B, 110A, 130A
AA2 - Classroom Entrances and Storage:
Doors 118B, 118CA, 119B, 119CA, 120B, 120CA, 122B, 122CA,

136B, 136AB, 137B, 137CA, 138B, 138AB, 139B, 139CA, 140B, 140AB, 141B, 141CA; Bid Option 1 Doors 123B, 123CA, 124B, 124AA; Bid Option 2 Doors 142B, 142AA

AA3 - General Storage Entrance:
Door 135A

AA4 - Toddler Care Room Exterior Entrances:
Doors 119A, 120A, 122A; Bid Option 1 Door 123A

AA5 - Pre-Toddler Care Room Exterior Entrances:
Doors 136A, 138A, 140A; Bid Option 2 Door 142A

AA6 - Preschool Care Room Exterior Entrances:
Doors 137A, 139A, 141A

AB Care Giver's Master Key:
All doors keyed with AA Designations

AB1 - Workroom:
Door 108A

AB2 - Director's Office:
Door 106A

AB3 - Assistant Director's Office:
Door 103A

AB4 - Training Office:
Door 132A

AB5 - Training:
Door 133A

AB6 - Breakroom:
Door 134A

AB7 - Laundry and Janitor:
Doors 116A, 117A

AC - Kitchen Master Key:

AC1 - Kitchen:
Door 121B

AC2 - Dry Stores:
Door 121BA

AC3 - Kitchen Office:
Door 121AA

AC4 - Cooler/Freezer:
Un-numbered two doors

AC5 - Exterior Kitchen Access:
Door 121A

AD - Family Care Master Key:

AD1 - Family Care Office:
Door 111A

AD2 - Lending Library:
Door 112B

AD3 - Exterior Lending Library
Door 112A

B - Base Mechanical Master Key

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Doors 150A, 151A, 152A

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10/03

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SECTION 08800

GLAZING
10/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z97.1	(1984; R 1994) Safety Glazing Materials Used in Buildings

ASTM INTERNATIONAL (ASTM)

ASTM C 509	(2000) Elastomeric Cellular Preformed Gasket and Sealing Material
ASTM C 864	(1999) Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers
ASTM C 1036	(2001) Flat Glass
ASTM C 1048	(1997; Rev. B) Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass
ASTM C 1184	(2000ae1) Structural Silicone Sealants
ASTM D 395	(2001) Rubber Property - Compression Set
ASTM E 119	(2000a) Fire Tests of Building Construction and Materials
ASTM E 773	(2001) Accelerated Weathering of Sealed Insulating Glass Units
ASTM E 774	(1997) Classification of the Durability of Sealed Insulating Glass Units
ASTM E 1300	(2000) Determining Load Resistance of Glass in Buildings

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

16 CFR 1201	Architectural Glazing Materials

GLASS ASSOCIATION OF NORTH AMERICA (GANA)

GANA Glazing Manual	(1997) Glazing Manual
GANA Sealant Manual	(1990) Sealant Manual

GANA Standards Manual	(2001) Tempering Division's Engineering Standards Manual

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 80	(1999) Fire Doors and Fire Windows

THE INSULATING GLASS MANUFACTURERS ALLIANCE (IGMA)

SIGMA A1202	(1983) Commercial Insulating Glass Dimensional Tolerances
SIGMA TM-3000	(1997) Glazing Guidelines for Sealed Insulating Glass Units
SIGMA TB-3001	(1990) Sloped Glazing

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Installation

Drawings showing complete details of the proposed setting methods, mullion details, edge blocking, size of openings, frame details, materials, and types and thickness of glass.

SD-03 Product Data

Insulating Glass; G, AE.

Fire Glass; G, AE.

Glazing Accessories

Manufacturer's descriptive product data, handling and storage recommendations, installation instructions, and cleaning instructions.

SD-04 Samples

Insulating Glass; G, AE.

Fire Glass; G, AE.

Two 8 x 10 inch samples of each of the following: Wire glass insulating glass units.

SD-07 Certificates

Insulating Glass.

Fire Glass; G, AE.

Certificates stating that the glass meets the specified requirements. Labels or manufacturers marking affixed to the glass will be accepted in lieu of certificates.

SD-08 Manufacturer's Instructions

Setting and sealing materials.

Glass setting

Submit glass manufacturer's recommendations for setting and sealing materials and for installation of each type of glazing material specified.

1.3 SYSTEM DESCRIPTION

Glazing systems shall be fabricated and installed watertight and airtight to withstand thermal movement and wind loading without glass breakage, gasket failure, deterioration of glazing accessories, and defects in the work. Glazed panels shall comply with the safety standards, as indicated in accordance with ANSI Z97.1. Glazed panels shall comply with indicated wind/snow loading in accordance with ASTM E 1300.

1.3.1 Required Tempered Glazing

All glazing in this facility shall be tempered. This includes both interior and exterior panes of insulating glass units, all glazing in interior and exterior doors, as well as all interior glazing.

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver products to the site in unopened containers, labeled plainly with manufacturers' names and brands. Store glass and setting materials in safe, enclosed dry locations and do not unpack until needed for installation. Handle and install materials in a manner that will protect them from damage.

1.5 ENVIRONMENTAL REQUIREMENTS

Do not start glazing work until the outdoor temperature is above 40 degrees F and rising, unless procedures recommended by the glass manufacturer and approved by the Contracting Officer are made to warm the glass and rabbet surfaces. Provide ventilation to prevent condensation of moisture on glazing work during installation. Do not perform glazing work during damp or rainy weather.

1.6 WARRANTY

1.6.1 Warranty for Insulating Glass Units

Warranty insulating glass units against development of material obstruction to vision (such as dust, fogging, or film formation on the inner glass surfaces) caused by failure of the hermetic seal, other than through glass breakage, for a 5-year period following acceptance of the work. Provide new units for any units failing to comply with terms of this warranty within 45 working days after receipt of notice from the Government.

PART 2 PRODUCTS

2.1 GLASS

ASTM C 1036, unless specified otherwise. In doors and sidelights, provide safety glazing material conforming to 16 CFR 1201.

2.1.1 Tempered Glass

ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated), Type I, Class 1 (transparent) and 2 (tinted heat absorbing), Quality q3, 1/4 inch thick conforming to ASTM C 1048 and GANA Standards Manual.

2.1.2 Patterned Class

Patterned glass shall be Type II flat type. Class 1 translucent, f1 patterned one side. Color shall be clear.

2.1.3 Fire/Safety Rated Glass

Fire/safety rated glass shall be laminated Type I transparent flat type, Class 1-clear. Glass shall have a 45 minute rating when tested in accordance with ASTM E 119. Glass shall be permanently labeled with appropriate markings.

2.2 INSULATING GLASS UNITS

Two panes of glass separated by a dehydrated airspace and hermetically sealed. Dimensional tolerances shall be as specified in SIGMA A1202. The units shall conform to ASTM E 773 and ASTM E 774, Class A. Spacer shall be roll-formed, with bent or tightly welded or keyed and sealed joints to completely seal the spacer periphery and eliminate moisture and hydrocarbon vapor transmission into airspace through the corners. Primary seal shall be compressed polyisobutylene and the secondary seal shall be a specially formulated silicone.

2.2.1 Low Emissivity Insulating Glass

Interior and exterior glass panes for Low-E insulating units shall be glass, Class 2-tinted with anti-reflective low-emissivity coating on No. 2 surface (inside surface of exterior pane), Quality q3 - glazing select, conforming to ASTM C 1036. Glass performance shall be U-Value/Winter Nighttime 0.47, shading coefficient 0.52. Glass shall be equal to (design basis) PPG Solargray.

2.2.1.1 Configuration For Low-E Insulating Glass

Configuration for low-E insulating glass units shall be as shown below, working inwards from the outboard pane. This glazing configuration shall apply to all exterior glass in the facility:

a. Outboard light 1/4 inch tempered and tinted with low-E coating (on #2 surface);
b. 1/2 inch airspace;
c. Inboard light 1/4 inch clear tempered.

2.3 SETTING AND SEALING MATERIALS

Provide as specified in the GANA Glazing Manual, SIGMA TM-3000, SIGMA

TB-3001, and manufacturer's recommendations, unless specified otherwise herein. Do not use metal sash putty, nonskinning compounds, nonresilient preformed sealers, or impregnated preformed gaskets. Materials exposed to view and unpainted shall be gray or neutral color.

2.3.1 Sealants

2.3.1.1 Silicone Structural Glazing Sealant

Silicon structural glazing sealant for exterior glazing ASTM C 1184 dow corning 995 or approved equal. Install as per manufacturer's instructions sealant bite shall be 3/8 inch to 1/2 inch.

2.3.2 Sealing Tapes

Preformed, semisolid, polymeric-based material of proper size and compressibility for the particular condition. Use only where glazing rabbet is designed for tape and tape is recommended by the glass or sealant manufacturer. Provide spacer shims for use with compressible tapes. Tapes shall be chemically compatible with the product being set.

2.3.3 Setting Blocks and Edge Blocks

Neoprene setting blocks shall be dense extruded type conforming to ASTM D 395, Method B, Shore A durometer between 70 and 90. Edge blocking shall be Shore A durometer of 50 (+ or - 5). Silicone setting blocks shall be required when blocks are in contact with silicone sealant. Profiles, lengths and locations shall be as required and recommended in writing by glass manufacturer.

2.3.4 Glazing Gaskets

Glazing gaskets shall be extruded with continuous integral locking projection designed to engage into metal glass holding members to provide a watertight seal during dynamic loading, building movements and thermal movements. Glazing gaskets for a single glazed opening shall be continuous one-piece units with factory-fabricated injection-molded corners free of flashing and burrs. Glazing gaskets shall be in lengths or units recommended by manufacturer to ensure against pull-back at corners. Glazing gasket profiles shall be as indicated on drawings.

2.3.4.1 Fixed Glazing Gaskets

Fixed glazing gaskets shall be closed-cell (sponge) smooth extruded compression gaskets of cured elastomeric virgin neoprene compounds conforming to ASTM C 509, Type 2, Option 1.

2.3.4.2 Wedge Glazing Gaskets

Wedge glazing gaskets shall be high-quality extrusions of cured elastomeric virgin neoprene compounds, ozone resistant, conforming to ASTM C 864, Option 1, Shore A durometer between 65 and 75.

2.3.4.3 Aluminum Framing Glazing Gaskets

Glazing gaskets for aluminum framing shall be permanent, elastic, non-shrinking, non-migrating, watertight and weathertight.

2.3.5 Accessories

Provide as required for a complete installation, including glazing points, clips, shims, angles, beads, and spacer strips. Provide noncorroding metal accessories. Provide primer-sealers and cleaners as recommended by the glass and sealant manufacturers.

PART 3 EXECUTION

3.1 PREPARATION

Preparation, unless otherwise specified or approved, shall conform to applicable recommendations in the GANA Glazing Manual, GANA Sealant Manual, SIGMA TB-3001, SIGMA TM-3000, and manufacturer's recommendations. Determine the sizes to provide the required edge clearances by measuring the actual opening to receive the glass. Grind smooth in the shop glass edges that will be exposed in finish work. Leave labels in place until the installation is approved, except remove applied labels on heat-absorbing glass and on insulating glass units as soon as glass is installed. Securely fix movable items or keep in a closed and locked position until glazing compound has thoroughly set.

3.2 GLASS SETTING

Shop glaze or field glaze items to be glazed using glass of the quality and thickness specified or indicated. Glazing, unless otherwise specified or approved, shall conform to applicable recommendations in the GANA Glazing Manual, GANA Sealant Manual, SIGMA TB-3001, SIGMA TM-3000, and manufacturer's recommendations. Aluminum windows, wood doors, and wood windows may be glazed in conformance with one of the glazing methods described in the standards under which they are produced, except that face puttying with no bedding will not be permitted. Handle and install glazing materials in accordance with manufacturer's instructions. Use beads or stops which are furnished with items to be glazed to secure the glass in place.

3.2.1 Sheet Glass

Cut and set with the visible lines or waves horizontal.

3.2.2 Insulating Glass Units

Do not grind, nip, or cut edges or corners of units after the units have left the factory. Springing, forcing, or twisting of units during setting will not be permitted. Handle units so as not to strike frames or other objects. Installation shall conform to applicable recommendations of SIGMA TB-3001 and SIGMA TM-3000.

3.2.3 Installation of Fire Stafety Glass

Install glass for fire doors in accordance with installation requirements of NFPA 80.

3.3 CLEANING

Clean glass surfaces and remove labels, paint spots, putty, and other defacement as required to prevent staining. Glass shall be clean at the time the work is accepted.

3.4 PROTECTION

Glass work shall be protected immediately after installation. Glazed openings shall be identified with suitable warning tapes, cloth or paper flags, attached with non-staining adhesives. Reflective glass shall be protected with a protective material to eliminate any contamination of the reflective coating. Protective material shall be placed far enough away from the coated glass to allow air to circulate to reduce heat buildup and moisture accumulation on the glass. Glass units which are broken, chipped, cracked, abraded, or otherwise damaged during construction activities shall be removed and replaced with new units.

3.5 GLAZING SCHEDULE

Location	Glass Type
Exterior:	
Main Level Windows	Low-E tinted insulating unit, 1 inch overall thickness, both panes tempered
Clerestory Windows	Low-E tinted insulating unit, 1 inch overall thickness, interior pane clear translucent, both panes tempered
Entrance Doors	Low-E tinted insulating unit, 1 inch overall thickness, both panes tempered
Storefront	Low-E tinted insulating unit, 1 inch overall thickness, both panes tempered
Interior:	
Door Glazing	Clear tempered pane, 1/4 inch thickness
Fire Door Glazing	Clear Tempered pane, 1/4 inch thickness
Storefront Doors	Clear tempered pane, 1/4 inch thickness
Storefront	Clear tempered pane, 1/4 inch thickness
Corridor Windows	Clear insulating unit, 1 inch overall thickness, panes tempered

Mullions:

See door and window details for between-pane mullions and pattern.

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DIVISION 08 - DOORS AND WINDOWS

SECTION 08950

INSULATED TRANSLUCENT WALL PANEL SYSTEM

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SECTION 08950

INSULATED TRANSLUCENT WALL PANEL SYSTEM

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E 108	(1996) Test Methods for Fire Tests of Roof Coverings.
ASTM D 1037	1985 (R1994) Practice for Inspection of Underground Pre-cast Concrete Utility Structures.

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7	(1998) Minimum Design Loads for Buildings and Other Structures

1.2 GENERAL REQUIREMENTS

Provide wall systems manufactured by a single firm specializing in the production of this type of work.

Drawings are based on one manufacturer's standard wall system. Another standard system of a similar and equivalent nature will be acceptable when differences do not detract from design concept or specified performances. Dimensional changes necessitated by the use of an alternative system shall be coordinated by the Contractor and shall be shown on shop drawings.

1.3 SYSTEM DESCRIPTION

Provide translucent wall system that complies with specified performance characteristics. Each system shall be tested by a recognized testing laboratory or agency in accordance with specified test methods. Provide certified test results.

1.3.1 Flammability

Panels shall pass a Class "A", Burning Brand Test per ASTM E 108.

1.3.2 Bond Strength of Face Panels

Minimum 5171 Kpa tensile strength per ASTM D 1037.

1.3.3 Impact Resistance

Provide "standard" impact faces.

1.3.4 Wind Loading

Provide exterior components which have been designed to withstand wind loads in accordance with ASCE 7 and a minimum uniform pressure of 1.77 Kpa inward and 1.77 Kpa outward with a maximum deflection of L/190.

1.4 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Wall Systems; G, AE.

Drawings shall include manufacturer's descriptive data, catalog cuts and installation instructions.

A schedule showing the location of each system shall be included with the drawings. Drawings shall indicate elevations and frame type, details and method of anchorage, depth of panel, details of construction, shape and thickness of materials, and details of joints and connections.

SD-06 Test Reports

Wall Framing Systems; G, AE.

Certified test reports shall state that systems meet the specified test and performance requirements.

SD-04 Samples

Sample Panels; G, AE.

Two samples of the complete unit.

1.5 PROJECT CONDITIONS

Check openings by field measurements before fabrication to ensure proper fitting of work; show measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay in the work.

1.6 Delivery and Storage

Materials delivered to the jobsite shall be inspected for damage, and shall be unloaded with a minimum of handling. Storage shall be in a dry location with adequate ventilation, free from dust, water, and other contaminants, and which permits easy access for inspecting and handling. Materials shall be neatly stored on the floor, properly stacked on nonabsorptive strips or wood platforms.

1.7 Warranty

Manufacturer's standard performance guarantees or warranties that extend beyond a one-year period shall be provided.

PART 2 PRODUCTS

2.1 Wall Panels

Panels shall consist of glass fiber reinforced polymer faces permanently bonded under a controlled heat and pressure process to a mechanically interlocked extruded aluminum grid core. The grid core shall be 6063-T6 aluminum I-beam panel shall be 70 mm thick, thermally broken, with a "U" value of .14.

2.1.1 Translucent Panel Face Sheet Combination

Color shall be "Rose" exterior with "White" interior.

2.1.2 Aluminum Frames

Provide 6063-T5 aluminum that is mitered and heli-arc welded at corners. Provide stainless steel fasteners and screws. Framing shall receive manufacture's high performance corrosion resistant coating. Frame color shall be dark bronze.

2.2 FABRICATION

Before shipment to the project site, complete fabrication, assembly, finishing, and other work to the greater extent possible. Disassemble components only as necessary for shipment and installation. Comply with AWS recommendations; grind exposed welds smooth and restore mechanical finish. Install reinforcing as necessary for performance requirements, sag resistance and rigidity. Separate dissimilar metals with zinc chromate primer, bituminous paint, or other separator that will prevent corrosion. Maintain accurate relation of planes and angles, with hairline fit of contracting members. Conceal fasteners wherever possible.

PART 3 EXECUTION

3.1 INSTALLATION OF WALL SYSTEMS

3.1.1 Installation

Do not install component parts which are observed to be defective including warped, bowed, dented, abraded and broken members, and including glass with edge damage. Remove and replace members which have been damaged during installation or thereafter before time of acceptance. Manufacturer's installation instructions shall be submitted. Do not cut, trim, weld or braze components parts during erection, in a manner which would damage finish, decrease strength, or result in a visual imperfection or a failure in performance of wall systems. Return component parts which require alteration to shop for prefabrication, if possible, or for replacement by new parts. Set units plumb, level, and true to line, without warp or rack of framing members. Provide proper support and anchor securely in place.

3.1.2 Protection of Aluminum

Separate aluminum and other corrodible metal surfaces from source of corrosion of electrolytic action at points of contact with other materials.

3.1.3 Sealant and Gaskets

Set members and other members in bed of sealant and provide joint fillers

or gaskets to provide weathertight construction.

3.1.4 Cleaning

Clean the completed system, inside and out, promptly after installation, exercising care to avoid damage to coatings. Clean panel surfaces after installation. Remove excess glazing and sealant compounds, dirt and other substances from aluminum surfaces.

3.1.5 Protection

Institute protective measures required throughout the remainder of the construction period to ensure that translucent wall system will be without damage or deterioration, other than normal weathering, at time of acceptance.

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SECTION 09100

METAL SUPPORT ASSEMBLIES

09/99

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3.1.1.2 Nonload-Bearing Wall Framing and Furring
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-- End of Section Table of Contents --

SECTION 09100

METAL SUPPORT ASSEMBLIES
09/99

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A 463/A 463M	(1997; Rev. A) Steel Sheet, Aluminum-Coated, by the Hot-Dip Process
ASTM A 653/A 653M	(1998) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM C 645	(1998) Nonstructural Steel Framing Members
ASTM C 754	(1997) Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Metal support systems; G, AE.

Submit for the erection of metal framing, and ceiling suspension systems. Indicate materials, sizes, thicknesses, and fastenings.

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the job site and store in ventilated dry locations. Storage area shall permit easy access for inspection and handling. If materials are stored outdoors, stack materials off the ground, supported on a level platform, and fully protected from the weather. Handle materials carefully to prevent damage. Remove damaged items and provide new items.

PART 2 PRODUCTS

2.1 MATERIALS

Provide steel materials for metal support systems with galvanized coating

ASTM A 653/A 653M, G-60; aluminum coating ASTM A 463/A 463M, T1-25; or a 55-percent aluminum-zinc coating.

2.1.1 Materials for Attachment of Gypsum Wallboard

2.1.1.1 Suspended and Furred Ceiling Systems

ASTM C 645.

2.1.1.2 Nonload-Bearing Wall Framing and Furring

ASTM C 645, but not thinner than 0.0329 inch thickness.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Systems for Attachment of Gypsum Wallboard

3.1.1.1 Suspended and Furred Ceiling Systems

ASTM C 754, except that framing members shall be 16 inches o.c. unless indicated otherwise.

3.1.1.2 Nonload-Bearing Wall Framing and Furring

ASTM C 754, except as indicated otherwise.

3.2 ERECTION TOLERANCES

Framing members which will be covered by finish materials such as wallboard, plaster, or ceramic tile set in a mortar setting bed, shall be within the following limits:

a. Layout of walls and partitions: 1/4 inch from intended position;

b. Plates and runners: 1/4 inch in 8 feet from a straight line;

c. Studs: 1/4 inch in 8 feet out of plumb, not cumulative; and

d. Face of framing members: 1/4 inch in 8 feet from a true plane.

Framing members which will be covered by ceramic tile set in dry-set mortar, latex-portland cement mortar, or organic adhesive shall be within the following limits:

a. Layout of walls and partitions: 1/4 inch from intended position;

b. Plates and runners: 1/8 inch in 8 feet from a straight line;

c. Studs: 1/8 inch in 8 feet out of plumb, not cumulative; and

d. Face of framing members: 1/8 inch in 8 feet from a true plane.

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DIVISION 09 - FINISHES

SECTION 09225

STUCCO

10/03

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SECTION 09225

STUCCO
10/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A 185	(2001) Steel Welded Wire Reinforcement, Plain, for Concrete
ASTM C 150	(1999a) Portland Cement
ASTM C 206	(1984; R 1997) Finishing Hydrated Lime
ASTM C 841	(1999) Installation of Interior Lathing and Furring
ASTM C 847	(1995) Metal Lath
ASTM C 897	(1996) Aggregate for Job-Mixed Portland Cement-Based Plasters
ASTM C 926	(1998a) Application of Portland Cement-Based Plaster
ASTM C 933	(1996a) Welded Wire Lath
ASTM C 1032	(1996) Woven Wire Plaster Base
ASTM C 1063	(1999) Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster
ASTM D 1784	(1999a) Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Lathing and Stucco; G, AE.

Drawings showing details of construction for reinforcement, furring, and grounds; including detailed description of the proposed job-mix proportions for base and finish coats; including identification of thickness of coats and locations where each mix and coating thickness will be used.

SD-03 Product Data

Materials; G, AE.

Manufacturers installation instructions for stucco materials.

SD-04 Samples

Colored Stucco Finish Coat; G, AE.

Samples including both a fabricated portion of unit of work and color samples.

One 12 inch square stucco panel showing finish texture and color and exposed reinforcement at the edges, one 12 inch square of reinforcement, and a 12 inch length of each accessory proposed, prior to proceeding with stucco work.

SD-07 Certificates

Local Materials.

Report stating which products and their quantities by cost which where manufactured within 500 miles of the project.

1.3 DELIVERY AND STORAGE

Packaged materials shall be delivered to the site in the original packages and containers with labels intact and seals unbroken. Cementitious materials shall be kept dry and stored off the ground under cover away from damp surfaces until ready to be used. Aggregate shall be covered to prevent the absorption or loss of moisture.

1.4 ENVIRONMENTAL CONDITIONS

Stucco shall not be applied when the ambient temperature is 40 degrees F or lower, or when a drop in temperature below 40 degrees F is expected within 48 hours after application.

1.5 GENERAL REQUIREMENTS

Contractor shall, as much as possible, select material manufacturers that are located within 500 miles of the project.

PART 2 PRODUCTS

2.1 PORTLAND CEMENT

Portland cement shall conform to ASTM C 150, white portland cement, Type I.

2.2 COLORED STUCCO FINISH COAT

Colored stucco finish coat shall be a mill mixed product using white portland cement and requiring only the addition of and mixing with water for application. Color shall be as shown on the drawings.

2.3 LIME

Lime shall conform to ASTM C 206, Type S.

2.4 SAND

Sand aggregate for job-mixed base coat and job-mixed finish coat stucco shall conform to ASTM C 897.

2.5 ACCESSORIES

Accessories shall be roll formed galvanized steel, or rigid polyvinyl chloride (PVC), except that cornerite and striplath shall be formed from steel sheets with manufacturer's standard galvanized coating. Vinyl members shall be in accordance with ASTM D 1784. Welded wire corner reinforcements shall be zinc coated, galvanized 17 gauge steel wire conforming to ASTM A 185. Furring shall include hangers, bolts, inserts, clips, fastenings, and attachments of number, size, and design to develop the full strength of the members.

2.6 STEEL FRAMING

Steel framing shall be as shown and shall be manufacturers standard products with shop applied protective coating.

2.7 METAL LATH

Metal lath shall conform to ASTM C 847, types and weights in accordance with the various spacing shown in ASTM C 841. Lath for vertical application on steel and wood framing supports shall be expanded metal or welded or woven wire and shall have paper backing with a minimum vapor permeance of 5 perms. Woven wire lath shall be a maximum 1-1/2 x 1-1/2 inch mesh wire of not less than 0.0540 inch nominal diameter and shall conform to ASTM C 1032. Welded wire lath shall conform to ASTM C 933, with openings not to exceed 2 x 2 inches. Expanded metal or wire lath shall be fabricated in a manner to provide not less than 1/4 inch keying between wire and paper backing and keying shall be obtained by a uniform series of slots in a perforated face paper woven between the wires.

2.8 WATER

Water shall be clean, fresh, potable, and free from amounts of oils, acids, alkalis and organic matter that would be injurious to the stucco.

PART 3 EXECUTION

3.1 FRAMING

Framing shall be installed as indicated.

3.2 CONTROL JOINTS

Control joints shall be located as indicated on the drawings.

Prefabricated control joint members shall be installed prior to the application of the stucco. Control joints shall be cleared of all stucco within the control area after stucco application and prior to final stucco set.

3.3 LATH

Lath shall be installed in accordance with ASTM C 841 or ASTM C 1063 except as otherwise specified. Metal and wire lath shall be applied straight, without buckles and with joints staggered. End laps of metal lath shall be not less than 1 inch. When paper-backed lath is used, the paper shall be split from the lath at all lap areas to provide a paper to paper and lath to lath lap. Horizontal joints shall be shiplapped. Lath shall be interrupted at all control joints.

3.3.1 Steel Supports

Metal lath without integral backing over vertical open steel backing frame construction shall be applied only after a backing of shiplapped waterproofed building paper or other approved material has been applied to the area to receive the stucco. Lath shall be secured to steel frames in accordance with ASTM C 841 or ASTM C 1063, as applicable.

3.3.2 Over Metal Lintels and Flashings

Lath over metal lintels shall be extended vertically over the angles to a height of not less than 6 inches and horizontally across the underside of the lintels and shall be secured in an approved manner. Lath over metal flashings shall lap the flashings not less than 2 inches and shall be extended vertically for a height of not less than 6 inches.

3.3.3 Special Shapes, Profiles, and Contours

Special shapes, profiles, and contours shall be formed with metal or aluminum furring and reinforcing.

3.4 FURRING

Furring shall be installed to true lines and surfaces and shall be rigidly supported and secured in place.

3.5 PREPARATION OF SURFACES

Preparation of surfaces for application of stucco to solid bases such as stone, masonry or concrete shall conform to the applicable requirements of ASTM C 926.

3.6 PROPORTIONS AND MIXING

Proportions and mixing for job-mixed base coat and finish coat shall conform to the applicable requirements of ASTM C 926. Mixing of mill-mixed finish coat shall be in accordance with the manufacturer's directions.

3.7 STUCCO APPLICATION

Stucco shall be applied in three coats to a thickness of not less than 1 inch as measured from the back plane of metal reinforcement, exclusive of ribs or dimples or from the face of solid backing or support, with or without metal reinforcement, to the finished stucco surface, including

moderate texture variations. Stucco application shall conform to the applicable requirements of ASTM C 926 and the following:

3.7.1 Workmanship

Items or features of the work in connection with or adjoining the stucco shall be in place, plumb, straight, and true prior to beginning the stucco work. Metal and wire lath, where required, shall be in place and positioned to provide a good key at back of lath. Each stucco coat shall be applied continuously in one general direction, without allowing mortar to dry at edges. Where it is impossible to work the full dimension of a wall surface in a continuous operation, jointing shall be made at a break, opening, or other natural division of the surface. Edges to be joined shall be dampened slightly to produce a smooth confluence. Exterior corners of stucco shall be slightly rounded. Stucco on soffit surfaces shall be pitched forward to form a drip.

3.7.2 Scratch Coat

Scratch coat shall be applied not less than 3/8 inch thick under sufficient pressure to form good keys and to completely embed the reinforcement. Before the scratch coat has set, it shall be lightly scratched in one direction and vertical surfaces shall be scratched in the horizontal direction only. The scratch coat shall be fog cured for a minimum of 72 hours.

3.7.3 Brown Coat

The scratch coat shall be dampened evenly to obtain uniform suction before the brown coat is applied. There shall be no visible water on the surface when the brown coat is applied. The brown coat shall be applied to the scratch coat with sufficient pressure to force the stucco into the scratches and shall be brought to a plumb, true, even plane with rod or straightedge. When set sufficiently, the brown coat shall be uniformly floated with a dry float to promote densification of the coat and to provide a surface receptive to bonding of the finish coat. Brown coat shall be fog cured for a minimum of 72 hours.

3.7.4 Finish Coat

Surfaces of the brown coat shall be dampened not more than 1 hour before the finish coat is to be applied to a uniform wetness with no free-standing water on the surface. The finish coat shall have a medium texture finish and shall conform to the approved sample. The finish coat shall be fog cured for a minimum of 48 hours. Care shall be taken to prevent staining.

3.7.5 Surface Tolerance

When a 10 foot straightedge is placed at any location on the finished surface of the stucco, excluding rough-textured finish, the surface shall not vary more than 1/8 inch from the straightedge.

3.8 CURING AND PROTECTION

Fog curing shall be accomplished by applying a fine mist of water to the stucco. Care shall be exercised during fog curing to avoid erosion damage to the stucco surfaces. A solid stream of water shall not be used. Frequency of fogging shall be not less than three times daily. When directed the Contractor shall protect the stucco from the direct rays of

the sun during severe drying conditions using canvas, cloth or other approved sheet material.

3.9 PATCHING AND POINTING

Loose, cracked, damaged or defective work shall be replaced or patched as directed. Patching shall match existing work in texture and color and shall be finished flush.

-- End of Section --

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SECTION 09250

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SECTION 09250

GYPSUM BOARD
11/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A108.11	(1992) Interior Installation of Cementitious Backer Units
ANSI A108.1	(1992) Cementitious Backer Units

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 36	(1999) Gypsum Wallboard
ASTM C 475	(1994) Joint Compound and Joint Tape for Finishing Gypsum Board
ASTM C 514	(1996) Nails for the Application of Gypsum Board
ASTM C 840	(2001) Application and Finishing of Gypsum Board
ASTM C 954	(2000) Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
ASTM C 1002	(2000) Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases
ASTM C 1047	(1999) Accessories for Gypsum Wallboard and Gypsum Veneer Base
ASTM C 1396/C 1396M	(2000) Standard Specification for Gypsum Board
ASTM D 226	(1997) Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
ASTM D 1037	(1999) Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials

ASTM D 2394	(1999) Standard Method for Simulated Service Testing of Wood and Wood-Base Finish Flooring
ASTM D 5420	(1998) Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact)
ASTM E 695	(1997) Standard Method for Measure Relative Resistance of Wall, Floor and Roof Construction to Impact Loads

GYPSUM ASSOCIATION (GA)

GA 214	(1996) Recommended Levels of Gypsum Board Finish
GA 216	(2000) Application and Finishing of Gypsum Board
GA 600	(2000) Fire Resistance and Sound Control Design Manual

UNDERWRITERS LABORATORIES (UL)

UL Fire Resist Dir	(2000) Fire Resistance Directory

1.2 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-03 Product Data; .

Cementitious backer units

Impact Resistant Gypsum Board

Accessories

Submit for each type of gypsum board and for cementitious backer units.

Adhesives

Manufacturer's descriptive data, documentation stating physical characteristics and mildew and germicidal characteristics. Material Safety Data Sheets (MSDS) for all primers and adhesives shall be provided to the Contracting Officer. Highlight VOC emissions.

SD-07 Certificates

Asbestos Free Materials; G, AO.

Certify that gypsum board types, gypsum backing board types, cementitious backer units, and joint treating materials do not

contain asbestos.

Regulatory Requirements

Report stating that the products contain recycled materials and indicating the actual percentages of post-consumer and/or post-industrial recycled materials by weight.

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery

Deliver materials in the original packages, containers, or bundles with each bearing the brand name, applicable standard designation, and name of manufacturer, or supplier.

1.3.2 Storage

Keep materials dry by storing inside a sheltered building. Where necessary to store gypsum board and cementitious backer units outside, store off the ground, properly supported on a level platform, and protected from direct exposure to rain, snow, sunlight, and other extreme weather conditions. Provide adequate ventilation to prevent condensation.

1.3.3 Handling

Neatly stack gypsum board and cementitious backer units flat to prevent sagging or damage to the edges, ends, and surfaces.

1.4 ENVIRONMENTAL CONDITIONS

1.4.1 Temperature

Maintain a uniform temperature of not less than 50 degrees F in the structure for at least 48 hours prior to, during, and following the application of gypsum board, cementitious backer units, and joint treatment materials, or the bonding of adhesives.

1.4.2 Exposure to Weather

Protect gypsum board and cementitious backer unit products from direct exposure to rain, snow, sunlight, and other extreme weather conditions.

1.5 QUALIFICATIONS

Manufacturer shall specialize in manufacturing the types of material specified and shall have a minimum of 5 years of documented successful experience. Installer shall specialize in the type of gypsum board work required and shall have a minimum of 3 years of documented successful experience.

1.6 GENERAL REQUIREMENTS

Contractor shall, as much as possible, select material manufacturers that reduce pollutant and waste, recycle waste, reuse resources and scrap, and reclaim materials instead of disposing into a landfill.

PART 2 PRODUCTS

2.1 MATERIALS

Conform to specifications, standards and requirements specified herein. Provide gypsum board types, gypsum backing board types, cementitious backing units, and joint treating materials manufactured from asbestos free materials only.

2.1.1 Gypsum Board

ASTM C 36 and ASTM C 1396/C 1396M.

2.1.1.1 Type X (Special Fire-Resistant)

48 inches wide, 5/8 inch thick, tapered edges. Regardless of the fire-rating of the assembly, all gypsum board for this project shall be "Type X".

2.1.2 Impact Resistant Gypsum Board

48 inch wide, 5/8 inch thick, tapered edges.
Reinforced gypsum panel with imbedded fiber mesh or lexan backing testing in accordance with the following tests. Provide fasteners that meet manufacturer requirements and specifications stated within this section. Product shall be "Type X" all locations and shall be used on all vertical surfaces and walls.

2.1.2.1 Structural Failure Test

ASTM E 695 or ASTM D 2394 for structural failure (drop penetration). ASTM E 695using a 60 lb sand filled leather bag, resisting no less than 300 ft. lb. cumulative impact energy before failure or ASTM D 2394 using 5.5 inches hemispherical projectile resisting no less than 264 ft. lb. before failure. Test specimen stud spacing shall be 16 inch or greater on center.

2.1.2.2 Indentation Test

ASTM D 5420 or ASTM D 1037 for indentation resistance. ASTM D 5420 using a 32 oz weight with a 5/8 inch hemispherical impacting head dropped once 3 feet creating not more than 0.137 inch indentation or ASTM D 1037 using no less than 470 lb weight applied to the 0.438 inch diameter ball to create not more than a 0.0197 inch indentation depth.

2.1.3 Cementitious Backer Units

ANSI A108.1.

2.1.4 Joint Treatment Materials

ASTM C 475.

2.1.4.1 Embedding Compound

Specifically formulated and manufactured for use in embedding tape at gypsum board joints and compatible with tape, substrate and fasteners.

2.1.4.2 Finishing or Topping Compound

Specifically formulated and manufactured for use as a finishing compound.

2.1.4.3 All-Purpose Compound

Specifically formulated and manufactured to serve as both a taping and a finishing compound and compatible with tape, substrate and fasteners.

2.1.4.4 Setting or Hardening Type Compound

Specifically formulated and manufactured for use with fiber glass mesh tape.

2.1.4.5 Joint Tape

Cross-laminated, tapered edge, reinforced paper, or fiber glass mesh tape recommended by the manufacturer.

2.1.5 Fasteners

2.1.5.1 Nails

ASTM C 514.

2.1.5.2 Screws

ASTM C 1002, Type "G", Type "S" or Type "W" steel drill screws for fastening gypsum board to gypsum board and steel framing members less than 0.033 inch thick. ASTM C 954 steel drill screws for fastening gypsum board to steel framing members 0.033 to 0.112 inch thick. Provide cementitious backer unit screws with a polymer coating.

2.1.5.3 Staples

No. 16 USS gage flattened galvanized wire staples with 7/16 inch wide crown outside measurement and divergent point for base ply of two-ply gypsum board application. Use as follows:

Length of Legs (inch)	Thickness of Gypsum Board (inch)
1 1/4	5/8

2.1.6 Adhesives

Do not use adhesive containing benzene, carbon tetrachloride, or trichloroethylene. Adhesives shall be as recommended by the manufacturer and comply with local indoor air quality standards. VOC content must be less than the current VOC content limits of SCAQMD Rule #1168.

2.1.6.1 Adhesive for Fastening Gypsum Board to Metal Framing

Type recommended by gypsum board manufacturer.

2.1.7 Accessories

ASTM C 1047. Fabricate from corrosion protected steel or plastic designed for intended use. Accessories manufactured with paper flanges are not acceptable. Flanges shall be free of dirt, grease, and other materials that may adversely affect bond of joint treatment. Provide prefinished or

job decorated materials.

2.1.8 Asphalt Impregnated Building Felt

The moisture barrier over gypsum sheathing shall be 15-lb asphalt impregnated felt conforming to ASTM D 226 Type I (No. 15).

2.1.9 Water

Clean, fresh, and potable.

PART 3 EXECUTION

3.1 EXAMINATION

3.1.1 Framing and Furring

Verify that framing and furring are securely attached and of sizes and spacing to provide a suitable substrate to receive gypsum board and cementitious backer units. Verify that all blocking, headers and supports are in place to support plumbing fixtures and to receive soap dishes, grab bars, towel racks, and similar items. Do not proceed with work until framing and furring are acceptable for application of gypsum board and cementitious backer units.

3.1.2 Gypsum Board and Framing

Verify that surfaces of gypsum board and framing to be bonded with an adhesive are free of dust, dirt, grease, and any other foreign matter. Do not proceed with work until surfaces are acceptable for application of gypsum board with adhesive.

3.2 APPLICATION OF GYPSUM BOARD

Apply gypsum board to framing and furring members in accordance with ASTM C 840 or GA 216 and the requirements specified herein. Apply gypsum board with separate panels in moderate contact; do not force in place. Stagger end joints of adjoining panels. Neatly fit abutting end and edge joints. Use gypsum board of maximum practical length. Cut out gypsum board as required to make neat close joints around openings. In vertical application of gypsum board, provide panels in lengths required to reach full height of vertical surfaces in one continuous piece. Surfaces of gypsum board and substrate members may be bonded together with an adhesive, except where prohibited by fire rating(s). Treat edges of cutouts for plumbing pipes, screwheads, and joints with water-resistant compound as recommended by the gypsum board manufacturer. Provide type of gypsum board for use in each system specified herein as indicated.

3.2.1 Application of Gypsum Board to Steel Framing and Furring

Apply in accordance with ASTM C 840, System VIII or GA 216.

3.2.2 Floating Interior Angles

Locate the attachment fasteners adjacent to ceiling and wall intersections in accordance with ASTM C 840, System XII or GA 216, for single-ply applications of gypsum board to wood framing.

3.2.3 Control Joints

Install expansion and contraction joints in ceilings and walls in accordance with ASTM C 840, System XIII or GA 216, unless indicated otherwise. Control joints between studs in fire-rated construction shall be filled with firesafing insulation to match the fire-rating of construction.

3.2.4 Application of Impact Resistant Gypsum Board

Apply in accordance with applicable system of ASTM C 840 as specified or GA 216. Follow manufacturers written instructions on how to cut, drill and attach board.

3.3 APPLICATION OF CEMENTITIOUS BACKER UNITS

3.3.1 Application

Apply cementitious backer units in accordance with ANSI A108.11. A 15 lb asphalt impregnated, continuous felt paper membrane shall be placed behind cementitious backer units, between backer units and studs or base layer of gypsum board. Membrane shall be placed with a minimum 6 inch overlap of sheets laid shingle style.

3.3.2 Joint Treatment

ANSI A108.11.

3.4 FINISHING OF GYPSUM BOARD

Tape and finish gypsum board in accordance with ASTM C 840, GA 214 and GA 216. Plenum areas above ceilings shall be finished to Level 1 in accordance with GA 214. Walls and ceilings without critical lighting to receive flat paints, light textures, or wall coverings shall be finished to Level 4 in accordance with GA 214. Unless otherwise specified, all gypsum board walls, partitions and ceilings shall be finished to Level 5 in accordance with GA 214. Provide joint, fastener depression, and corner treatment. Do not use fiber glass mesh tape with conventional drying type joint compounds; use setting or hardening type compounds only.

3.4.1 Uniform Surface

Wherever gypsum board is to receive eggshell, semigloss or gloss paint finish, or where severe, up or down lighting conditions occur, finish gypsum wall surface in accordance to GA 214 Level 5. In accordance with GA 214 Level 5, apply a thin skim coat of joint compound to the entire gypsum board surface, after the two-coat joint and fastener treatment is complete and dry. All surfaces in Entry, Lobby, Desk, and Corridors shall be finished to Level 5.

3.5 SEALING

Seal openings around pipes, fixtures, and other items projecting through gypsum board and cementitious backer units as specified in Section 07920 "Joint Sealants." Apply material with exposed surface flush with gypsum board or cementitious backer units.

3.6 FIRE-RESISTANT ASSEMBLIES

Wherever fire-rated construction is indicated, provide materials and application methods, including types and spacing of fasteners, wall and ceiling framing in accordance with the specifications contained in UL Fire Resist Dir for the Design Number(s) indicated, or GA 600 for the File Number(s) indicated. Joints of fire-rated gypsum board enclosures shall be closed and sealed in accordance with UL test requirements or GA requirements. Penetrations through rated partitions and ceilings shall be sealed tight in accordance with tested systems. Fire ratings shall be as indicated.

3.7 PATCHING

Patch surface defects in gypsum board to a smooth, uniform appearance, ready to receive finish as specified.

-- End of Section --

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SECTION 09310

CERAMIC TILE, QUARRY TILE, AND PAVER TILE

8/02

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SECTION 09310

CERAMIC TILE, QUARRY TILE, AND PAVER TILE
8/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A108.1	(1999) Installation of Ceramic Tile; including A108.1A-C, 108.4-.13, 118.1-.10, A136.1
ANSI A108.6	(1992) Installation of Ceramic Tile with Chemical Resistant, Water cleanable Setting and Grouting Epoxy
ANSI A137.1	(1988) Ceramic Tile

ASTM INTERNATIONAL (ASTM)

ASTM A 185	(1997) Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
ASTM C 144	(1999) Aggregate for Masonry Mortar
ASTM C 150	(1999a) Portland Cement
ASTM C 241	(1997) Abrasion Resistance of Stone Subjected to Foot Traffic
ASTM C 373	(1988; R 1994) Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products
ASTM C 482	(1981; R 1996) Bond Strength of Ceramic Tile to Portland Cement
ASTM C 501	(1984; R 2002) Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser
ASTM C 648	(1998) Breaking Strength of Ceramic Tile
ASTM C 847	(1995) Metal Lath
ASTM C 1026	(1987; R 1996) Measuring the Resistance of Ceramic Tile to Freeze-Thaw Cycling

ASTM C 1027	(1999) Determining Visible Abrasion Resistance of Glazed Ceramic Tile
ASTM C 1028	(1996) Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method

ASTM INTERNATIONAL (ASTM)

MARBLE INSTITUTE OF AMERICA (MIA)

MIA Design Manual	(1991) Design Manual IV Dimensional Stone

TILE COUNCIL OF AMERICA (TCA)

TCA Hdbk	(1997) Handbook for Ceramic Tile Installation

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

36 CFR 1191	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Tile.
Setting-Bed.
Mortar, Grout, and Adhesive.

Manufacturer's catalog data and preprinted installation and cleaning instructions.

SD-04 Samples

Tile; G, AE.
Accessories; G, AE.
Marble Thresholds; G, AE.

Samples of sufficient size to show color range, pattern, type and joints.

SD-07 Certificates

Tile; .
Mortar, Grout, and Adhesive; .

Certificates indicating conformance with specified requirements. A master grade certificate shall be furnished for tile.

Regulatory Requirements

Report stating that the products contain recycled materials and indicating he actual percentages of post-consumer and/or post-industrial recycled materials by weight.

1.3 DELIVERY AND STORAGE

Materials shall be delivered to the project site in manufacturer's original unopened containers with seals unbroken and labels and hallmarks intact. Materials shall be kept dry, protected from weather, and stored under cover in accordance with manufacturer's instructions.

1.4 ENVIRONMENTAL REQUIREMENTS

Ceramic tile work shall not be performed unless the substrate and ambient temperature is at least 50 degrees F and rising. Temperature shall be maintained above 50 degrees F while the work is being performed and for at least 7 days after completion of the work. When temporary heaters are used they shall be vented to the outside to avoid carbon dioxide damage to new tilework.

1.5 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a 1-year period shall be provided.

1.6 EXTRA STOCK

Supply an extra two percent of each type tile used in clean and marked cartons.

1.7 GENERAL REQUIREMENTS

Contractor shall, as much as possible, select material manufacturers that reduce pollutant and waste, recycle waste, reuse resources and scrap, and reclaim materials instead of disposing into a landfill.

PART 2 PRODUCTS

2.1 TILE

Tile shall be standard grade conforming to ANSI A137.1. Containers shall be grade sealed. Seals shall be marked to correspond with the marks on the signed master grade certificate. Tile shall be impact resistant with a minimum breaking strength for wall tile of 90 lbs and 250 lbs for floor tile in accordance with ASTM C 648. Tile for cold climate projects shall be rated frost resistant by the manufacturer as determined by ASTM C 1026. Water absorption shall be 0.50 maximum percent in accordance with ASTM C 373. Floor tile shall have a minimum coefficient of friction of 0.60 wet and dry in accordance with ASTM C 1028. Floor tile shall be Class III-Medium Heavy Traffic, durability classification as rated by the manufacturer when tested in accordance with ASTM C 1027 for abrasion resistance as related to foot traffic.

2.1.1 Mosaic Tile

Ceramic mosaic tile and trim shall be unglazed porcelain unpolished with sharply formed face. Tile size shall be 2 x 2 inches. Color shall be indicated on drawings.

2.1.2 Quarry Tile

Quarry tile and trim shall be unglazed with smooth surface. Tile shall be 8 x 8 x 1/2 inch. Color shall be indicated on drawings.

2.1.3 Porcelain Tile

Porcelain tile and trim shall be unglazed with the color extending uniformly through the body of the tile. Tile size shall be nominal 12 by 12 inches by 5/16 inch thick. Tile shall meet or exceed the following criteria: Abrasive wear in accordance with ASTM C 501 and bonding strength in accordance with ASTM C 482. Tile shall comply with 36 CFR 1191 for coefficient of friction for interior floors. Color shall be indicated on the drawings.

2.1.4 Porcelain Wall Tile

Porcelain wall tile and trim shall be cushion edged with matte glaze. Tile shall be 2 x 2 inches. Color shall be indicated on drawings.

2.1.5 Bright Glazed Wall Tile

Bright glazed wall tile and trim shall be cushion edged with matte glaze. Tile shall be 6 x 6 inches. Color shall be indicated on drawings.

2.2 SETTING-BED

The setting-bed shall be composed of the following:

2.2.1 Portland Cement

Cement shall conform to ASTM C 150, Type I, white for wall mortar and gray for other uses.

2.2.2 Sand

Sand shall conform to ASTM C 144.

2.2.3 Metal Lath

Metal lath shall be flat expanded type conforming to ASTM C 847, and weighing not less than 2.5 pounds per square yard.

2.2.4 Reinforcing Wire Fabric

Wire fabric shall conform to ASTM A 185. Wire shall be either 2 x 2 inch mesh, 16/16 wire or 1-1/2 x 2 inch mesh, 16/13 wire.

2.3 WATER

Water shall be potable.

2.4 MORTAR, GROUT, AND ADHESIVE

Mortar, grout, and adhesive shall conform to the following:

2.4.1 Dry-Set Portland Cement Mortar

ANSI A108.1.

2.4.2 Latex-Portland Cement Mortar

ANSI A108.1.

2.4.3 Ceramic Tile Grout

ANSI A108.1; dry-set grout or latex-portland cement grout.

2.4.4 Epoxy Resin Grout

ANSI A108.1.

2.4.5 Cementitious Backer Board

Cementitious backer units, for use as tile substrate over wood sub-floors, shall be in accordance with ANSI A108.1. Cementitious backer units shall be 1/2inch thick.

2.5 MARBLE THRESHOLDS

Marble thresholds shall be of size required by drawings or conditions. Marble shall be Group A as classified by MIA Design Manual. Marble shall have a fine sand-rubbed finish and shall be white in color as approved by the Contracting Officer. Marble abrasion shall be not less than 12.0 when tested in accordance with ASTM C 241.

PART 3 EXECUTION

3.1 PREPARATORY WORK AND WORKMANSHIP

Surface to receive tile shall be inspected and shall conform to the requirements of ANSI A108.1 for surface conditions for the type setting bed specified and for workmanship. Variations of surface to be tiled shall fall within maximum values shown below:

TYPE	WALLS	FLOORS
Dry-Set Mortar	1/8 inch in 8 ft.	1/8 inch in 10 ft.
Organic Adhesives	1/8 inch in 8 ft.	1/16 inch in 3 ft.
Latex portland cement mortar	1/8 inch in 8 ft.	1/8 inch in 10 ft.
Epoxy	1/8 inch in 8 ft.	1/8 inch in 10 ft.

3.2 GENERAL INSTALLATION REQUIREMENTS

Tile work shall not be started until roughing in for mechanical and electrical work has been completed and tested, and built-in items requiring membrane waterproofing have been installed and tested. Floor tile installation shall not be started in spaces requiring wall tile until after wall tile has been installed. Tile in colors and patterns indicated shall be applied in the area shown on the drawings. Tile shall be installed with the respective surfaces in true even planes to the elevations and grades

shown. Special shapes shall be provided as required for sills, jambs, recesses, offsets, external corners, and other conditions to provide a complete and neatly finished installation. Tile bases and coves shall be solidly backed with mortar.

3.3 INSTALLATION OF WALL TILE

Wall tile shall be installed in accordance with the TCA Hdbk, method W243. Wall tile in kitchen shall be installed in accordance with TCA HDBK, Method W244.

3.3.1 Dry-Set Mortar and Latex-Portland Cement Mortar

Dry-set or Latex-portland cement shall be used to install tile in accordance with ANSI A108.1. Latex portland cement shall be used when installing porcelain ceramic tile.

3.3.2 Epoxy Grout

Epoxy grout installation shall conform to ANSI A108.6.

3.4 INSTALLATION OF FLOOR TILE

Floor tile shall be installed in accordance with TCA Hdbk, method F114.

3.4.1 Workable or Cured Mortar Bed

Floor tile shall be installed over a workable mortar bed or a cured mortar bed at the option of the Contractor. Workable mortar bed materials and installation shall conform to ANSI A108.1. Cured mortar bed and materials shall conform to ANSI A108.1. Joints between quarry tile shall be between 1/4 inch and 3/8 inch in width and shall be uniform in width.

3.4.2 Dry-Set and Latex-Portland Cement

Dry-set or Latex-portland cement mortar shall be used to install tile directly over properly cured, plane, clean concrete slabs in accordance with ANSI A108.1. Latex portland cement shall be used when installing porcelain ceramic tile.

3.4.3 Resinous Grout

When resinous grout is indicated, quarry tile shall be grouted with epoxy resin grout. Joints shall be raked and cleaned to the full depth of the tile and neutralized when recommended by the resin manufacturer. Epoxy resin grout shall be installed in conformance with ANSI A108.1. Installation of resin grout shall be in strict accordance with manufacturer's instructions for proportioning, mixing, installing, and curing. Recommended temperature shall be maintained in the area and on the surface to be grouted. After grouting, tile shall be left free of grout stain.

3.4.4 Ceramic Tile Grout

Ceramic Tile grout shall be prepared and installed in accordance with ANSI A108.1.

3.5 INSTALLATION OF MARBLE THRESHOLDS

Thresholds shall be installed where indicated in a manner similar to that of the ceramic tile floor. Thresholds shall be the full width of the opening. Head joints at ends shall not exceed 1/4 inch in width and shall be grouted full as specified for ceramic tile.

3.6 EXPANSION JOINTS

Joints shall be formed as indicated and sealed as specified in Section 07920 JOINT SEALANTS.

3.6.1 Walls

Expansion joints shall be provided at control joints in backing material. Wherever backing material changes, an expansion joint shall be installed to separate the different materials.

3.6.2 Floors

Expansion joints shall be provided over construction joints, control joints, and expansion joints in concrete slabs. Expansion joints shall be provided where tile abuts restraining surfaces such as perimeter walls, curbs and columns and at intervals of 24 to 36 feet each way in large interior floor areas and 12 to 16 feet each way in large exterior areas or areas exposed to direct sunlight or moisture. Expansion joints shall extend through setting-beds and fill.

3.7 CLEANING AND PROTECTING

Upon completion, tile surfaces shall be thoroughly cleaned in accordance with manufacturer's approved cleaning instructions. Acid shall not be used for cleaning glazed tile. Floor tile with resinous grout or with factory mixed grout shall be cleaned in accordance with instructions of the grout manufacturer. After the grout has set, tile wall surfaces shall be given a protective coat of a noncorrosive soap or other approved method of protection. Tiled floor areas shall be covered with building paper before foot traffic is permitted over the finished tile floors. Board walkways shall be laid on tiled floors that are to be continuously used as passageways by workmen. Damaged or defective tiles shall be replaced.

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SECTION 09510

ACOUSTICAL CEILINGS
07/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A 366	(1997e1) Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality
ASTM A 580	(1998) Stainless Steel Wire
ASTM A 641	(1998) Zinc-Coated (Galvanized) Carbon Steel Wire
ASTM A 653	(2001a) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM B 633	(1998e1) Electrodeposited Coatings of Zinc on Iron and Steel
ASTM C 423	(2001) Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
ASTM C 635	(2000) Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings
ASTM C 636	(1996) Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels
ASTM E 580	(2000) Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Moderate Seismic Restraint
ASTM E 795	(2000) Mounting Test Specimens During Sound Absorption Tests
ASTM E 1264	(1998) Acoustical Ceiling Products
ASTM E 1414	(2000a) Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
ASTM E 1477	(1998a) Luminous Reflectance Factor of

Acoustical Materials by Use of
Integrating-Sphere Reflectometers

U.S. ARMY CORPS OF ENGINEERS (USACE)

TI 809-04 (1998) Seismic Design for Buildings

UNDERWRITERS LABORATORIES (UL)

UL Fire Resist Dir (2004) Fire Resistance Directory

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Approved Detail Drawings; G, AO.

Drawings showing suspension system, method of anchoring and fastening, details, and reflected ceiling plan.

SD-03 Product Data

Acoustical Ceiling Systems.

Manufacturer's descriptive data, catalog cuts, and installation instructions. Submittals which do not provide adequate data for the product evaluation will be rejected.

SD-04 Samples

Acoustical Units; G, AO.

Two samples of each type of acoustical unit and each type of suspension grid tee section showing texture, finish, and color.

SD-06 Test Reports

Fire Resistive Ceilings.
Ceiling Attenuation Class and Test.

Reports by an independent testing laboratory attesting that acoustical ceiling systems meet specified sound transmission requirements. Data attesting to conformance of the proposed system to Underwriters Laboratories requirements for the fire endurance rating listed in UL Fire Resist Dir may be submitted in lieu of test reports.

SD-07 Certificates

Acoustical Units.

Certificate attesting that the mineral based acoustical units

furnished for the project contain recycled material and showing the actual percentages of post-consumer and/or past-industrial recycled materials by weight.

1.3 GENERAL REQUIREMENTS

Acoustical treatment shall consist of sound controlling units mechanically mounted on a ceiling suspension system. The unit size, texture, finish, and color shall be as specified. The location and extent of acoustical treatment shall be as shown on the approved detail drawings.

1.3.1 Ceiling Attenuation Class and Test

The ceiling attenuation class (CAC) of the ceiling system shall be 35 for ACT-1 and 38 for ACT-2 when determined in accordance with ASTM E 1414. Provide fixture attenuators over light fixtures and other ceiling penetrations, and provide acoustical blanket insulation adjacent to partitions, as required to achieve the specified CAC. Test ceiling shall be continuous at the partition and shall be assembled in the suspension system in the same manner that the ceiling will be installed on the project.

1.3.2 Ceiling Sound Absorption

Determine the NRC in accordance with ASTM C 423 Method of Test.

1.3.3 Light Reflectance

Determine light reflectance factor in accordance with ASTM E 1477 Test Method.

1.4 DELIVERY AND STORAGE

Materials shall be delivered to the site in the manufacturer's original unopened containers with brand name and type clearly marked. Materials shall be carefully handled and stored in dry, watertight enclosures. Immediately before installation, acoustical units shall be stored for not less than 24 hours at the same temperature and relative humidity as the space where they will be installed in order to assure proper temperature and moisture acclimation.

1.5 ENVIRONMENTAL REQUIREMENTS

A uniform temperature of not less than 60 degrees F nor more than 85 degrees F and a relative humidity of not more than 70 percent shall be maintained for 24 hours before, during, and 24 hours after installation of acoustical units.

1.6 SCHEDULING

Interior finish work such as plastering, concrete and terrazzo work shall be complete and dry before installation. Mechanical, electrical, and other work above the ceiling line shall be completed and heating, ventilating, and air conditioning systems shall be installed and operating in order to maintain temperature and humidity requirements.

1.7 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a one year period shall be provided. Standard performance guarantee

or warranty shall contain an agreement to repair or replace acoustical panels that fail within the warranty period. Failures include, but are not limited to, sagging and warping of panels; rusting and manufacturers defects of grid system.

1.8 EXTRA MATERIALS

Spare tiles of each color shall be furnished at the rate of 5 tiles for each 1000 tiles installed. Tiles shall be from the same lot as those installed.

PART 2 PRODUCTS

2.1 ACOUSTICAL UNITS

Acoustical units shall conform to ASTM E 1264, Class A, and the following requirements:

2.1.1 Units for Exposed-Grid System ACT-1

Type: III (non-asbestos mineral fiber with painted finish) shall have a minimum recycled material content of 18 percent.

Minimum NRC: .40 when tested on mounting Type E-400 of ASTM E 795.

Pattern: E I.

Nominal size: 24 by 24 inches.

Edge detail: Angled tegular.

Finish: Factory-applied standard finish.

Minimum LR coefficient: .86.

Minimum CAC: 35.

2.1.2 Units for Exposed-Grid System ACT-2

Type: XX (high density ceramic-like composition with scrubbable finish).

Minimum NRC: .55 when tested on mounting Type B or Type E-400 of ASTM E 795.

Pattern: G.

Nominal size: 24 by 24 inches.

Edge detail: square.

Finish: Factory-applied standard finish.

Minimum LR coefficient: 0.82.

Minimum CAC: 38.

2.2 SUSPENSION SYSTEM

Suspension system shall be standard exposed-gridstandard width flange, and shall conform to ASTM C 635 for intermediate-duty systems. Surfaces

exposed to view shall be aluminum or steel with a factory-applied white baked-enamel finish. Wall molding shall have a flange of not less than 15/16 inch. Standard corners shall be provided. Suspended ceiling framing system shall have the capability to support the finished ceiling, light fixtures, air diffusers, and accessories, as shown. The suspension system shall have a maximum deflection of 1/360 of span length. Seismic details shall conform to the guidance in TI 809-04 and ASTM E 580.

2.3 HANGERS

Hangers and attachment shall support a minimum 300 pound ultimate vertical load without failure of supporting material or attachment.

2.3.1 Wires

Wires shall conform to ASTM A 641, Class 1, 0.106 inches in diameter. ASTM A 580, composition 302 or 304, condition annealed stainless steel, 0.1055 inches in diameter.

2.3.2 Straps

Straps shall be 1 by 3/16 inch galvanized steel conforming to ASTM A 653, with a light commercial zinc coating or ASTM A 366with an electrodeposited zinc coating conforming to ASTM B 633, Type RS.

2.3.3 Rods

Rods shall be 3/16 inch diameter threaded steel rods, zinc or cadmium coated.

2.4 FINISHES

Acoustical units and suspension system members shall have manufacturer's standard textures, patterns and finishes as specified. Ceiling suspension system components shall be treated to inhibit corrosion.

2.5 COLORS AND PATTERNS

Colors and patterns for acoustical units and suspension system components shall be per finish selection drawings.

PART 3 EXECUTION

3.1 INSTALLATION

Examine surfaces to receive directly attached acoustical units for uneveness, irregularities, and dampness that would affect quality and execution of the work. Areas where acoustical units will be cemented shall be free of oils, form residue, or other materials that reduce bonding capabilities of the adhesive. Interior finish work such as plastering, concrete, and terrazzo work shall be completed and dry before installation. Mechanical, electrical, and other work above the ceiling line shall be completed and approved prior to the start of acoustical ceiling installation. Acoustical work shall be provided complete with necessary fastenings, clips, and other accessories required for a complete installation. Mechanical fastenings shall not be exposed in the finished work. Hangers shall be laid out for each individual room or space. Hangers shall be placed to support framing around beams, ducts, columns, grilles, and other penetrations through ceilings. Main runners and

carrying channels shall be kept clear of abutting walls and partitions. At least two main runners shall be provided for each ceiling span. Wherever required to bypass an object with the hanger wires, a subsuspension system shall be installed, so that all hanger wires will be plumb.

3.1.1 Suspension System

Suspension system shall be installed in accordance with ASTM C 636 and as specified herein. There shall be no hanger wires or other loads suspended from underside of steel decking.

3.1.1.1 Plumb Hangers

Hangers shall be plumb and shall not press against insulation covering ducts and pipes. Where lighting fixtures are supported from the suspended ceiling system, hangers shall be provided at a minimum of four hangers per fixture and located not more than 6 inches from each corner of each fixture.

3.1.1.2 Splayed Hangers

Where hangers must be splayed (sloped or slanted) around obstructions, the resulting horizontal force shall be offset by bracing, countersplaying, or other acceptable means.

3.1.2 Wall Molding

Wall molding shall be provided where ceilings abut vertical surfaces. Miter corners where wall moldings intersect or install corner caps. Wall molding shall be secured not more than 3 inches from ends of each length and not more than 16 inches on centers between end fastenings. Wall molding springs shall be provided at each acoustical unit in semi-exposed or concealed systems.

3.1.3 Acoustical Units

Acoustical units shall be installed in accordance with the approved installation instructions of the manufacturer. Edges of acoustical units shall be in close contact with metal supports, with each other, and in true alignment. Acoustical units shall be arranged so that units less than one-half width are minimized. Units in exposed-grid system shall be held in place with manufacturer's standard hold-down clips, if units weigh less than 1 psf or if required for fire resistance rating.

3.2 CLEANING

Following installation, dirty or discolored surfaces of acoustical units shall be cleaned and left free from defects. Units that are damaged or improperly installed shall be removed and new units provided as directed.

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SECTION 09570

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SECTION 09570

WOOD CEILING SYSTEM
07/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

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ASTM A 366	(1997e1) Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality
ASTM A 641	(1998) Zinc-Coated (Galvanized) Carbon Steel Wire
ASTM A 653	(2001a) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM B 633	(1998e1) Electrodeposited Coatings of Zinc on Iron and Steel
ASTM C 635	(2000) Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings
ASTM C 636	(2003) Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels
ASTM E 580	(2000) Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Moderate Seismic Restraint

U.S. ARMY CORPS OF ENGINEERS (USACE)

TI 809-04	(1998) Seismic Design for Buildings

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Approved Detail Drawings.

Drawings showing suspension system, method of anchoring and fastening, details, and reflected ceiling plan.

SD-03 Product Data

Wood Ceiling Systems.

Manufacturer's descriptive data, catalog cuts, and installation instructions. Submittals which do not provide adequate data for the product evaluation will be rejected.

SD-04 Samples

Wood Slat; G, AO.

Two samples of wood slats showing texture, finish, and color.

1.3 DELIVERY AND STORAGE

Materials shall be delivered to the site in the manufacturer's original unopened containers with brand name and type clearly marked. Materials shall be carefully handled and stored in dry, watertight enclosures. Immediately before installation, acoustical units shall be stored for not less than 24 hours at the same temperature and relative humidity as the space where they will be installed in order to assure proper temperature and moisture acclimation.

1.4 ENVIRONMENTAL REQUIREMENTS

A uniform temperature of not less than 60 degrees F nor more than 80 degrees F and a relative humidity of not more than 55 percent and not less than 35 percent shall be maintained for 24 hours before, during, and 24 hours after installation of wood ceiling.

1.5 SCHEDULING

Interior finish work such as plastering, concrete and terrazzo work shall be complete and dry before installation. Mechanical, electrical, and other work above the ceiling line shall be completed and heating, ventilating, and air conditioning systems shall be installed and operating in order to maintain temperature and humidity requirements.

1.6 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a one year period shall be provided. Standard performance guarantee or warranty shall contain an agreement to repair or replace acoustical panels that fail within the warranty period. Failures include, but are not limited to, sagging and warping of panels; rusting and manufacturers defects of grid system.

1.7 QUALITY ASSURANCE

1.7.1 Design Criteria

Manufactured Product shall be installed true and plumb to within manufacturing tolerance of 1/8 inch over 8 feet long.

1.7.2 Product Construction

Wood shall be kiln dried to 10%. Cracking, checking and warpage of members will not be acceptable. Finger joints and composite lamination will not be acceptable.

PART 2 PRODUCTS

2.1 WOOD CEILINGS

2.1.1 Linear Wood Ceiling (WD-1)

Linear Wood Panels. Class A Fire rated with flame spread 20, Smoke developed 25. (Underwriter's Laboratories, Inc. UL#723.)

No fasteners of any kind shall be visible on exposed face surfaces of ceiling panels or support tees. Down light opening and sprinkler holes shall be neatly cut and finished as required.

Use only select grade wood birch in the construction of the linear wood ceilings. The variation in color and grain will occur with each type of wood species and certain ranges of this occurrence should be sampled prior to acceptance as equal materials. Rail lengths shall be (random) not less than 48 inches and maximum of 144 inches. Finished with clear lacquer finish.

2.2 SUSPENSION SYSTEM

Suspension system shall be indirect hung concealed T or and shall conform to ASTM C 635 for intermediate-duty systems. Suspended ceiling framing system shall have the capability to support the finished ceiling, light fixtures, air diffusers, and accessories, as shown. The suspension system shall have a maximum deflection of 1/360 of span length. Seismic details shall conform to the guidance in TI 809-04 and ASTM E 580.

2.3 HANGERS

Hangers and attachment shall support a minimum 300 pound ultimate vertical load without failure of supporting material or attachment.

2.3.1 Wires

Wires shall conform to ASTM A 641, Class 1,0.106 inches in diameter.

2.3.2 Straps

Straps shall be 1 by 3/16 inch galvanized steel conforming to ASTM A 653, with a light commercial zinc coating or ASTM A 366 with an electrodeposited zinc coating conforming to ASTM B 633, Type RS.

2.3.3 Rods

Rods shall be 3/16 inch diameter threaded steel rods, zinc or cadmium coated.

PART 3 EXECUTION

3.1 INSTALLATION

Examine surfaces to receive directly attached wood ceilings units for unevenness, irregularities, and dampness that would affect quality and execution of the work. Interior finish work such as plastering, concrete, and terrazzo work shall be completed and dry before installation. Mechanical, electrical, and other work above the ceiling line shall be completed and approved prior to the start of acoustical ceiling installation. Wood ceilings work shall be provided complete with necessary fastenings, clips, and other accessories required for a complete installation. Mechanical fastenings shall not be exposed in the finished work. Hangers shall be laid out for each individual room or space. Hangers shall be placed to support framing around beams, ducts, columns, grilles, and other penetrations through ceilings. Main runners and carrying channels shall be kept clear of abutting walls and partitions. At least two main runners shall be provided for each ceiling span. Wherever required to bypass an object with the hanger wires, a subsuspension system shall be installed, so that all hanger wires will be plumb. Wood ceiling shall be installed on suspension system with tongue and groove clip.

3.1.1 Suspension System

Suspension system shall be installed in accordance with ASTM C 636 and as specified herein. There shall be no hanger wires or other loads suspended from underside of steel decking.

3.1.1.1 Plumb Hangers

Hangers shall be plumb and shall not press against insulation covering ducts and pipes. Where lighting fixtures are supported from the suspended ceiling system, hangers shall be provided at a minimum of four hangers per fixture and located not more than 6 inches from each corner of each fixture.

3.1.1.2 Splayed Hangers

Where hangers must be splayed (sloped or slanted) around obstructions, the resulting horizontal force shall be offset by bracing, countersplaying, or other acceptable means.

3.2 CLEANING

Following installation, dirty or discolored surfaces of acoustical units shall be cleaned and left free from defects. Units that are damaged or improperly installed shall be removed and new units provided as directed.

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SECTION 09650

RESILIENT FLOORING
11/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 4078	(2002) Water Emulsion Floor Polish
ASTM E 648	(2000) Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
ASTM F 710	(2003) Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
ASTM F 1066	(1999) Vinyl Composition Floor Tile
ASTM F 1303	(2002) Sheet Vinyl Floor Covering with Backing
ASTM F 1482	(2003) Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
ASTM F 1861	(2002) Resilient Wall Base
ASTM F 1869	(1998) Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
ASTM F 2170	(2002) Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs in situ Probes

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)

SCAQMD Rule #1168	(2003) Adhesive and Sealant Applications

1.2 FIRE RESISTANCE REQUIREMENTS

Flooring in corridors and exits shall have a minimum average critical radiant flux of 0.22 watts per square centimeter when tested in accordance with ASTM E 648.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Resilient Flooring and Accessories; G, AO.

Scaled drawings indicating patterns (including location of patterns and colors) and dimensions.

SD-03 Product Data

Resilient Flooring and Accessories.

Manufacturer's descriptive data.

Adhesives.

Manufacturer's descriptive data, documentation stating physical characteristics, and mildew and germicidal characteristics. Material Safety Data Sheets (MSDS) for all primers and adhesives shall be provided to the Contracting Officer. Highlight VOC emissions.

SD-04 Samples

Resilient Flooring and Accessories; G, AE.

Three samples of each indicated color and type of flooring, base, mouldings, and accessories. Sample size shall be minimum 2-1/2 x 4 inches.

SD-06 Test Reports

Moisture, Alkalinity and Bond Tests; G, AO.

Copy of test reports of moisture and alkalinity content of concrete slab, and bond test stating date of test, person conducting the test, and the area tested.

SD-07 Certificates

Regulatory Requirements

Submit report stating that the products contain recycled materials and indicating the actual percentages of post-consumer and/or post-industrial recycled materials by weight.

SD-08 Manufacturer's Instructions

Surface Preparation.
Installation.

Manufacturer's printed installation instructions for all flooring materials and accessories, including preparation of substrate, seaming techniques, and recommended adhesives.

SD-10 Operation and Maintenance Data

Resilient Flooring and Accessories.

Data Package 1 in accordance with Section 01781 OPERATION AND MAINTENANCE DATA.

1.4 DELIVERY AND STORAGE

Materials shall be delivered to the building site in original unopened containers bearing the manufacturer's name, style name, pattern color name and number, production run, project identification, and handling instructions. Materials shall be stored in a clean dry area with temperature maintained above 68 degrees F and below 85 degrees F, and shall be stacked according to manufacturer's recommendations. Materials shall be protected from the direct flow of heat from hot-air registers, radiators and other heating fixtures and appliances. Do not open containers until materials are to be used, except for verification inspection. Observe ventilation and safety procedures specified in the MSDS.

1.5 ENVIRONMENTAL REQUIREMENTS

Areas to receive resilient flooring shall be maintained at a temperature above 68 degrees F and below 85 degrees F for 2 days before application, during application and 2 days after application, unless otherwise directed by the flooring manufacturer for the flooring being installed. A minimum temperature of 55 degrees F shall be maintained thereafter. Observe ventilation and safety procedures specified in the MSDS. Provide adequate ventilation to remove moisture from area and to comply with regulations limiting concentrations of hazardous vapors.

1.6 SCHEDULING

Resilient flooring application shall be scheduled after the completion of other work which would damage the finished surface of the flooring.

1.7 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a one year period shall be provided.

1.8 EXTRA MATERIALS

Extra flooring material of each color and pattern shall be furnished at the rate of5 tiles for each 1000 tiles and 5 square feet for each 1000 square feet of sheet flooring installed. Extra wall base material composed of 20 linear feet of each type, color and pattern shall be furnished. All extra materials shall be packaged in original properly marked containers bearing the manufacturer's name, brand name, pattern color name and number, production run, and handling instructions. Extra materials shall be from the same lot as those installed. Leave extra stock at site in location as directed by Contracting Officer.

1.9 GENERAL REQUIREMENTS

Contractor shall, as much as possible, select materials manufacturers that reduce pollutant and waste, recycle waste, reuse resources and scrap, and reclaim materials instead of disposing into a landfill.

PART 2 PRODUCTS

2.1 VINYL COMPOSITION TILE

Vinyl-composition tile shall conform to ASTM F 1066, Class 2, (through pattern tile), Composition 1, asbestos-free, and shall be 12 inches square and 1/8 inch thick. Tile shall have the color and pattern uniformly distributed throughout the thickness of the tile.

2.2 SHEET VINYL FLOORING

Sheet vinyl flooring shall conform to ASTM F 1303, Type I, Grade 1, Class B-nonfoamed plastic backing (minimum wear layer thickness 0.020 inches and minimum overall thickness 0.080 inches) and shall not be less than 6 feet wide. As required, provide welding rods as recommended by the manufacturer for heat welding of joints.

2.3 WALL BASE

Base shall conform to ASTM F 1861, Type TP (thermoplastic rubber) Style A (straight - installed with carpet), and Style B (coved - installed with resilient flooring). Base shall be 4 inches high and a minimum 1/8 inch thick. Preformed corners in matching height, shape, and color shall be furnished.

2.4 MOULDING

Provide tapered mouldings of rubber and types as recommended by flooring manufacturer for both edges and transitions of flooring materials specified. Vertical lip on moulding shall not be greater than 1/4 inch. Change in level between 1/4 and 1/2 inch shall be beveled with a slope no greater than 1:2.

2.5 ADHESIVES

Adhesives for flooring, base and accessories shall be as recommended by the manufacturer and comply with local indoor air quality standards. VOC content must be less than the current VOC content limits of SCAQMD Rule #1168.

2.6 SURFACE PREPARATION MATERIALS

Surface preparation materials, such as panel type underlayment, lining felt, and floor crack fillers shall be as recommended by the flooring manufacturer for the subfloor conditions. Panel type underlayment products shall comply with ASTM F 1482.

2.7 POLISH/FINISH

Polish shall be as recommended by the manufacturer and conform to ASTM D 4078.

2.8 CAULKING AND SEALANTS

Caulking and sealants shall be in accordance with Section 07920 JOINT SEALANTS.

2.9 MANUFACTURER'S COLOR, PATTERN AND TEXTURE

Color, pattern and texture for resilient flooring and accessories shall be as indicated on the drawings. Color listed is not intended to limit the selection of equal colors from other manufacturers. Floor patterns shall be as specified in the drawings. Flooring in any one continuous area or replacement of damaged flooring in continuous area shall be from same production run with same shade and pattern.

PART 3 EXECUTION

3.1 EXAMINATION/VERIFICATION OF CONDITIONS

The Contractor shall examine and verify that site conditions are in agreement with the design package and shall report all conditions that will prevent a proper installation. The Contractor shall not take any corrective action without written permission from the Government. Work will proceed only when conditions have been corrected and accepted by the installer.

3.2 SURFACE PREPARATION

Flooring shall be in a smooth, true, level plane, except where indicated as sloped. Floor shall be flat to within 3/16 inch in 10 feet. Subfloor shall be prepared in accordance with flooring manufacturers recommended instructions. The surfaces of lightweight concrete slabs (as defined by the flooring manufacturer) shall be prepared as recommended by the flooring manufacturer. Concrete subfloor preparation shall comply with ASTM F 710. Floor fills or toppings may be required as recommended by the flooring manufacturer. Underlayments when required by the flooring manufacturer shall be installed in accordance with manufacturer's recommended installation instructions. Panel type underlayments shall comply with ASTM F 1482. Before any work under this section is begun, all defects such as rough or scaling concrete, chalk and dust, cracks, low spots, high spots, and uneven surfaces shall have been corrected, and all damaged portions of concrete slabs shall have been repaired as recommended by the flooring manufacturer. Concrete curing and sealer compounds, other than the type that does not adversely affect adhesion, shall be entirely removed from the slabs. Paint, varnish, oils, release agents, sealers, waxers, and adhesives shall be removed, as recommended by the flooring manufacturer.

3.3 MOISTURE, ALKALINITY AND BOND TESTS

The suitability of the concrete subfloor for receiving the resilient flooring with regard to moisture content and pH level shall be determined by moisture and alkalinity tests and shall comply with manufacturers recommendations. Moisture testing shall be in accordance with ASTM F 1869 or ASTM F 2170 unless otherwise recommended by the flooring manufacturer. Alkalinity testing shall be as recommended by the flooring manufacturer. The compatibility of the resilient flooring adhesives to the concrete floors shall be determined by a bond test in accordance with the flooring manufacturers recommendations.

3.4 PLACING VINYL-COMPOSITION TILE

Tile flooring and accessories shall be installed in accordance with manufacturer's installation instructions. Adhesives shall be prepared and applied in accordance with manufacturer's directions. Tile lines and joints shall be kept square, symmetrical, tight, and even. Keep each floor in true, level plane, except where slope is indicated. Edge width shall vary as necessary to maintain full-size tiles in the field, but no edge tile shall be less than one-half the field tile size, except where irregular shaped rooms make it impossible. Flooring shall be cut to, and fitted around, all permanent fixtures, built-in furniture and cabinets, pipes, and outlets. Edge tile shall be cut, fitted, and scribed to walls and partitions after field flooring has been applied.

3.5 PLACING SHEET VINYL FLOORING

Sheet vinyl flooring and accessories shall be installed in accordance with manufacturer's installation instructions. Adhesives shall be prepared and applied in accordance with manufacturer's directions. Flooring lines and joints shall be square, symmetrical, tight, and even. Flooring with an integral pattern shall match at seams. Keep each floor in true, level plane, except where slope is indicated. Flooring shall be cut to, and fitted around, all permanent fixtures, built-in furniture and cabinets, pipes, and outlets. Flooring shall be cut, fitted, and scribed to walls and partitions after field flooring has been applied. Seams and edges of sheet vinyl flooring shall be heat welded in accordance with the manufacturer's written installation instructions. Finish joints flush, free from voids, recesses, and raised areas.

3.6 PLACING MOULDING

Provide moulding where flooring termination is higher than the adjacent finished flooring and at transitions between different flooring materials. When required, locate moulding under door centerline. Moulding is not required at doorways where thresholds are provided. Moulding shall be secured with adhesive as recommended by the manufacturer. Adhesives shall be prepared and applied in accordance with manufacturers directions.

3.7 PLACING WALL BASE

Wall base shall be installed in accordance with manufacturer's installation instructions. Adhesives shall be prepared and applied in accordance with manufacturers directions. Base joints shall be tight and base shall be even with adjacent resilient flooring. Voids along the top edge of base at masonry walls shall be filled with caulk. Roll entire vertical surface of base with hand roller, and press toe of base with a straight piece of wood to ensure proper alignment. Avoid excess adhesive in corners. Voids along the top edge of base at masonry walls shall be filled with caulk.

3.8 CLEANING

Immediately upon completion of installation of flooring in a room or an area, flooring and adjacent surfaces shall be dry-cleaned to remove all surplus adhesive. Clean flooring as recommended in accordance with manufacturer's printed maintenance instructions. No sooner than 5 days after installation, flooring shall be washed with a nonalkaline cleaning solution, rinsed thoroughly with clear cold water, and, except for rubber flooring and stair treads, risers and stringers, vinyl and other flooring not requiring polish by manufacturer, given the number of coats of polish

in accordance with manufacturers written instructions. All other flooring shall be cleaned and maintained as recommended by the manufacturer.

3.9 PROTECTION

From the time of laying until acceptance, flooring shall be protected from damage as recommended by the flooring manufacturer. Flooring which becomes damaged, loose, broken, or curled and wall base which is not tight to wall or securely adhered shall be removed and replaced.

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SECTION 09680

CARPET

11/03

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SECTION 09680

CARPET
11/03

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

AATCC 16	(1998) Test Method: Colorfastness to Light
AATCC 134	(2001) Test Method: Electrostatic Propensity of Carpets
AATCC 165	(1999) Test Method: Colorfastness to Crocking: Carpets - AATCC Crockmeter Method
AATCC 174	(1998) Antimicrobial Activity Assessment of Carpet

ASTM INTERNATIONAL (ASTM)

ASTM D 418	(1993) Pile Yarn Floor Covering Construction
ASTM D 1423	(2002) Twist in Yarns by Direct-Counting
ASTM D 3278	(1996e1) Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus
ASTM D 5252	(2001) Practice for the Operation of the Hexapod Tumble Drum Tester
ASTM D 5417	(1999) Practice for Operation of the Vettermann Drum Tester
ASTM D 5793	(1995) Binding Sites Per Unit Length or Width of Pile Yarn Floor Coverings
ASTM D 5848	(1999) Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Coverings
ASTM E 648	(2000) Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source

CARPET AND RUG INSTITUTE (CRI)

CRI 104	(2002) Commercial Carpet Installation

Standard

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

16 CFR 1630	Standard for the Surface Flammability of Carpet and Rugs (FF 1-70)
40 CFR 247	Comprehensive Procurement Guideline for Products Containing Recovered Materials

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 2551	(1981) Machine-made Textile Floor Coverings - Determination of Dimensional Changes Due to the Effect of Varied Water and Heat Conditins (AACHEN Test)

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Installation; G, AO.
Molding; G, AO.

Three copies of drawings indicating areas receiving carpet, carpet types, textures and patterns, direction of pile, location of seams, and locations of edge molding.

SD-03 Product Data

Carpet.

Manufacturer's catalog data and printed documentation stating physical characteristics, durability, resistance to fading, and flame resistance characteristics for each type of carpet material and installation accessory.

Surface Preparation.
Installation.

Three copies of the manufacturer's printed installation instructions for the carpet, including preparation of substrate, seaming techniques, and recommended adhesives and tapes.

Regulatory Requirements.

Three copies of report stating that carpet contains recycled materials and/or involvement in a recycling or reuse program. Report shall include percentage of recycled material.

SD-04 Samples

Carpet; G, AE.

a. Carpet: Two "Production Quality" samples 18 x 18 inches of each carpet proposed for use, showing quality, pattern, and color specified.

SD-06 Test Reports

Moisture and Alkalinity Tests.

Three copies of test reports of moisture and alkalinity content of concrete slab stating date of test, person conducting the test, and the area tested.

SD-07 Certificates

Carpet.

Certificates of compliance from a laboratory accredited by the National Laboratory Accreditation Program of the National Institute of Standards and Technology attesting that each type of carpet and carpet with cushion material conforms to the standards specified.

Regulatory Requirements.

Report stating that the carpet contains recycled materials and indicating the actual percentage of recycled material.

SD-10 Operation and Maintenance Data

Carpet.
Cleaning and Protection.

Three copies of carpet manufacturer's maintenance instructions describing recommended type of cleaning equipment and material, spotting and cleaning methods, and cleaning cycles.

1.3 REGULATORY REQUIREMENTS

Carpet and adhesives shall bear the Carpet and Rug Institute (CRI) Indoor Air Quality (IAQ) label or demonstrate compliance with testing criteria and frequencies through independent laboratory test results. Carpet type bearing the label will indicate that the carpet has been tested and meets the criteria of the CRI IAQ Carpet Testing Program, and minimizes the impact on indoor air quality. Contractor shall procure carpet in accordance with 40 CFR 247. Carpet shall conform to EPA requirements in accordance with Section 01670 RECYCLED / RECOVERED MATERIALS. Where possible, product shall be purchased locally to reduce emissions of fossil fuels from transporting.

1.4 DELIVERY AND STORAGE

Materials shall be delivered to the site in the manufacturer's original wrappings and packages clearly labeled with the manufacturer's name, brand name, size, dye lot number, and related information. Materials shall be stored in a clean, dry, well ventilated area, protected from damage and soiling, and shall be maintained at a temperature above 60 degrees F for 2

days prior to installation.

1.5 ENVIRONMENTAL REQUIREMENTS

Areas in which carpeting is to be installed shall be maintained at a temperature above 60 degrees F for 2 days before installation, during installation, and for 2 days after installation. A minimum temperature of 55 degrees F shall be maintained thereafter for the duration of the contract. Traffic or movement of furniture or equipment in carpeted area shall not be permitted for 24 hours after installation. Other work which would damage the carpet shall be completed prior to installation of carpet.

1.6 WARRANTY

Manufacturer's standard performance guarantees or warranties including minimum ten (10) year wear warranty, two (2) year material and workmanship and ten (10) year tuft bind and delamination.

1.7 EXTRA MATERIAL

Extra material from same dye lot consisting of full width continuous broadloom and uncut carpet tiles shall be provided for future maintenance. A minimum of 2 percent of total square yards of each carpet type, pattern, and color shall be provided.

PART 2 PRODUCTS

2.1 CARPET

Carpet shall be first quality; free of visual blemishes, streaks, poorly dyed areas, fuzzing of pile yarn, spots or stains, and other physical and manufacturing defects. Carpet materials and treatments shall be reasonably nonallergenic and free of other recognized health hazards. All grade carpets shall have a static control construction which gives adequate durability and performance. Carpet shall bear the Carpet and Rug Institute (CRI) Indoor Air Quality (IAQ) Label. Carpet type bearing the label will indicate that carpet has been tested and meets the criteria of the CRI Green Label Requirements for Indoor Air Quality Test Criteria.

2.1.1 Physical Characteristics

2.1.1.1 MODULAR TILE CARPET CP-1

Carpet shall comply with the following:

a. Carpet Construction: Tufted.

b. Type: Modular tile 20 x 20 inches square with 0.15 percent growth/shrink rate in accordance with ISO 2551.

c. Pile Type: Level tip shear.

d. Pile Fiber: Commercial 100% branded (federally registered trademark) nylon continuous filament.

e. Pile or Wire Height: Minimum .15 inch in accordance with ASTM D 418.

f. Yarn Ply: Minimum 2.

g. Gauge or Pitch: Minimum 1/12 inch in accordance with ASTM D 5793.

h. Stitches or Rows/Wires: Minimum 8.66 per square inch.

i. Finished Pile Yarn Weight: Minimum 17 ounces per square yard. This does not include weight of backings. Weight shall be determined in accordance with ASTM D 5848.

j. Pile Density: Minimum 5846.

k. Dye Method: Solution dyed.

l. Backing Materials: Primary backing materials shall be those customarily used and accepted by the trade for each type of carpet. Secondary backing to suit project requirements shall be those customarily used and accepted by the trade for each type of carpet, except when a special unitary back designed for gluedown is provided.

m. Recycle Efforts: Use of nylon carpet with backing containing recycled content.

2.1.1.2 MODULAR TILE CARPETCP-3, CP-4, CP-5, CP-6

Carpet shall comply with the following:

a. Carpet Construction: Tufted

b. Type: Modular tile 20 x 20 inches square with 0.15 percent growth/shrink rate in accordance with ISO 2551.

c. Pile Type: Level-loop.

d. Pile Fiber: Commercial 100% branded (federally registered trademark) nylon continuous filament.

e. Pile or Wire Height: Minimum .18 inch in accordance with ASTM D 418.

f. Pile Density: Minimum 7,116.

g. Dye Method: Solution dyed.

h. Backing Materials: Primary backing materials shall be those customarily used and accepted by the trade for each type of carpet. Secondary backing to suit project requirements shall be those customarily used and accepted by the trade for each type of carpet, except when a special unitary back designed for gluedown is provided.

i. Recycle Efforts: Use of nylon carpet with backing containing recycled content.

2.1.1.3 BROADLOOM CARPETCP-2

Carpet shall comply with the following:

a. Carpet Construction: Tufted.

b. Type: Broadloom 12 feet minimum usable carpet width

c. Pile Type: Level-loop.

d. Pile Fiber: Commercial 100% branded (federally registered trademark) nylon continuous filament.

e. Pile or Wire Height: Minimum .11 inch in accordance with ASTM D 418.

f. Yarn Ply: Minimum 2 in accordance with ASTM D 1423.

g. Gauge or Pitch: Minimum 1/12 inch in accordance with ASTM D 5793.

h. Stitches or Rows/Wires: Minimum 11 per square inch.

i. Finished Pile Yarn Weight: Minimum 26 ounces per square yard. This does not include weight of backings. Weight shall be determined in accordance with ASTM D 5848.

j. Pile Density: Minimum 8069.

k. Dye Method: Solution dyed and Space dye.

l. Backing Materials: Primary backing materials shall be polypropylene. Secondary backing to suit project requirements shall be those customarily used and accepted by the trade for each type of carpet, except when a special unitary back designed for gluedown is provided.

m. Recycle Efforts: Use of nylon carpet with backing containing recycled content.

2.1.1.4 ENTRANCE CARPET CP-7

Carpet shall comply with the following:

a. Carpet Construction: Tufted.

b. Type: Entrance 18 x 18 inches square mat size.

c. Pile Type: Cut pile.

d. Pile Fiber: Commercial 100% branded (federally registered trademark).

e. Pile or Wire Height: Minimum 0.237 inch in accordance with ASTM D 418.

f. Yarn Ply: Minimum 2.

g. Gauge or Pitch: Minimum 5/32 inch in accordance with ASTM D 5793.

h. Stitches or Rows/Wires: Minimum 5.59 per square inch.

i. Finished Pile Yarn Weight: Minimum 27 ounces per square yard. This does not include weight of backings. Weight shall be determined in accordance with ASTM D 5848.

j. Pile Density: Minimum 4101.

k. Dye Method: Yarn (or Skein) dyed.

l. Backing Materials: Primary backing materials shall be hardback. Secondary backing to suit project requirements shall be those customarily used and accepted by the trade for each type of carpet, except when a special unitary back designed for gluedown is provided.

m. Recycle Efforts: Use of nylon carpet with backing containing recycled content.

2.2 Performance Requirements

a. ARR (Appearance Retention Rating): Carpet shall be tested and have the minimum 3.0-3.5 (Heavy)ARR when tested in accordance with either the ASTM D 5252(Hexapod) or ASTM D 5417 (Vettermann) test methods using the number of cycles for short and long term tests as specified.

b. Static Control: Static control shall be provided to permanently control static buildup to less than 3.5 kV when tested at 20 percent relative humidity and 70 degrees F in accordance with AATCC 134.

c. Flammability and Critical Radiant Flux Requirements: Carpet shall comply with 16 CFR 1630. Carpet in corridors and exits shall have a minimum average critical radiant flux of 0.45 watts per square centimeter when tested in accordance with ASTM E 648.

d. Tuft Bind: Tuft bind force required to pull a tuft or loop free from carpet backing shall be a minimum 10 pound average force for loop pile.

e. Colorfastness to Crocking: Dry and wet crocking shall comply with AATCC 165 and shall have a Class 4 minimum rating on the AATCC Color Transference Chart for all colors.

f. Colorfastness to Light: Colorfastness to light shall comply with AATCC 16, Test Option E "Water-Cooled Xenon-Arc Lamp, Continuous Light" and shall have a minimum 4 grey scale rating after 40 hours.

g. Delamination Strength: Delamination strength for tufted carpet with a secondary back shall be minimum of 2.5 lbs./inch.

h. Antimicrobial: Nontoxic antimicrobial treatment in accordance with AATCC 174 Part I (qualitatiave), guaranteed by the carpet manufacturer to last the life of the carpet.

2.3 ADHESIVES AND CONCRETE PRIMER

Adhesives and concrete primers for installation of carpet shall be waterproof, nonflammable, meet local air-quality standards, and shall be as required by the carpet manufacturer. Seam adhesive shall be waterproof, nonflammable, and nonstaining as recommended by the carpet manufacturer. Release adhesive for modular tile carpet shall be as recommended by the

carpet manufacturer. Adhesives flashpoint shall be minimum 140 degrees F in accordance with ASTM D 3278.

2.4 TAPE

Tape for seams shall be as recommended by the carpet manufacturer for the type of seam used in installation.

2.5 COLOR, TEXTURE, AND PATTERN

Color, texture, and pattern shall be as shown on the drawings.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Carpet shall not be installed on surfaces that are unsuitable and will prevent a proper installation. Holes, cracks, depressions, or rough areas shall be repaired using material recommended by the carpet or adhesive manufacturer. Floor shall be free of any foreign materials and swept broom clean. Before beginning work, subfloor shall be tested with glue and carpet to determine "open time" and bond.

3.2 MOISTURE AND ALKALINITY TESTS

Concrete slab shall be tested for moisture content and excessive alkalinity in accordance with CRI 104.

3.3 PREPARATION OF CONCRETE SUBFLOOR

Installation of the carpeting shall not commence until concrete substrate is at least 90 days old. The concrete surfaces shall be prepared in accordance with instructions of the carpet manufacturer. Type of concrete sealer, when required, shall be compatible with the carpet.

3.4 INSTALLATION

All work shall be performed by installers who are CFI certified (International Certified Floorcovering Installer Association), or manufacturer's approved installers. Installation shall be in accordance with the manufacturer's instructions and CRI 104. Edges of carpet meeting hard surface flooring shall be protected with molding; installation shall be in accordance with the molding manufacturer's instructions. Ventilation, personal protection, and other safety precautions recommended by the manufacturer of the adhesive shall be followed. Ventilation ahall continue for at least 72 hours following installation.

3.4.1 Broadloom Installation

Broadloom carpet shall be installed direct glue down and shall be smooth, uniform, and secure, with a minimum of seams. Seams shall be regular, unnoticeable, and treated with a seam adhesive. Side seams shall be run toward the light where practical and where such layout does not increase the number of seams. Breadths shall be installed parallel, with carpet pile in the same direction. Patterns shall be accurately matched. Cutouts, as at door jambs, columns and ducts shall be neatly cut and fitted securely. Seams at doorways shall be located parallel to and centered directly under doors. Seams shall not be made perpendicular to doors or at pivot points. Seams at changes in directions of corridors shall follow the

wall line parallel to the carpet direction. Corridors with widths less than 6 feet shall have the carpet laid lengthwise down the corridors.

3.4.2 Modular Tile Installation

Modular tiles shall be installed with release adhesive and shall be snugly jointed together. Tiles shall be laid in an alternating pattern with accessibility to the subfloor where required.

3.4.3 Entrance Carpet Installation

Tiles shall be installed with release adhesive and shall be snugly jointed together. Tiles shall be laid in the same direction.

3.5 CLEANING AND PROTECTION

3.5.1 Cleaning

After installation of the carpet, debris, scraps, and other foreign matter shall be removed. Soiled spots and adhesive shall be removed from the face of the carpet with appropriate spot remover. Protruding face yarn shall be cut off and removed. Carpet shall be vacuumed clean.

3.5.2 Protection

The installed carpet shall be protected from soiling and damage with heavy, reinforced, nonstaining kraft paper, plywood, or hardboard sheets. Edges of kraft paper protection shall be lapped and secured to provide a continuous cover. Traffic shall be restricted for at least 45 hours. Protective covering shall be removed when directed by the Contracting Officer.

3.6 REMNANTS

Remnants remaining from the installation, consisting of scrap pieces more than 2 feet in dimension with more than 6 square feet total, shall be provided. Non-retained scraps shall be removed from site and recycled appropriately.

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DIVISION 09 - FINISHES

SECTION 09900

PAINTS AND COATINGS

02/02

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SECTION 09900

PAINTS AND COATINGS
02/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH 0100Doc	(2001) Documentation of the Threshold Limit Values and Biological Exposure Indices

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 235	Standard Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)
ASTM D 523	(1999) Standard Test Method for Specular Gloss
ASTM D 2092	(1995) Preparation of Zinc-Coated (Galvanized) Steel Surfaces for Painting
ASTM D 4263	(1983; R 1999) Indicating Moisture in Concrete by the Plastic Sheet Method
ASTM D 4444	(1998) Standard Test Methods for Use and Calibration of Hand-Held Moisture Meters
ASTM F 1869	(1998) Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910.1000	Air Contaminants

MASTER PAINTERS INSTITUTE (MPI)

MPI 2	(2001) Aluminum Heat Resistant Enamel (up to 427 C and 800 F)
MPI 107	(Jan 2004) Rust Inhibitive Primer (Water-Based)
MPI 11	(2001) Exterior Latex, Semi-Gloss
MPI 19	(2001) Inorganic Zinc Primer

MPI 21	(2001)Heat Resistant Enamel, Gloss, (Up to 205 C or 400 F)
MPI 23	(2001) Surface Tolerant Metal Primer
MPI 26	(2001) Cementitious Galvanized Metal Primer
MPI 47	(2001) Interior Alkyd, Semi-Gloss
MPI 50	(2001) Interior Latex Primer Sealer
MPI 54	(2001) Interior Latex, Semi-Gloss
MPI 57	(2001) Interior Oil Modified Clear Urethane, Satin
MPI 72	(2001) Polyurethane, Two Component, Pigmented, Gloss
MPI 78	(2001) Two Component Aliphatic Polyurethane, Clear
MPI 79	(2001) Marine Alkyd Metal Primer
MPI 94	(2001) Exterior Alkyd, Semi-Gloss
MPI 95	(2001) Fast Drying Metal Primer
MPI 101	(2001) Cold Curing Epoxy Primer
MPI 104	Interior/Exterior Concrete Floor Sealer (Solvent Based)
MPI 141	(2001) High Performance Semigloss Latex, White and Tints - Gloss Level 5

SCIENTIFIC CERTIFICATION SYSTEMS (SCS)

SCS SP01-01	(2000) Environmentally Preferable Product Specification for Architectural and Anti-Corrosive Paints

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC PA 1	(2000) Shop, Field, and Maintenance Painting
SSPC QP 1	(1989) Evaluating Qualifications of Painting Contractors (Field Application to Complex Structures)
SSPC VIS 1	(1989) Visual Standard for Abrasive Blast Cleaned Steel (Standard Reference Photographs)
SSPC VIS 3	(1993) Visual Standard for Power-and Hand-Tool Cleaned Steel
SSPC VIS 4	(2001) Guide and Reference Photographs for

	Steel Surfaces Prepared by Waterjetting
SSPC SP 1	(1982) Solvent Cleaning
SSPC SP 2	(1995) Hand Tool Cleaning
SSPC SP 3	(1995) Power Tool Cleaning
SSPC SP 6	(1994) Commercial Blast Cleaning
SSPC SP 7	(1994) Brush-Off Blast Cleaning
SSPC SP 10	(1994) Near-White Blast Cleaning
SSPC SP 12	(1995) Surface Preparation and Cleaning of Steel and Other Hard Materials by High-and Ultra high-Pressure Water Jetting Prior to Recoating
SSPC Guide 3	(1982; R 1995) A Guide to Safety in Paint Application

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FED-STD-313	(Rev D; Am 1) Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

The current MPI, "Approved Product List" which lists paint by brand, label, product name and product code as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use a subsequent MPI "Approved Product List", however, only one list may be used for the entire contract and each coating system is to be from a single manufacturer. All coats on a particular substrate must be from a single manufacturer. No variation from the MPI Approved Products List is acceptable.

Samples of specified materials may be taken and tested for compliance with specification requirements.

In keeping with the intent of Executive Order 13101, "Greening the Government through Waste Prevention, Recycling, and Federal Acquisition", products certified by SCS as meeting SCS SP01-01 shall be given preferential consideration over registered products. Products that are registered shall be given preferential consideration over products not carrying any EPP designation.

SD-02 Shop Drawings

Piping identification.

Submit color stencil codes

SD-03 Product Data

Coating.

Manufacturer's Technical Data Sheets.

SD-04 Samples

Color; G-AE.

Submit manufacturer's samples of paint colors. Cross reference color samples to color scheme as indicated.

SD-07 Certificates

Applicator's qualifications.

Qualification Testing laboratory for coatings.

Coating.

Submit report stating coatings meet VOC limits of Green Seal - 11.

SD-08 Manufacturer's Instructions

Application instructions.

Mixing.

Detailed mixing instructions, minimum and maximum application temperature and humidity, potlife, and curing and drying times between coats.

Manufacturer's Material Safety Data Sheets

Submit manufacturer's Material Safety Data Sheets for coatings, solvents, and other potentially hazardous materials, as defined in FED-STD-313.

SD-10 Operation and Maintenance Data

Coatings.

Preprinted cleaning and maintenance instructions for all coating systems shall be provided.

1.3 APPLICATOR'S QUALIFICATIONS

1.3.1 SSPC QP 1 Certification

All contractors and subcontractors that perform surface preparation or coating application shall be certified by the Society for Protective Coatings (formerly Steel Structures Painting Council) (SSPC) to the

requirements of SSPC QP 1 prior to contract award, and shall remain certified while accomplishing any surface preparation or coating application. The painting contractors and painting subcontractors must remain so certified for the duration of the project. If a contractor's or subcontractor's certification expires, the firm will not be allowed to perform any work until the certification is reissued. Requests for extension of time for any delay to the completion of the project due to an inactive certification will not be considered and liquidated damages will apply. Notify the Contracting Officer of any change in contractor certification status.

1.4 QUALITY ASSURANCE

1.4.1 Field Samples and Tests

The Contracting Officer may choose up to two coatings that have been delivered to the site to be tested at no cost to the Government. Take samples of each chosen product as specified in the paragraph "Sampling Procedures." Test each chosen product as specified in the paragraph "Testing Procedure." Products which do not conform, shall be removed from the job site and replaced with new products that confrom to the referenced specification. Testing of replacement products that failed initial testing shall be at no cost to the Government.

1.4.1.1 1.4.1.1 Sampling Procedure

The Contracting Officer will select paint at random from the products that have been delivered to the job site for sample testing. The Contractor shall provide one quart samples of the selected paint materials. The samples shall be taken in the presence of the Contracting Officer, and labeled, identifying each sample. Provide labels in accordance with the paragraph "Packaging, Labeling, and Storage" of this specification.

1.4.1.2 Testing Procedure

Provide Batch Quality Conformance Testing for specified products, as defined by and performed by MPI. As an alternative to Batch Quality Conformance Testing, the Contractor may provide Qualification Testing for specified products above to the appropriate MPI product specification, using the third-party laboratory approved under the paragraph "Qualification Testing" laboratory for coatings. The qualification testing lab report shall include the backup data and summary of the test results. The summary shall list all of the reference specification requirements and the result of each test. The summary shall clearly indicate whether the tested paint meets each test requirement. Note that Qualification Testing may take 4 to 6 weeks to perform, due to the extent of testing required.

Submit name, address, telephone number, FAX number, and e-mail address of the independent third party laboratory selected to perform testing of coating samples for compliance with specification requirements. Submit documentation that laboratory is regularly engaged in testing of paint samples for conformance with specifications, and that employees performing testing are qualified. If the Contractor chooses MPI to perform the Batch Quality Conformance testing, the above submittal information is not required, only a letter is required from the Contractor stating that MPI will perform the testing.

1.5 REGULATORY REQUIREMENTS

1.5.1 Environmental Protection

In addition to requirements specified elsewhere for environmental protection, provide coating materials that conform to the restrictions of the local Air Pollution Control District and regional jurisdiction. Notify Contracting Officer of any paint specified herein which fails to conform.

1.5.2 Lead Content

Do not use coatings having a lead content over 0.06 percent by weight of nonvolatile content.

1.5.3 Chromate Content

Do not use coatings containing zinc-chromate or strontium-chromate.

1.5.4 Asbestos Content

Materials shall not contain asbestos.

1.5.5 Mercury Content

Materials shall not contain mercury or mercury compounds.

1.5.6 Silica

Abrasive blast media shall not contain free crystilline silica.

1.5.7 Human Carcinogens

Materials shall not contain ACGIH 0100Doc and ACGIH 0100Doc confirmed human carcinogens (A1) or suspected human carcinogens (A2).

1.5.8 Volatile Organic Compounds

Paints and coatings must meet the VOC and chemical component limits of Green Seal requirements.

1.6 PACKAGING, LABELING, AND STORAGE

Paints shall be in sealed containers that legibly show the contract specification number, designation name, formula or specification number, batch number, color, quantity, date of manufacture, manufacturer's formulation number, manufacturer's directions including any warnings and special precautions, and name and address of manufacturer. Pigmented paints shall be furnished in containers not larger than 5 gallons. Paints and thinners shall be stored in accordance with the manufacturer's written directions, and as a minimum, stored off the ground, under cover, with sufficient ventilation to prevent the buildup of flammable vapors, and at temperatures between 40 to 95 degrees F.

1.7 SAFETY AND HEALTH

Apply coating materials using safety methods and equipment in accordance with the following:

Work shall comply with applicable Federal, State, and local laws and regulations, and with the ACCIDENT PREVENTION PLAN, including the Activity Hazard Analysis as specified in Section 01525,"Safety Requirements" and in Appendix A of EM 385-1-1. The Activity Hazard Analysis shall include analyses of the potential impact of painting operations on painting personnel and on others involved in and adjacent to the work zone.

1.7.1 Safety Methods Used During Coating Application

Comply with the requirements of SSPC Guide 3.

1.7.2 Toxic Materials

To protect personnel from overexposure to toxic materials, conform to the most stringent guidance of:

a. The applicable manufacturer's Material Safety Data Sheets (MSDS) or local regulation.

b. 29 CFR 1910.1000.

c. ACGIH 0100Doc, threshold limit values.

1.8 ENVIRONMENTAL CONDITIONS

1.8.1 Coatings

Do not apply coating when air or substrate conditions are:

a. Less than 5 degrees F above dew point;

b. Below 50 degrees F or over 95 degrees F, unless specifically pre-approved by the Contracting Officer and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.

1.9 COLOR SELECTION

Colors of finish coats shall be as indicated or specified. Where not indicated or specified, colors shall be selected by the Contracting Officer. Manufacturers' names and color identification are used for the purpose of color identification only. Named products are acceptable for use only if they conform to specified requirements. Products of other manufacturers are acceptable if the colors approximate colors indicated and the product conforms to specified requirements.

Tint each coat progressively darker to enable confirmation of the number of coats.

Color, texture, and pattern of wall coating systems shall be as indicated on the drawings.

1.10 LOCATION AND SURFACE TYPE TO BE PAINTED

1.10.1 Painting Included

Where a space or surface is indicated to be painted, include the following

unless indicated otherwise.

a. Surfaces behind portable objects and surface mounted articles readily detachable by removal of fasteners, such as screws and bolts.

b. New factory finished surfaces that require identification or color coding and factory finished surfaces that are damaged during performance of the work.

c. Existing coated surfaces that are damaged during performance of the work.

1.10.1.1 Exterior Painting

Includes new surfaces of the building and appurtenances as indicated. Also included are existing coated surfaces made bare by cleaning operations.

1.10.1.2 Interior Painting

Includes new surfaces of the building and appurtenances as indicated and existing coated surfaces made bare by cleaning operations. Where a space or surface is indicated to be painted, include the following items, unless indicated otherwise.

a. Exposed columns, girders, beams, joists, and metal deck; and

b. Other contiguous surfaces.

1.10.2 Painting Excluded

Do not paint the following unless indicated otherwise.

a. Surfaces concealed and made inaccessible by panelboards, fixed ductwork, machinery, and equipment fixed in place.

b. Surfaces in concealed spaces. Concealed spaces are defined as enclosed spaces above suspended ceilings, furred spaces, attic spaces, crawl spaces, elevator shafts and chases.

c. Steel to be embedded in concrete.

d. Copper, stainless steel, aluminum, brass, and lead except existing coated surfaces.

e. Hardware, fittings, and other factory finished items.

1.10.3 Mechanical and Electrical Painting

Includes field coating of interior and exterior new surfaces.

a. Where a space or surface is indicated to be painted, include the following items unless indicated otherwise.

(1) Exposed piping, conduit, and ductwork;

(2) Supports, hangers, air grilles, and registers;

(3) Miscellaneous metalwork and insulation coverings.

b. Do not paint the following, unless indicated otherwise:

(1) New zinc-coated, aluminum, and copper surfaces under insulation

(2) New aluminum jacket on piping

(3) New interior ferrous piping under insulation.

1.10.3.1 Fire Extinguishing Sprinkler Systems

Clean, pretreat, prime, and paint new fire extinguishing sprinkler systems including valves, piping, conduit, hangers, supports, miscellaneous metalwork, and accessories. Apply coatings to clean, dry surfaces, using clean brushes. Clean the surfaces to remove dust, dirt, rust, and loose mill scale. Immediately after cleaning, provide the metal surfaces with one coat primer per schedules. Shield sprinkler heads with protective covering while painting is in progress. Upon completion of painting, remove protective covering from sprinkler heads. Remove sprinkler heads which have been painted and replace with new sprinkler heads. Provide primed surfaces with the following:

a. Piping in Unfinished Areas: Provide primed surfaces with one coat of red alkyd gloss enamel applied to a minimum dry film thickness of 1.0 mil in attic spaces, spaces above suspended ceilings, crawl spaces, pipe chases, mechanical equipment room, and spaces where walls or ceiling are not painted or not constructed of a prefinished material.

b. Piping in Finished Areas: Provide primed surfaces with two coats of paint to match adjacent surfaces, except provide valves and operating accessories with one coat of red alkyd gloss enamel applied to a minimum dry film thickness of 1.0 mil. Provide piping with 2 inch wide red enamel bands or self-adhering red plastic bands spaced at maximum of 20 foot intervals throughout the piping systems.

1.10.4 Definitions and Abbreviations

1.10.4.1 Qualification Testing

Qualification testing is the performance of all test requirements listed in the product specification. This testing is accomplished by MPI to qualify each product for the MPI Approved Product List, and may also be accomplished by Contractor's third party testing lab if an alternative to Batch Quality Conformance Testing by MPI is desired.

1.10.4.2 Batch Quality Conformance Testing

Batch quality conformance testing determines that the product provided is the same as the product qualified to the appropriate product specification. This testing shall only be accomplished by MPI testing lab.

1.10.4.3 Coating

A film or thin layer applied to a base material called a substrate. A coating may be a metal, alloy, paint, or solid/liquid suspensions on various substrates (metals, plastics, wood, paper, leather, cloth, etc.).

They may be applied by electrolysis, vapor deposition, vacuum, or mechanical means such as brushing, spraying, calendering, and roller coating. A coating may be applied for aesthetic or protective purposes or both. The term "coating" as used herein includes emulsions, enamels, stains, varnishes, sealers, epoxies, and other coatings, whether used as primer, intermediate, or finish coat. The terms paint and coating are used interchangeably.

1.10.4.4 DFT or dft

Dry film thickness, the film thickness of the fully cured, dry paint or coating.

1.10.4.5 DSD

Degree of Surface Degradation, the MPI system of defining degree of surface degradation. Five (5) levels are generically defined under the Assessment sections in the MPI Maintenance Repainting Manual.

1.10.4.6 EPP

Environmentally Preferred Products, a standard for determining environmental preferability in support of Executive Order 13101.

1.10.4.7 EXT

MPI short term designation for an exterior coating system.

1.10.4.8 INT

MPI short term designation for an interior coating system.

1.10.4.9 micron / microns

The metric measurement for 0.001 mm or one/one-thousandth of a millimeter.

1.10.4.10 mil / mils

The English measurement for 0.001 in or one/one-thousandth of an inch, equal to 25.4 microns or 0.0254 mm.

1.10.4.11 mm

The metric measurement for millimeter, 0.001 meter or one/one-thousandth of a meter.

1.10.4.12 MPI Gloss Levels

MPI system of defining gloss. Seven (7) gloss levels (G1 to G7) are generically defined under the Evaluation sections of the MPI Manuals. Traditionally, Flat refers to G1/G2, Eggshell refers to G3, Semigloss refers to G5, and Gloss refers to G6.

Gloss levels are defined by MPI as follows:

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte or Flat	0 to 5	10 max

G2	Velvet	0 to 10	10 to 35
G3	Eggshell	10 to 25	10 to 35
G4	Satin	20 to 35	35 min
G5	Semi-Gloss	35 to 70	
G6	Gloss	70 to 85	
G7	High Gloss		

Gloss is tested in accordance with ASTM D 523. Historically, the Government has used Flat (G1 / G2), Eggshell (G3), Semi-Gloss (G5), and Gloss (G6).

1.10.4.13 MPI System Number

The MPI coating system number in each Division found in either the MPI Architectural Painting Specification Manual or the Maintenance Repainting Manual and defined as an exterior (EXT/REX) or interior system (INT/RIN). The Division number follows the CSI Master Format.

1.10.4.14 Paint

See Coating definition.

1.10.4.15 REX

MPI short term designation for an exterior coating system used in repainting projects or over existing coating systems.

1.10.4.16 RIN

MPI short term designation for an interior coating system used in repainting projects or over existing coating systems.

PART 2 PRODUCTS

2.1 MATERIALS

Conform to the coating specifications and standards referenced in PART 3. Submit manufacturer's technical data sheets for specified coatings and solvents.

PART 3 EXECUTION

3.1 PROTECTION OF AREAS AND SPACES NOT TO BE PAINTED

Prior to surface preparation and coating applications, remove, mask, or otherwise protect, hardware, hardware accessories, machined surfaces, radiator covers, plates, lighting fixtures, public and private property, and other such items not to be coated that are in contact with surfaces to be coated. Following completion of painting, workmen skilled in the trades involved shall reinstall removed items. Restore surfaces contaminated by coating materials, to original condition and repair damaged items.

3.2 SURFACE PREPARATION

Remove dirt, splinters, loose particles, grease, oil, and other foreign matter and substances deleterious to coating performance as specified for each substrate before application of paint or surface treatments. Oil and grease shall be removed prior to mechanical cleaning. Cleaning shall be programmed so that dust and other contaminants will not fall on wet, newly

painted surfaces. Exposed ferrous metals such as nail heads on or in contact with surfaces to be painted with water-thinned paints, shall be spot-primmed with a suitable corrosion-inhibitive primer capable of preventing flash rusting and compatible with the coating specified for the adjacent areas.

3.3 PREPARATION OF METAL SURFACES

3.3.1 New Ferrous Surfaces

a. Ferrous Surfaces including Shop-coated Surfaces and Small Areas That Contain Rust, Mill Scale and Other Foreign Substances: Solvent clean or detergent wash in accordance with SSPC SP 1 to remove oil and grease. Where shop coat is missing or damaged, clean according to SSPC SP 2 Shop-coated ferrous surfaces shall be protected from corrosion by treating and touching up corroded areas immediately upon detection.

b. Surfaces With More Than 20 Percent Rust, Mill Scale, and Other Foreign Substances: Clean entire surface in accordance with SSPC SP 6/SSPC SP 12 WJ-3

c. Exterior Ferrous Columns and Trellis: Clean according to SSPC SP 6.

3.3.2 Final Ferrous Surface Condition:

For tool cleaned surfaces, the requirements are stated in SSPC SP 2 and SSPC SP 3. As a visual reference, cleaned surfaces shall be similar to photographs in SSPC VIS 3.

For abrasive blast cleaned surfaces, the requirements are stated in SSPC SP 7, SSPC SP 6, and SSPC SP 10. As a visual reference, cleaned surfaces shall be similar to photographs in SSPC VIS 1.

For waterjet cleaned surfaces, the requirements are stated in SSPC SP 12. As a visual reference, cleaned surfaces shall be similar to photographs in SSPC VIS 4.

3.3.3 Galvanized Surfaces

a. New or Existing Galvanized Surfaces With Only Dirt and Zinc Oxidation Products: Clean with solvent, steam, or non-alkaline detergent solution in accordance with SSPC SP 1. If the galvanized metal has been passivated or stabilized, the coating shall be completely removed by brush-off abrasive blast. New galvanized steel to be coated shall not be "passivated" or "stabilized" If the absence of hexavalent stain inhibitors is not documented, test as described in ASTM D 2092, Appendix X2, and remove by one of the methods described therein.

b. Galvanized with Slight Coating Deterioration or with Little or No Rusting: Water jetting to SSPC SP 12 WJ3 to remove loose coating from surfaces with less than 20 percent coating deterioration and no blistering, peeling, or cracking. Use inhibitor as recommended by the coating manufacturer to prevent rusting.

3.3.4 Non-Ferrous Metallic Surfaces

Aluminum and aluminum-alloy, lead, copper, and other nonferrous metal surfaces.

a. Surface Cleaning: Solvent clean in accordance with SSPC SP 1 and wash with mild non-alkaline detergent to remove dirt and water soluble contaminants.

3.3.5 Terne-Coated Metal Surfaces

Solvent clean surfaces with mineral spirits, ASTM D 235. Wipe dry with clean, dry cloths.

3.4 PREPARATION OF CONCRETE AND CEMENTITIOUS SURFACE

3.4.1 Concrete and Masonry

a. Curing: Concrete, stucco and masonry surfaces shall be allowed to cure at least 30 days before painting, except concrete slab on grade, which shall be allowed to cure 90 days before painting.

b. Surface Cleaning: Remove the following deleterious substances.

(1) Dirt, Grease, and Oil: Wash new surfaces with a solution composed of 1/2 cup trisodium phosphate, 1/4 cuphousehold detergent, and 4 quarts of warm water. Then rinse thoroughly with fresh water. For large areas, water blasting may be used.

(2) Fungus and Mold: Wash new surfaces with a solution composed of 1/2 cup trisodium phosphate, 1/4 cup household detergent, 1 quart 5 percent sodium hypochlorite solution and 3 quarts of warm water. Rinse thoroughly with fresh water.

(3) Paint and Loose Particles: Remove by wire brushing.

(4) Efflorescence: Remove by scraping or wire brushing followed by washing with a 5 to 10 percent by weight aqueous solution of hydrochloric (muriatic) acid. Do not allow acid to remain on the surface for more than five minutes before rinsing with fresh water. Do not acid clean more than 4 square feet of surface, per workman, at one time.

a. Cosmetic Repair of Minor Defects: Repair or fill mortar joints and minor defects, including but not limited to spalls, in accordance with manufacturer's recommendations and prior to coating application.

b. Allowable Moisture Content: Latex coatings may be applied to damp surfaces, but not to surfaces with droplets of water. Do not apply epoxies to damp vertical surfaces as determined by ASTM D 4263 or horizontal surfaces that exceed 3 lbs of moisture per 1000 square feet in 24 hours as determined by ASTM F 1869. In all cases follow manufacturers recommendations. Allow surfaces to cure a minimum of 30 days before painting.

3.4.2 Gypsum Board, Plaster, and Stucco

a. Surface Cleaning: Plaster and stucco shall be clean and free from

loose matter; gypsum board shall be dry. Remove loose dirt and dust by brushing with a soft brush, rubbing with a dry cloth, or vacuum-cleaning prior to application of the first coat material. A damp cloth or sponge may be used if paint will be water-based.

b. Repair of Minor Defects: Prior to painting, repair joints, cracks, holes, surface irregularities, and other minor defects with patching plaster or spackling compound and sand smooth.

c. Allowable Moisture Content: Latex coatings may be applied to damp surfaces, but not surfaces with droplets of water. Do not apply epoxies to damp surfaces as determined by ASTM D 4263. New plaster to be coated shall have a maximum moisture content of 8 percent, when measured in accordance with ASTM D 4444, Method A, unless otherwise authorized. In addition to moisture content requirements, allow new plaster to age a minimum of 30 days before preparation for painting.

3.5 PREPARATION OF WOOD AND PLYWOOD SURFACES

3.5.1 New Plywood and Wood Surfaces, Except Floors:

a. Wood surfaces shall be cleaned of foreign matter.

Surface Cleaning: Surfaces shall be free from dust and other deleterious substances and in a condition approved by the Contracting Officer prior to receiving paint or other finish. Do not use water to clean uncoated wood.

b. Moisture content of the wood shall not exceed 12 percent as measured by a moisture meter in accordance with ASTM D 4444, Method A, unless otherwise authorized.

c. Wood surfaces adjacent to surfaces to receive water-thinned paints shall be primed and/or touched up before applying water-thinned paints.

d. Cracks and Nailheads: Set and putty stop nailheads and putty cracks after the prime coat has dried.

e. Cosmetic Repair of Minor Defects:

(1) Knots and Resinous Wood and Fire, Smoke, Water, and Color Marker Stained Existing Coated Surface: Prior to application of coating, cover knots and stains with two or more coats of 3-pound-cut shellac varnish, plasticized with 5 ounces of castor oil per gallon. Scrape away existing coatings from knotty areas, and sand before treating. Prime before applying any putty over shellacked area.

(2) Open Joints and Other Openings: Fill with whiting putty, linseed oil putty. Sand smooth after putty has dried.

(3) Checking: Where checking of the wood is present, sand the surface, wipe and apply a coat of pigmented orange shellac. Allow to dry before paint is applied.

f. Prime Coat For New Exterior Surfaces: Prime coat wood doors, windows, frames, and trim before wood becomes dirty, warped, or

weathered.

3.5.2 Interior Wood Surfaces, Stain Finish

Interior wood surfaces to receive stain shall be sanded. Oak and other open-grain wood to receive stain shall be given a coat of wood filler not less than 8 hours before the application of stain; excess filler shall be removed and the surface sanded smooth.

3.6 APPLICATION

3.6.1 Coating Application

Painting practices shall comply with applicable federal, state and local laws enacted to insure compliance with Federal Clean Air Standards. Apply coating materials in accordance with SSPC PA 1. SSPC PA 1 methods are applicable to all substrates, except as modified herein.

At the time of application, paint shall show no signs of deterioration. Uniform suspension of pigments shall be maintained during application.

Unless otherwise specified or recommended by the paint manufacturer, paint may be applied by brush, roller, or spray. Rollers for applying paints and enamels shall be of a type designed for the coating to be applied and the surface to be coated.

Paints, except water-thinned types, shall be applied only to surfaces that are completely free of moisture as determined by sight or touch.

Thoroughly work coating materials into joints, crevices, and open spaces. Special attention shall be given to insure that all edges, corners, crevices, welds, and rivets receive a film thickness equal to that of adjacent painted surfaces.

Each coat of paint shall be applied so dry film shall be of uniform thickness and free from runs, drops, ridges, waves, pinholes or other voids, laps, brush marks, and variations in color, texture, and finish. Hiding shall be complete.

Touch up damaged coatings before applying subsequent coats. Interior areas shall be broom clean and dust free before and during the application of coating material.

Apply paint to new fire extinguishing sprinkler systems including valves, piping, conduit, hangers, supports, miscellaneous metal work, and accessories. Shield sprinkler heads with protective coverings while painting is in progress. Remove sprinkler heads which have been painted and replace with new sprinkler heads. For piping in unfinished spaces, provide primed surfaces with one coat of red alkyd gloss enamel to a minimum dry film thickness of 1.0 mil. Unfinished spaces include attic spaces, spaces above suspended ceilings, crawl spaces, pipe chases, mechanical equipment room, and space where walls or ceiling are not painted or not constructed of a prefinished material. For piping in finished areas, provide prime surfaces with two coats of paint to match adjacent surfaces, except provide valves and operating accessories with one coat of red alkyd gloss enamel. Upon completion of painting, remove protective covering from sprinkler heads.

a. Drying Time: Allow time between coats, as recommended by the

coating manufacturer, to permit thorough drying, but not to present topcoat adhesion problems. Provide each coat in specified condition to receive next coat.

b. Primers, and Intermediate Coats: Do not allow primers or intermediate coats to dry more than 30 days, or longer than recommended by manufacturer, before applying subsequent coats. Follow manufacturer's recommendations for surface preparation if primers or intermediate coats are allowed to dry longer than recommended by manufacturers of subsequent coatings. Each coat shall cover surface of preceding coat or surface completely, and there shall be a visually perceptible difference in shades of successive coats.

c. Finished Surfaces: Provide finished surfaces free from runs, drops, ridges, waves, laps, brush marks, and variations in colors.

d. Thermosetting Paints: Topcoats over thermosetting paints (epoxies and urethanes) should be applied within the overcoating window recommended by the manufacturer.

3.6.2 Mixing and Thinning of Paints

Reduce paints to proper consistency by adding fresh paint, except when thinning is mandatory to suit surface, temperature, weather conditions, application methods, or for the type of paint being used. Obtain written permission from the Contracting Officer to use thinners. The written permission shall include quantities and types of thinners to use.

When thinning is allowed, paints shall be thinned immediately prior to application with not more than 1 pint of suitable thinner per gallon. The use of thinner shall not relieve the Contractor from obtaining complete hiding, full film thickness, or required gloss. Thinning shall not cause the paint to exceed limits on volatile organic compounds. Paints of different manufacturers shall not be mixed.

3.6.3 Two-Component Systems

Two-component systems shall be mixed in accordance with manufacturer's instructions. Any thinning of the first coat to ensure proper penetration and sealing shall be as recommended by the manufacturer for each type of substrate.

3.6.4 Coating Systems

a. Systems by Substrates: Apply coatings that conform to the respective specifications listed in the following Tables:

Table

Division 5. Exterior Metal, Ferrous and Non-Ferrous Paint Table

Division 3. Interior Concrete Paint Table
Division 5. Interior Metal, Ferrous and Non-Ferrous Paint Table
Division 6. Interior Wood Paint Table
Division 9: Interior Plaster, Gypsum Board, Textured Surfaces Paint Table

b. Minimum Dry Film Thickness (DFT): Apply paints, primers,

varnishes, enamels, undercoats, and other coatings to a minimum dry film thickness of 1.5 mil each coat unless specified otherwise in the Tables. Coating thickness where specified, refers to the minimum dry film thickness.

c. Coatings for Surfaces Not Specified Otherwise: Coat surfaces which have not been specified, the same as surfaces having similar conditions of exposure.

d. Existing Surfaces Damaged During Performance of the Work, Including New Patches In Existing Surfaces: Coat surfaces with the following:

(1) One coat of primer.

(2) One coat of undercoat or intermediate coat.

(3) One topcoat to match adjacent surfaces.

3.7 COATING SYSTEMS FOR METAL

Apply coatings of Tables in Division 5 for Exterior and Interior.

a. Apply specified ferrous metal primer on the same day that surface is cleaned, to surfaces that meet all specified surface preparation requirements at time of application.

b. Inaccessible Surfaces: Prior to erection, use one coat of specified primer on metal surfaces that will be inaccessible after erection.

c. Shop-primed Surfaces: Touch up exposed substrates and damaged coatings to protect from rusting prior to applying field primer.

d. Surface Previously Coated with Epoxy or Urethane: Apply MPI 101, 1.5 mils DFT immediately prior to application of epoxy or urethane coatings.

e. Pipes and Tubing: The semitransparent film applied to some pipes and tubing at the mill is not to be considered a shop coat, but shall be overcoated with the specified ferrous-metal primer prior to application of finish coats.

f. Exposed Nails, Screws, Fasteners, and Miscellaneous Ferrous Surfaces. On surfaces to be coated with water thinned coatings, spot prime exposed nails and other ferrous metal with latex primer MPI 107.

3.8 COATING SYSTEMS FOR CONCRETE AND CEMENTITIOUS SUBSTRATES

Apply coatings of Tables in Division 3, 4 and 9 for Exterior and Interior.

3.9 COATING SYSTEMS FOR WOOD AND PLYWOOD

a. Apply coatings of Tables in Division 6 for Exterior and Interior.

b. Prior to erection, apply two coats of specified primer to treat and prime wood and plywood surfaces which will be inaccessible after erection.

c. Apply stains in accordance with manufacturer's printed instructions.

3.10 INSPECTION AND ACCEPTANCE

In addition to meeting previously specified requirements, demonstrate mobility of moving components, including swinging and sliding doors, cabinets, and windows with operable sash, for inspection by the Contracting Officer. Perform this demonstration after appropriate curing and drying times of coatings have elapsed and prior to invoicing for final payment.

3.11 PAINT TABLES

All DFT's are minimum values.

3.11.1 EXTERIOR PAINT TABLES

DIVISION 5: EXTERIOR METAL, FERROUS AND NON-FERROUS PAINT TABLE

STEEL / FERROUS SURFACES

A. New Steel that has been hand or power tool cleaned to SSPC SP 2 or SSPC SP 3

1. Alkyd
New; MPI EXT 5.1Q-G5 (Semigloss) Existing; MPI REX 5.1D-G5

Primer:	Intermediate:	Topcoat:
MPI 23	MPI 94	MPI 94

System DFT: 5.25 mils

B. New Steel that has been blast-cleaned to SSPC SP 6:

2. Alkyd
New; MPI EXT 5.1D-G5 (Semigloss) / Existing; MPI REX 5.1D-G5

Primer:	Intermediate:	Topcoat:
MPI 79	MPI 94	MPI 94

System DFT: 5.25 mils

C. New steel at exterior columns and trellis that has been blast-cleaned to SSPC SP 6:

1. Pigmented Polyurethane
MPI EXT 5.1J C6 (Gloss)

Primer:	Intermediate:	Topcoat:
MPI 101	MPI 72	MPI 78

EXTERIOR GALVANIZED SURFACES

D. New Galvanized surfaces:

1. Cementitious primer / Latex

MPI EXT 5.3A-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 26	MPI 11	MPI 11

System DFT: 4.5 mils

EXTERIOR GALVANIZED SURFACES
EXTERIOR SURFACES, OTHER METALS (NON-FERROUS)

E. Aluminum, aluminum alloy and other miscellaneous non-ferrous metal items not otherwise specified except hot metal surfaces, roof surfaces, and new prefinished equipment. Match surrounding finish:

1. Alkyd

MPI EXT 5.4F-G5 (Semigloss)
Primer: Intermediate: Topcoat:
MPI 95 MPI 94 MPI 94
System DFT: 5 mils

F. Surfaces adjacent to painted surfaces; Mechanical, Electrical, Fire extinguishing sprinkler systems including valves, conduit, hangers, supports, exposed copper piping, and miscellaneous metal items not otherwise specified except floors, hot metal surfaces, and new prefinished equipment. Match surrounding finish:

1. Alkyd

MPI EXT 5.1D-G5 (Semigloss)
Primer: Intermediate: Topcoat:
MPI 79 MPI 94 MPI 94
System DFT: 5.25 mils

G. Hot metal surfaces including smokestacks subject to temperatures up to 205 degrees C (400 degrees F):

1. Heat Resistant Enamel
MPI EXT 5.2A
Primer: Intermediate: Topcoat:
MPI 21 Surface preparation and number of coats per manufacturer's instructions.
System DFT: Per Manufacturer

H. Ferrous metal subject to high temperature, up to 400 degrees C (750 degrees F):

1. Inorganic Zinc Rich Coating
MPI EXT 5.2C
Primer: Intermediate: Topcoat:
MPI 19 Surface preparation and number of coats per manufacturer's instructions.
System DFT: Per Manufacturer

2. Heat Resistant Aluminum Enamel
MPI EXT 5.2B (Aluminum Finish)
Primer: Intermediate: Topcoat:
MPI 2 Surface preparation and number of coats per manufacturer's instructions.
System DFT: Per Manufacturer

3.11.2 INTERIOR PAINT TABLES

DIVISION 3: INTERIOR CONCRETE PAINT TABLE. New concrete floors which receive no floor finish:

DIVISION 3: INTERIOR CONCRETE PAINT TABLE

1. Sealer:

Primer:	Topcoat:
MPI 104	MPI 104

System DFT: 0.5 - 0.75 mils

DIVISION 5: INTERIOR METAL, FERROUS AND NON-FERROUS PAINT TABLE

INTERIOR STEEL / FERROUS SURFACES

A. Metal, Mechanical, Electrical, Fire extinguishing sprinkler systems including valves, conduit, hangers, supports, Surfaces adjacent to painted surfaces (Match surrounding finish), exposed copper piping, and miscellaneous metal items not otherwise specified except floors, hot metal surfaces, and new prefinished equipment:

1. High Performance Architectural Latex

MPI INT 5.1R-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 79	MPI 141	MPI 141

System DFT: 5 mils

B. Metal in toilets, food-preparation, restrooms, laundry areas, areas requiring a high degree of sanitation, and other high-humidity areas not otherwise specified except floors, hot metal surfaces, and new prefinished equipment:

1. Alkyd

MPI INT 5.1E-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 79	MPI 47	MPI 47

System DFT: 5.25 mils

C. Hot metal surfaces subject to temperatures up to 205 degrees C (400 degrees F):

1. Heat Resistant Enamel

MPI INT 5.2A

Primer:	Intermediate:	Topcoat:
MPI 21	Surface preparation and number of coats per manufacturer's instructions.	

System DFT: Per Manufacturer

DIVISION 6: INTERIOR WOOD PAINT TABLE

A. New Wood and Plywood, except floors; natural finish or stained:

1. Natural finish, oil-modified polyurethane

New; MPI INT 6.4J-G4 / Existing; MPI RIN 6.4L-G4

Primer:	Intermediate:	Topcoat:
MPI 57	MPI 57	MPI 57

System DFT: 4 mils

B. New Wood Doors; Natural Finish or Stained:

DIVISION 6: INTERIOR WOOD PAINT TABLE

1. Natural finish, oil-modified polyurethane
   New; MPI INT 6.3K-G4 / Existing; MPI RIN 6.3K-G4

Primer:	Intermediate:	Topcoat:
MPI 57	MPI 57	MPI 57

   System DFT: 4 mils

DIVISION 9: INTERIOR PLASTER, GYPSUM BOARD, TEXTURED SURFACES PAINT TABLE

A. New Wallboard not otherwise specified:

1. Latex

   New; MPI INT 9.2A-G5 (Semigloss) / Existing; RIN 9.2A-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 50	MPI 54	MPI 54

   System DFT: 4 mils

B. New Wallboard in toilets, food-preparation, restrooms, laundry areas, areas requiring a high degree of sanitation, corridors and classrooms not otherwise specified.:

2. Alkyd
   New; MPI INT 9.2C-G5 (Semigloss) / Existing; MPI RIN 9.2C-G5 (Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 50	MPI 47	MPI 47

   System DFT: 4 mils

-- End of Section --

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