REQUEST FOR PROPOSAL (RFP) FOR DESIGN/BUILD OF

SOLICITATION NO. DACA45-03-R-0026

FY 03 MAIN FIRE STATION

PROJECT NO. 12365

FORT CARSON, Colorado

APRIL 2003

Prepared By the
U.S. Army Corps of Engineers, Omaha District

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MAIN FIRE STATION
PN: 12365
FORT CARSON, COLORADO

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SOLICITATION, OFFER, AND AWARD (Construction, Alteration, or Repair)	1. SOLICITATION NO.	2. TYPE OF SOLICITATION	3. DATE ISSUED	PAGE OF PAGES
	DACA45-03-R-0026	☐ SEALED BID (IFB) ☒ NEGOTIATED (RFP)	14 APR 2003	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. 13	See SECTION 00100, Para. 13

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:

MAIN FIRE STATION
P.N. 12365
FORT CARSON, 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".

* Item 13A. For number of Copies see Section 00110.

11. The Contractor shall begin performance within 10 calendar days and complete it within 540 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 16 MAY 03 (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 PRICING SCHEDULE (Pages 00010-3,4,5)

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

STANDARD FORM 1442 BACK (REV. 4-85)

PRICING SCHEDULE

BASIC ITEMS				
Item No.	**Description**	**Quantity**	**Unit**	**Total Amount**
0001	**All Work Complete for the Main Fire Station with 3 Apparatus Bays (135A, 135B, and 135C); Excluding Options listed below.**			
	Construction Cost	**Job**	**Lump Sum**	**$_____**
	Design Cost	**Job**	**Lump Sum**	**$_____**
Total Basic for the Main Fire Station (Construction + Design)				**$_____**
OPTION ITEMS				
O-0001	**All work complete to add additional Apparatus Bay (135D) as shown on the drawings. Includes all associated work (roof, ceiling, piping, ducting, electrical, mechanical, pavements, doors etc.) to completely integrate Apparatus Bay 135D into the basic 3-bay configuration.**			
	Construction Cost	**Job**	**Lump Sum**	**$_____**
	Design Cost	**Job**	**Lump Sum**	**$_____**
O-0002	**All work complete to add additional Apparatus Bay (135E) as shown on the drawings. Includes all associated work (roof, ceiling, piping, ducting, electrical, mechanical, pavements, doors etc.) to completely integrate Apparatus Bay 135E into the basic 3-bay structure and Apparatus Bay 135D provided from Option O-0001.**			
	Construction Cost	**Job**	**Lump Sum**	**$_____**
	Design Cost	**Job**	**Lump Sum**	**$_____**

OPTION ITEMS (CONT)				
O-0003	**All work complete for the Clearstory addition as shown on the drawings. Includes all associated work (roof, ceiling, piping, ducting, electrical, mechanical, materials etc.) to completely integrate the Clearstory structure with the 5 Apparatus Bays.**			
	Construction Cost	**Job**	**Lump Sum**	**$_____**
	Design Cost	**Job**	**Lump Sum**	**$_____**
O-0004	**All Work Complete for Demolition of the existing Fire Station (Bldg. 1518) See drawings.**			
	Demolition Cost	**Job**	**Lump Sum**	**$_____**
O-0005	**Additional cost to provide Gazebo and patio slab in lieu of landscaping material provided under basic.**			
	Construction Cost	**Job**	**Lump Sum**	**$_____**
	Design Cost	**Job**	**Lump Sum**	**$_____**
O-0006	**All Work Complete to provide a Horseshoe Pit, as shown**			
	Construction Cost	**Job**	**Lump Sum**	**$_____**
	Design Cost	**Job**	**Lump Sum**	**$_____**
O-0007	**All work complete to provide Lighted Bollards. (See Drawings)**	**Job**	**Lump Sum**	**$_____**

GRAND TOTAL AMOUNT FOR THE MAIN FIRE STATION	
GRAND TOTAL AMOUNT (BASIC + ALL OPTIONS)	**$_____**

NOTES:

1. See Section 00100, INSTRUCTIONS, CONDITIONS AND NOTICES OFFERORS, paragraph 3 EVALUATION OF OPTIONS for evaluation of bid items and options. The Government reserves the right to exercise the Options within 90 days after Notice to Proceed. The evaluation of options will not obligate the Government to exercise the option(s). Option O-0002 will not be considered for award unless Option O-0001 is awarded. Option O-0003 will not be considered for award unless Options O-0001 and O-0002 are awarded. The awarding of any one Option does not obligate the Government to award any subsequent Options.

2. Prices must be entered for all line items on the Pricing Schedule. Grand total amount price 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 grand total amount, the lump-sum prices will be considered the price.

3. A modification to the Pricing Schedule, which provides for a single adjustment to the grand total amount will not be accepted. Modification to Pricing Schedule items, basic or options, should state the application of the adjustment to each respective lump-sum price affected. If the modification is not so apportioned the Pricing Schedule item will not be evaluated.

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SECTION 00100

INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS
(July 2000, Revised September 2002)

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SECTION 00100

INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS

1 DEFINITION OF "DESIGN-BUILD" PROCESS

The "Design-Build Process is the procurement of a facility utilizing a Request for Proposal (RFP) to solicit for the design and construction of a facility by a single contractual entity. The contractual entity may be a "Design-Build" firm, or joint venture between an architect-engineer (A-E) and construction firm, or a construction management (CM) firm joint venture with an A-E and a construction firm.

2 SOLICITATION RESTRICTIONS.

2.1 GENERAL CONTRACTOR.

This solicitation is restricted to Section 8(a) firms, Small Business Administration Region VIII (North Dakota, South Dakota, Wyoming, Montana, Utah and Colorado).

2.2 ESTIMATED DESIGN AND CONSTRUCTION COST.

The estimated design and construction cost of this project is between $2,500,000 and $5,000,000.

2.3 DESIGN/CONSTRUCTION COST LIMITATION (DCCL)

The design and construction costs will be subject to the funds available for this project. The DCCL for this project is $3,900,000. The Government may not be able make an award if the DCCL for this project is exceeded.

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 1999)

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.daps.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) 697-2667/2179
Facsimile (215) 697-1462.

(End of provision)

5 (FAR 52.215-1) INSTRUCTIONS TO OFFERORS--COMPETITIVE ACQUISITION (MAY 2001)

(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) The Government may disclose the following information in postaward debriefings to other offerors:

(i) The overall evaluated cost or price and technical rating of the successful offeror;

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

(iii) A summary of the rationale for award; and

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

(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 Request For Proposal drawings prior to the date set for receiving offers. Such revisions will be announced by an amendment or amendments to this Request For Proposal. [**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 (FAR 52.204-6) DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER (JUNE 1999)

(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 (DFARS 252.204-7004) REQUIRED CENTRAL CONTRACTOR REGISTRATION (NOV 2001)

(a) Definitions.

As used in this clause--

(1) “Central Contractor Registration (CCR database” means the primary DoD repository for contractor information required for the conduct of business with DoD.

(2) “Data Universal Numbering System (DUNS) number” means the 9-digit number assigned by Dun and Bradstreet Information Services to identify unique business entities.

(3) “Data Universal Numbering System +4 (DUNS+4) number” means the DUNS number assigned by Dun and Bradstreet plus a 4-digit suffix that may be assigned by a parent (controlling) business concern. This 4-digit suffix may be assigned at the discretion of the parent business concern for such purposes as identifying subunits or affiliates of the parent business concern.

(4) “Registered in the CCR database” means that all mandatory information, including the DUNS number or the DUNS+4 number, if applicable, and the corresponding Commercial and Government Entity (CAGE) code, is in the CCR database; the DUNS number and the CAGE code have been validated; and all edits have been successfully completed.

(b)(1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee must be registered in the CCR database prior to award, during performance, and through final payment of any contract resulting from this solicitation, except for awards to foreign vendors for work to be performed outside the United States.

(2) The offeror shall provide its DUNS or, if applicable, its DUNS+4 number with its offer, which will be used by the Contracting Officer to verify that the offeror is registered in the CCR database.

(3) Lack of registration in the CCR database will make an offeror ineligible for award.

(4) DoD has established a goal of registering an applicant in the CCR database within 48 hours after receipt of a complete and accurate application via the Internet. However, registration of an applicant submitting an application through a method other than the Internet may take up to 30 days. Therefore, offerors that are not registered should consider applying for registration immediately upon receipt of this solicitation.

(c) The Contractor is responsible for the accuracy and completeness of the data within the CCR, 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 confirm on an annual basis that its information in the CCR database is accurate and complete.

(d) Offerors and contractors may obtain information on registration and annual confirmation requirements by calling 1-888-227-2423, or via the Internet at http://www.ccr.gov.

(End of clause)

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 and pre-proposal conference will be held at Fort Carson on 30 April 2003. Assembly will be at the Post Field House located across from the project site. All vehicles are to park on the Wetzel Avenue side of the building. The pre-proposal conference will begin at 9:00 a.m. The project site visit is scheduled from 11:00 a.m. until noon. After the site visit, questions will be addressed on the RFP and project/site. To register attendance and receive Fort Carson access requirements for the pre-proposal

conference/site inspection, contact Ms. Margaret Wimberly at the Fort Carson Resident Office Telephone: (719) 526-5448 or FAX: (719) 526-5365

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 [proposal documents][plans and specifications] (limit One per firm)/ amendments**/ Receipt of Proposals	Loreen Blume 402-221-____ (phone) 402-221-4199 (fax)	loreen.k.blume@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	Vincent Turner 402-221-4561 (phone) 402-221-4828(fax)	vincent.c.turner@usace.army.mil
CD-ROM	Specifications Section Mike Pisci 402-221-4413 402-221-3842	michael.r.pisci@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 design and construct a new Main Fire Station located at Fort Carson, Colorado in accordance with the Request for Proposal documents issued with this solicitation.

17 PROPOSAL SUBMISSION AND EVALUATION REQUIREMENTS AND INSTRUCTIONS.

See Section 00110: PROPOSAL SUBMISSION, EVALUATION, AND CONTRACT AWARD.

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 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).

19.1 CITY TAXES.

The Municipality of Colorado Springs also has a sales and use tax. The

Municipal tax authorities should be contacted by the proposer to determine applicability of the tax to this project.

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

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SECTION 00110
PROPOSAL SUBMISSION, EVALUATION, AND CONTRACT AWARD

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SECTION 00110
PROPOSAL SUBMISSION, EVALUATION, AND CONTRACT AWARD

1. PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS

If you do not want the data submitted by your firm disclosed by the Government, follow the procedure specified in Section 00100, INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS, Paragraph 4(e) Restriction on Disclosure and Use of Data.

All proposals submitted will become, upon receipt, the property of the U.S. Government and will not be returned. If the Offeror desires to withdraw its proposal, it do so in accordance with Section 00100, INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS, Paragraph 4(c)(3) Submission, modification, revision, and withdrawal of proposals.

1.1 WHO MAY SUBMIT

This solicitation is restricted to Section 8(a) firms, Small Business Administration Region VIII (North Dakota, South Dakota, Wyoming, Montana, Utah and Colorado).

1.2 SIZE OF PRINTED MATTER SUBMISSIONS

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

1.3 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.

Proposal shall be submitted in a separate envelope/package with the type of proposal (i.e., Technical or Price) clearly printed on the outside of the envelope or package.

1.4 SUBMISSION DEADLINE

Proposals shall be received by the USACE Contracting Activity no later than the time and date specified in Block 13 of Standard Form 1442.

Due to heightened security at Government installations, those offerors who have their proposals hand-delivered shall contact Loreen K. Blume, Contract Specialist at (402) 221-4265 prior to delivering to the U.S. Army Corps of Engineer District, Omaha, 106 South 15th Street, Omaha, NE 68102-1618.

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

1.5 PROPOSAL FORMAT

All proposals shall contain the evaluation requirements stated herein and every binder shall contain: Cover Letter, Table of Contents, List of Tables (if required), List of Figures (if required), List of Appendices, and Name/Address/Telephone Number of the Offeror. Contents of the binders shall be tabbed and labeled to afford easy identification. The contents shall follow the order of the evaluation criteria and all pages shall be numbered consecutively. Proposal clarity, organization (as requested in this solicitation) and cross-referencing are mandatory.

The Technical proposal (Tabs 1 through 5 listed below) shall be presented in a manner, which allows it to "STAND ALONE." No material (information not part of proposal) shall be incorporated by reference. Proposal organization must be easy to follow. Offeror submitting proposals shall limit submission to data essential for evaluation of proposals so that a minimum of time and monies are expended in preparing information required by the Request for Proposal (RFP). Elaborate artwork, expensive paper and bindings, and expensive visual and other presentation aids are neither necessary nor wanted. The offeror's name, address, signature, and telephone number shall be included on the cover letter of the submittal to be evaluated. Offeror shall submit the **original and three (3)** copies of their proposal, each consisting of a 3-ring binder with Tabs (dividers) separating the sections as specified below.

1.6 MULTIPLE SUBCONTRACTORS:

If more than one firm is under consideration for a key subcontracted feature, identify each firm. If more than one firm will perform work on a subcontracted feature, explain the roles of each firm and specific items of work they will perform. If multiple subcontractors are provided and any are determined unacceptable, then the proposal will be determined unacceptable.

1.7 JOINT VENTURES:

If the Offeror represents the combining of two or more firms for the purpose of proposing on this RFP, then each company must list examples similar to those required in paragraph 2.1 a), below.

TABLE 1	
TAB	**SUBMITTAL REQUIREMENTS**
	Cover Letter
TAB 1	**Para. 2.1 - Design Experience**
	a) Offeror's Design Personnel Experience
	b) Minimum Dollar Amount of Key Designer Facilities
TAB 2	**Para. 2.2 - Construction Experience**
	a) Offeror's Previously Constructed Facilities
	b) Minimum Dollar Amount of Previously Constructed Facilities
TAB 3	**Para. 2.3 - Offeror's Key Construction Personnel Qualifications and Experience**
	a) Construction Project Manager
	b) On-Site Project Superintendent
	c) On-Site Contractor Quality Control (CQC) System Manager
TAB 4	**Para. 2.4 - Subcontractor Experience**
	a) Offeror's Subcontractor Experience
	i. - Electrical
TAB 5	**Para. 2.5 - Past Performance, Construction Firm/Design Firm**
	a) Offeror's Past Construction Performance b) Offeror's Past Design Performance
TAB 6	**Para. 2.6 - Pricing**
	a) Section 00010, Solicitation/Contract Form and Pricing Schedule
	b) Section 00600, Representations, Certifications and Other Statements of Offerors
	c) Pre-Award Survey Information (Local Provision) (Sep 93)
	d) Financial
	i - Name, address, and fax number of Financial Institution
	ii. - Name and phone number of finance individual (primary and alternate) to be contacted for information.
	e) Bonding Information

2. SUBMITTALS

The requirements specified in the solicitation are considered minimum requirements. A proposal that fails to comply with the minimum technical requirements will not be eligible for award notwithstanding it may offer the lowest price.

2.1 TAB 1 - DESIGN EXPERIENCE

a) **Offeror's Design Personnel Experience:** Submit one or two page resumes of lead and support design personnel, for categories listed below who will work on this project. Resumes for each designer shall have the following: Design Project Manager and lead/key designers shall be registered professional architects or engineers (preferably registered in the state of Colorado) with a minimum of 5 years experience as a registered professional in design. Indicate design project experience with past firms up to current status over the past six (6) years. Include an Organizational Chart identifying each design team member proposed to work on the Main Fire Station at Fort Carson. If, because of reasons beyond the control of the design team, the named individuals are not able to fulfill this obligation, replacement personnel having similar education and experience shall be presented for acceptance by the Contracting Officer.

- Project Manager (Registered Architect or Engineer)
- Registered Architect*** (key designer)**
- Registered Structural Engineer with training related to the 1997 National Earthquake Hazard Reduction Program (NEHRP)*** (key designer)**
- Registered Mechanical Engineer*** (key designer)**
- Registered Electrical Engineer*** (key designer)**
- Registered Fire Protection Engineer*** (key designer)**
- Registered Civil Engineer
- Registered Landscape Architect
- Interior Designer - Certified by the National Council of Interior Designers Qualifications (NCIDQ)
- Certified Corrosion Engineer

* In addition to the above resume item requirements, the above key designer personnel shall have completed a minimum of two (2) project designs for life safety type facilities (Fire Stations, Police HQ, Hospital Emergency facilities) in their respective disciplines. Project example information shall include:

- Dates for their submitted design experience on facilities submitted
- Summary and brief description of the facilities submitted
- Date when the project was started and actual finish date
- Name, address, telephone and fax number of Prime Construction Contractor, Owner and Owner's Representative who are familiar with the designer firm's experience on the project and can verify the experience cited.

b) **Minimum Dollar Amount of Key Designer Facilities:** Design projects cited for key designers in a) above, shall have a construction dollar values of at least $1,500,000 and completed within the past six (6) years**. <u>Indefinite-Delivery, Indefinite Quantity (IDIQ) Contracts, where numerous Task Orders are summed to meet the minimum construction dollar value identified herein, are not acceptable</u>**.

2.2 TAB 2 - CONSTRUCTION EXPERIENCE

a) **Offeror's Previously Constructed Facilities:** For this tab the offeror shall submit (3) project summaries, which demonstrate his/her experience as a prime contractor on construction projects of similar scope and complexity. Similar scope and complexity is defined as Life Safety type facilities. This could include Fire Stations, Police HQ, Hospital Emergency facilities, etc. Each project summary should consist of a one

or two page narrative of the project and indicate all project specifics as noted herein. No more than 3 (three) projects may be submitted. Only those projects for which the offeror was the prime construction contractor should be submitted. Project examples may include past experience as a prime design-build agent, or joint venture team, or prime construction contractor. Project example information shall include: Summaries for each project example submitted; picture/photo of the each project example; a description of the project; construction contract award amount; final construction cost; location; date when the project was started; original contract finish date and actual finish date. All summaries shall contain the name, address, telephone and fax number of a representative of the owner (as well as one alternate individual not affiliated with your firm) familiar with your firm's experience on the project that can verify the experience cited.

b) **Minimum Dollar Amount of Previously Constructed Facilities:** Construction projects cited in a) above should have a construction dollar value of at least $2,000,000 and completed within the past six (6) 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**.

2.3 TAB 3 - OFFEROR'S KEY CONSTRUCTION PERSONNEL QUALIFICATIONS AND EXPERIENCE

Offerors must provide documentation that demonstrates compliance with required qualifications of the proposed Construction Project Manager, Project Superintendent, and Contractor Quality Control (CQC) System Manager. This documentation may include resumes or other statements demonstrating the experience of these individuals.

a) **Construction Project Manager:** The Project Manager shall be a registered engineer or registered architect or graduate construction manager and shall have at least 5 years experience as a Project Manager on construction projects.

b) **On-Site Project Superintendent:** The Project Superintendent shall be a graduate engineer with 3 years experience as a Project Superintendent on construction projects or an experienced construction person with 5 years experience as a Project Superintendent on construction projects.

c) **On-Site Contractor Quality Control (CQC) System Manager:** The Contractor Quality Control System (CQC) Manager shall be a graduate engineer with 3 years experience or an experienced construction person with a minimum of 5 years experience performing as a CQC System Manager on projects.

2.4 TAB 4 - SUBCONTRACTOR EXPERIENCE

a) **Offeror's Subcontractor Construction Experience:** Provide examples of construction for subcontractor discipline listed below. The following company experience is required:

i. **Electrical:** The electrical systems construction contractor (firm) shall have licensed electricians with a minimum of 5 years of journeyman level experience working. Firm shall have constructed and placed electrical systems for a minimum of 3 facilities within the last 6 years. In addition, the electrical systems contractor's examples shall have demonstrated experience with installing sensitive electronic communications equipment and reporting systems as well as experience in installing fiber optic and copper communications systems and the interfacing of controls and alarm systems.

For the subcontractor above, submit the following data on the facility examples:

- Project titles and locations
- Dollar value of construction
- Construction period (month/year start to month/year end)
- Give Primary POC for the project submitted, include owner and prime contractor (name/agency/firm city, state, phone number). If subcontractor was prime constructor, stipulate.

2.5 TAB 5 - PAST PERFORMANCE, CONSTRUCTION FIRM/DESIGN FIRM

a) **Offeror's Past Construction Performance:** The Offeror shall submit past construction performance evaluations on projects within the last 6 years, including projects submitted under Paragraph 2.2 a), above. The Government reserves the right to contact the evaluator to verify your firm's construction performance and performance rating. In addition, all DOD or non-DOD government projects with Construction Contractor Appraisal Support System (CCASS) information will be accessed for evaluation information. For performance evaluation not recorded in CCASS, the attached Performance Summary Sheet (Construction) shall be filled out by an independent party (owner or owner's representative) and submitted. The minimum requirement, which must be demonstrated in order for past performance to be declared acceptable requires an overall project performance rating of "satisfactory" and above for work performed on each construction project. The absence of company past performance information will result in neither an acceptable or unacceptable rating for that factor. Rather, the overall proposal will be evaluated based on the other factors without any weight being given to past performance. The Government reserves the right to evaluate ratings in CCASS, as well as to obtain past performance data from any source, if data is available.

   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.

b) **Offeror's Past Design Performance:** The Offeror shall submit past design performance evaluations on projects within the last 6 year, including projects submitted under Paragraph 2.1 a), above. The Government reserves the right to contact the evaluator to verify your firm's design performance and performance rating. In addition, all DOD or non-DOD government projects with Architect Contractor Appraisal Support System (ACASS) information will be accessed for evaluation information. For performance evaluation not recorded in ACASS, an attached Performance Summary Sheet (Design) shall be filled out by an independent party (owner or owner's representative) and submitted. The minimum requirement, which must be demonstrated in order for past performance to be declared acceptable requires an overall project performance rating of "satisfactory" and above for work performed on each construction project. The absence of company past performance information will result in neither an acceptable or unacceptable rating for that factor. Rather, the overall proposal will be evaluated based on the other factors without any weight being given to past performance. The Government reserves the right to evaluate ratings in CCASS, as well as to obtain past performance data from any source, if data is available.

2.6 TAB 6 - PRICING

The format of Tab 6 shall include what is detailed below.

a) **Section 00010, Solicitation/Contract Form and Pricing Schedule:** The total combined cost for the construction will be considered for award.

b) **Section 00600, Representations, Certifications and Other Statements of Offerors:** This item will not be considered for evaluation purposes, but is required to be completed and submitted with your offer.

c) **Pre-Award Survey Information (Local Provision) (Sep 93)**: In accordance with FAR Clause 52.228-15 PERFORMANCE AND PAYMENT BONDS, request that the following information be submitted with your offer. This facilitates the award process.

d) **Financial:**

   i. Name, address, and fax number of Financial Institution

   ii. Name and phone number of finance individual (primary and alternate) to be contacted for information.

e) **Bonding Information:** Provide the name, address, regular phone number and fax number of your Surety Company.

3. EVALUATION

Technical acceptability and lowest price will be the determining factors for award. Because of the number of solicitations requested, uniformity of all proposals is essential to assure fair and accurate evaluation. All proposals must comply with the instructions in the solicitation. Those proposals, which are properly submitted, will be evaluated to determine technically acceptable contractor(s). A proposal that fails to comply with any minimum technical requirements will not be eligible for award regardless that it may offer the lowest price.

3.1 TECHNICAL EVALUATION

Proposals will be evaluated by a Source Selection Evaluation Board (SSEB). Pricing data will not be part of the technical evaluation. Criteria for the technical evaluation, as set forth in the solicitation will be the sole basis for determining the technical merit of proposals. Each Factor Level and Sub-Factor Level within a TAB will be assigned a technical evaluation of "Acceptable" or "Unacceptable". Any "Unacceptable" rating for TABs 1-5 at the Factor Level or Sub Factor Level will render the complete technical portion of the offer as "Unacceptable". No further evaluation will be made on the Offeror's proposal, including price.

3.2 EVALUATION OF PRICING

a) Pricing: Pricing of all acceptable rated proposals will be evaluated by the Government considering:

i. Reasonableness: Prices are reasonable when compared with the Government Estimate and other price proposals.

ii. Realism: Prices are compatible with the proposal scope and effort, and are realistic. For example: Prices are neither excessive nor insufficient for the effort to be accomplished.

iii. Completeness: All pricing information has been submitted and relates directly to the proposal requirements.

4. CONTRACT AWARD

Subject to provisions contained herein, award will be made to one Offeror. The Government will select the Offeror providing a technically acceptable proposal with the lowest price. To be considered for award, proposals shall conform to the terms and conditions contained in the solicitation. No proposal shall be accepted that does not comply with all technical requirements specified in this solicitation or which includes stipulations or qualifying conditions.

4.1 SELECTION AND AWARD WITHOUT EXCHANGES

It is the intent of the Government to make award based upon initial offers, without further exchanges or additional information. Therefore, proposals should be submitted initially on the most favorable terms of price and technical requirements. Do not assume an opportunity will be afforded to clarify, discuss, or revise proposals. If award is not made on initial offers, exchanges will be conducted as needed.

4.2 SELECTION AND AWARD WITH EXCHANGES

If exchanges are conducted, the Source Selection Evaluation Board (SSEB) will evaluate supplemental information provided by the Offeror and may adjust a proposal's acceptability as required. The SSEB will provide a list of the technically acceptable offers to the Source Selection Authority.

4.3 PROPOSAL EXPENSES AND PRECONTRACT COSTS

This solicitation does not commit the Government to pay costs incurred in preparation and submission of proposals or for any other costs incurred prior to execution of a formal contract.

4.4 DEBRIEFINGS

Debriefings will be conducted in accordance with FAR 15.506

MAIN FIRE STATION
DACA45-03-R-0026
FORT CARSON, COLORADO
PERFORMANCE SUMMARY SHEET (CONSTRUCTION)

SOLICITATION NUMBER DACA45-03-R-0026

Contractor's Name: _____

Project Name: _____

Project Location: _____

Name & Title of Person Completing this Summary: _____

Name of Firm of Person Completing this Summary: _____

Signature of Person Completing this Summary: _____

Date: _____ Phone Number: _____

1. Overall Rating of this Contractor:

____ Outstanding

____ Above Average

____ Satisfactory

____ Marginal

____ Unsatisfactory

2. Cost Growth:

Original Construction Contract Award Amount: _____

Final Construction Contract Amount: _____

In your opinion, which of the following statement best describes your experience with cost growth on this project:

_____
_____
_____

____ a. The contractor did not contribute to any cost growth.

____ b. The contractor contributed to some degree to the cost growth experienced on this project.

____ c. The contractor contributed significantly to the cost growth experienced on this project.

Any additional cost growth comments:

3. Time Growth:

Original Contract Completion Date: _____

Final Contract Completion Date: _____

In your opinion, which of the following statement best describes your experience with time growth on this project:

_____
_____
_____

____ a. The contractor did not contribute to any time growth.

____ b. The contractor contributed to some degree to the time growth experienced on this project.

____ c. The contractor contributed significantly to the time growth experienced on this project.

Any additional time growth comments:

_____
_____
_____

4. Quality: Which of the following statements most accurately describe the quality of the work the contractor provided on your project:

____ a. The work provided by the contractor was of high quality.

____ b. The work provided by the contractor was of fair quality.

____ c. The work provided by the contractor was of poor quality.

Any additional comments on quality:

_____
_____
_____

5. The willingness of past customers to have a contractor perform more work for them is an indication of overall satisfaction with the contractor's performance. If you were to construct another project similar to the one recently completed, and you had the responsibility and total authority to select the contractor for the new project, which of the following statements most accurately depicts the approach you would take?

____ a. I would have this contractor construct the new project.

____ b. I would consider this contractor, but I would also explore the possibility of using other contractors to construct the project.

____ c. I would not consider using this contractor to construct the new project.

6. Any additional comments (additional sheets may be added, if necessary):

MAIN FIRE STATION
DACA45-03-R-0026
FORT CARSON, COLORADO
PERFORMANCE SUMMARY SHEET (DESIGN)

SOLICITATION NUMBER DACA45-03-R-0026

Designer's Name: _____

Project Name: _____

Project Location: _____

Name & Title of Person Completing this Summary: _____

Name of Firm of Person Completing this Summary: _____

Signature of Person Completing this Summary: _____

Date: _____ Phone Number: _____

1. Overall Rating of this Designer:

____ Outstanding

____ Satisfactory

____ Unsatisfactory

2. Cost Growth:

In your opinion, which of the following statement best describes your experience with cost growth on this project:

____ a. The designer did not contribute to any cost growth.

____ b. The designer contributed somewhat to the cost growth experienced on this project.

____ c. The designer contributed significantly to the cost growth experienced on this project.

Any additional cost growth comments:

_____
_____
_____

3. Time Growth:

In your opinion, which of the following statement best describes your experience with time growth on this project:

____ a. The designer did not contribute to any time growth.

____ b. The designer contributed somewhat to the time growth experienced on this project.

____ c. The designer contributed significantly to the time growth experienced on this project.

Any additional time growth comments:

_____

_____

_____

4. Quality: Which of the following statements most accurately describe the quality of the work the designer provided on your project:

____ a. The work provided by the designer was of high quality.

____ b. The work provided by the designer was of fair quality.

____ c. The work provided by the designer was of poor quality.

Any additional comments on quality:

_____

_____

_____

5. The willingness of past customers to have a designer perform more work for them is an indication of overall satisfaction with the designer's performance. If you were to design/construct another project similar to the one recently completed, and you had the responsibility and total authority to select the designer for the new project, which of the following statements most accurately depicts the approach you would take?

____ a. I would have this designer involved in the new project.

____ b. I would consider this designer, but I would also explore the possibility of using other designers on this project.

____ c. I would not consider using this designer on the new project.

6. Any additional comments (additional sheets may be added, if necessary):

_____

_____

_____

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. (FAR 52.204-3) TAXPAYER IDENTIFICATION (OCT 1998).

(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 (APR 2002) 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 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).

(a) It [ ] has, [ ] has not participated in a previous contract or subcontract subject 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 (OCT 2000) [For Contracts over $100,000]

(a) Submission of this certification is a prerequisite for making or entering into this contract imposed by Executive Order 12969, August 8, 1995.

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

(1) As the owner or operator of a 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 the 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 the Form R filing and reporting requirements because each facility is exempt for at least one of the following reasons: (Check each block that is applicable.)

[ ] (i) The facility does not manufacture, process or otherwise use any toxic chemicals listed under section 313(c) of EPCRA, 42 U.S.C. 11023(c);

[ ] (ii) 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);

[ ] (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 Standard Industrial Classification Code (SIC) major groups 20 through 39 or their corresponding North American Industry Classification System (NAICS) sectors 31 through 33; or

[ ] (v) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rica, Guam, American Somoa, the United States Virgin Islands, the Norther Mariana Islands, or any other territory or possession over which the United States has jurisdication.

17. (DFARS 252.225-7031) SECONDARY ARAB BOYCOTT OF ISRAEL (JUN 1992)

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

(1) "Foreign person" means any person other than a United States person as defined in Section 16(2) of the Export Administration Act of 1979 (50 U.S.C. App. Sec 2415).

(2) "United States person" is defined in Section 16(2) of the Export Administration Act of 1979 and means any United States resident or national (other than an individual resident outside the United States and employed by other than a United States person), any domestic concern (including any permanent domestic establishment of any foreign concern), and any foreign subsidiary or affiliate (including any foreign establishment) of any domestic concern which is controlled in fact by such domestic concern, as determined under regulations of the President.

(b) Certification.

By submitting this offer, the Offeror, if a foreign person, company, company or entity, certifies 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. Sec 2407(a) prohibits a United States person from taking.

(End of clause)

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.

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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 (DEC 2001) ALTERNATE I (MAY 2001)

a) “Agency head” or “head of the agency” means the Secretary (Attorney General, Administrator, Governor, Chairperson, or other chief official, as appropriate) of the agency, unless otherwise indicated, including any deputy or assistant chief official of the executive agency.

(b) “Commercial component” means any component that is a commercial item.

(c) “Commercial item” means—

(1) Any item, other than real property, that is of a type customarily used by the general public or by non-governmental entities for purposes other than governmental purposes, and that—

(i) Has been sold, leased, or licensed to the general public; or

(ii) Has been offered for sale, lease, or license to the general public;

(2) Any item that evolved from an item described in paragraph (c)(1) of this clause through advances in technology or performance and that is not yet available in the commercial marketplace, but will be available in the commercial marketplace in time to satisfy the delivery requirements under a Government solicitation;

(3) Any item that would satisfy a criterion expressed in paragraphs (c)(1) or (c)(2) of this clause, but for—

(i) Modifications of a type customarily available in the commercial marketplace; or

(ii) Minor modifications of a type not customarily available in the commercial

marketplace made to meet Federal Government requirements. “Minor” modifications means modifications that do not significantly alter the nongovernmental function or essential physical characteristics of an item or component, or change the purpose of a process. Factors to be considered in determining whether a modification is minor include the value and size of the modification and the comparative value and size of the final product. Dollar values and percentages may be used as guideposts, but are not conclusive evidence that a modification is minor;

(4) Any combination of items meeting the requirements of paragraphs (c)(1), (2), (3), or (5) of this clause that are of a type customarily combined and sold in combination to the general public;

(5) Installation services, maintenance services, repair services, training services, and other services if—

(i) Such services are procured for support of an item referred to in paragraph (c)(1), (2), (3), or (4) of this definition, regardless of whether such services are provided by the same source or at the same time as the item; and

(ii) The source of such services provides similar services contemporaneously to the general public under terms and conditions similar to those offered to the Federal Government

(6) Services of a type offered and sold competitively in substantial quantities in the commercial marketplace based on established catalog or market prices for specific tasks performed under standard commercial terms and conditions. This does not include services that are sold based on hourly rates without an established catalog or market price for a specific service performed. For purposes of these services—

(i) “Catalog price” means a price included in a catalog, price list, schedule, or other form that is regularly maintained by the manufacturer or vendor, is either published or otherwise available for inspection by customers, and states prices at which sales are currently, or were last, made to a significant number of buyers constituting the general public; and

(ii) “Market prices” means current prices that are established in the course of ordinary trade between buyers and sellers free to bargain and that can be substantiated through competition or from sources independent of the offerors.

(7) Any item, combination of items, or service referred to in paragraphs (c)(1) through (c)(6), notwithstanding the fact that the item, combination of items, or service is transferred between or among separate divisions, subsidiaries, or affiliates of a Contractor; or

(8) A nondevelopmental item, if the procuring agency determines the item was developed exclusively at private expense and sold in substantial quantities, on a competitive basis, to multiple State and local Governments.

(d) “Component” means any item supplied to the Government as part of an end item or of another component, except that for use in 52.225-9, and 52.225-11 see the definitions in 52.225-9(a) and 52.225-11(a).

(e) “Contracting Officer” means a person with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings. The term includes certain authorized representatives of the Contracting Officer acting within the limits of their authority as delegated by the Contracting Officer.

(f) “Nondevelopmental item” means—

(1) Any previously developed item of supply used exclusively for governmental purposes by a Federal agency, a State or local government, or a foreign government with which the United States has a mutual defense cooperation agreement;

(2) Any item described in paragraph (f)(1) of this definition that requires only minor modification or modifications of a type customarily available in the commercial marketplace in order to meet the requirements of the procuring department or agency; or

(3) Any item of supply being produced that does not meet the requirements of paragraph (f)(1) or (f)(2) solely because the item is not yet in use.

(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 (JUN 1997)

(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, the Commonwealth of Puerto Rico, a territory or possession 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. 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.

15. *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.

16. 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)

17. *FAR 52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (SEP 1990) [<u>For Military Contract's Only</u>]

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).

18. DELETED~~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.~~

19. *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)

20. *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)

21. *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)

22. *FAR 52.215-15 PENSION ADJUSTMENTS AND ASSET REVERSIONS (DEC 1998)

(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 adjustment amount shall be the amount measured, assigned, and allocated in accordance with 48 CFR 9904.413-50(c)(12) for contracts and subcontracts that are subject to Cost Accounting Standards (CAS) Board rules and regulations (48 CFR Chapter 99). For contracts and subcontracts that are not subject to CAS, the adjustment amount shall be 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 9904.413-50(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)

23. *FAR 52.215-16 FACILITIES CAPITAL COST OF MONEY (OCT 1997)

(a) Facilities capital cost of money will be an allowable cost under the contemplated contract, if the criteria for allowability in subparagraph 31.205-10(a)(2) of the Federal Acquisition Regulation 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)

24. *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)

25. *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)

26. *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)

27. *FAR 52.219-8 UTILIZATION OF SMALL BUSINESS CONCERNS (OCT 2000)

(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 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)

28. *FAR 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (JAN 2002) [When Contracting By Negotiations]

(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)

29. *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.

30. 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.

31. 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.

32. 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)

33. 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.

34. *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)

35. *FAR 52.222-3 CONVICT LABOR (AUG 1996)

The Contractor agrees not to employ in the performance of this contract any person undergoing a sentence of imprisonment which has been imposed by any court of a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or the Trust Territory of the Pacific Islands. This limitation, however, shall not prohibit the employment by the Contractor in the performance of this contract of persons on parole or probation to work at paid employment during the term of their sentence or persons who have been pardoned or who have served their terms. Nor shall it prohibit the employment by the Contractor in the performance of this contract of persons confined for violation of the laws of any of the States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or the Trust Territory of the Pacific Islands who are authorized to work at paid employment in the community under the laws of such jurisdiction, if--

(a) (1) The worker is paid or is in an approved work training program on a voluntary basis;

(2) Representatives of local union central bodies or similar labor union organizations have been consulted;

(3) 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; and

(4) 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

(b) 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.

36. *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)

37. *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.

38. *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.

39. *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.

40. *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.

41. *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.

42. *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.

43. *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.

44. *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.

45. *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.

46. *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.

47. *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)

48. *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).

49. *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)

50. *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.

51. *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)

52. *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)

53. *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 Identification No.

(If none, insert "None")

_____ _____
_____ _____
_____ _____

(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)

54. *FAR 52.223-5 POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (APR 1998) [For Work on Federal Facilities]

(a) Executive Order 12856 of August 3, 1993, 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).

(b) The Contractor shall provide all information needed by the Federal facility to comply with the emergency planning reporting requirements of Section 302 of EPCRA; the emergency notice requirements of Section 304 of EPCRA; the list of Material Safety Data Sheets required by Section 311 of EPCRA; the emergency and hazardous chemical inventory forms of Section 312 of EPCRA; the toxic chemical release inventory of Section 313 of EPCRA, which includes the reduction and recycling information required by Section 6607 of PPA; and the toxic chemical reduction goals requirements of Section 3-302 of Executive Order 12856.

55. *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.

56. 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)

57. *FAR 52.223-14 TOXIC CHEMICAL RELEASE REPORTING (OCT 2000)
[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 use 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 under section 313(c) of EPCRA, 42 U.S.C. 11023(c);

(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 Standard Industrial Classification Code (SIC) major groups 20 through 39 or their corresponding North American Industry Classification System (NAICS) sectors 31 through 33; or

(5) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rica, Guam, American Somoa, the United States Virgin Islands, the Norther Mariana Islands, or any other territory or possession over which the United States has jurisdication.

(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 one 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 ownor or operator of a facility used in the performance of this contract 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).

58. 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.

59. *FAR 52.225-9 BUY AMERICAN ACT—CONSTRUCTION MATERIALS (MAY 2002) (<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, U.S. territories and possessions, Puerto Rico, the Northern Mariana Islands, and any other place subject to U.S. jurisdiction, but does not include leased bases.

(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).]*

60. *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)

61. *FAR 52.225-11 BUY AMERICAN ACT—CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (JULY 2002) [For Contracts more than $6,481,000] ALTERNATE I (MAY 2002) [For Contracts between $6.481 and 7.304733 Million]

(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 componentsmanufactured 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	Lesotho
Belgium	Liechtenstein
Benin	Luxembourg
Bhutan	Malawi
Botswana	Maldives
Burkina Faso	Mali
Burundi	Mozambique
Canada	Nepal
Cape Verde	Netherlands
Central African Republic	Niger
Chad	Norway
Comoros	Portugal
Denmark	Rwanda
Djibouti	Sao Tome and Principe
Equatorial Guinea	Sierra Leone
Finland	Singapore
France	Somalia
Gambia	Spain
Germany	Sweden

Greece	Switzerland
Guinea	Tanzania U.R.
Guinea-Bissau	Togo
Haiti	Tuvalu
Hong Kong	Uganda
Iceland	United Kingdom
Ireland	Vanuatu
Israel	Western Samoa
Italy	Yemen
Japan	

"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.

"North American Free Trade Agreement country" means Canada or Mexico.

"North American Free Trade Agreement country construction material" means a construction material that—

(1) Is wholly the growth, product, or manufacture of a North American Free Trade Agreement (NAFTA) 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 NAFTA 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, U.S. territories and possessions, Puerto Rico, the Northern Mariana Islands, and any other place subject to U.S. jurisdiction, but does not include leased bases.

(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 the North American Free Trade Agreement (NAFTA) apply to this acquisition. Therefore, the Buy American Act restrictions are waived for designated country and NAFTA country construction materials.

(2) The Contractor shall use only domestic, designated country, or NAFTA 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).]*

(End of clause)

Alternate I (May 2002). As prescribed in 25.1102(c)(3), delete the definitions of "North American Free Trade Agreement country" and "North American Free Trade Agreement country construction material" from the definitions in 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:

(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 applies to this acquisition. Therefore, the Buy American Act restrictions are waived for designated country construction materials.

(2) The Contractor shall use only domestic or designated country construction material in performing this contract, except as provided in paragraphs (b)(3) and (b)(4) of this clause.

62. *FAR 52.225-12 NOTICE OF BUY AMERICAN ACT REQUIREMENT—CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (MAY 2002) [Applicable with FAR 52.225-11] ALTERNATE II (MAY 2002) [For Contracts Between 6.481 and 7.304733 Million]

(a) *Definitions.* "Construction material," "designated country construction material," "domestic construction material," "foreign construction material," and "NAFTA 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 NAFTA 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 NAFTA 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 NAFTA country construction material, and the offeror shall be required to furnish such domestic, designated country, or NAFTA 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 (MAY 2002) **[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*. "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 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 or designated 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 or designated country construction material, and the offeror shall be required to furnish such domestic or designated 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.

63. *FAR 52.225-13 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (JULY 2000)

(a) The Contractor shall not acquire, for use in the performance of this contract, any supplies or services originating from sources within, or that were located in or transported from or through, countries whose products are banned from importation into the United States under regulations of the Office of Foreign Assets Control, Department of the Treasury. Those countries are Cuba, Iran, Iraq, Libya, North Korea, Sudan, the territory of Afghanistan controlled by the Taliban , and Serbia (excluding the territory of Kosovo).

(b) The Contractor shall not acquire for use in the performance of this contract any supplies or services from entities controlled by the government of Iraq.

(c) The Contractor shall insert this clause, including this paragraph (c), in all subcontracts.

(End of clause)

64. DFARS 252.226-7001 UTILIZATION OF INDIAN ORGANIZATIONS AND INDIAN-OWNED ECONOMIC ENTERPRISES--DOD CONTRACTS (SEP 2001)

(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.

(b) The Contractor shall use its best efforts to give Indian organizations and Indian-owned economic enterprises 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 or Indian-owned economic enterprise 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 the--

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. No incentive payment will be made--

(1) Within 50 working days of subcontract award;
(2) While a challenge is pending; or
(3) If a subcontractor is determined to be an ineligible participant.

(e)(1) The Contractor, on its own behalf or on behalf of a subcontractor at any tier, may request an adjustment under the Indian Incentive Program to the following:

(i) The estimated cost of a cost-type contract.
(ii) The target cost of a cost-plus-incentive-fee contract.
(iii) The target cost and ceiling price of a fixed-price incentive contract.
(iv) The price of a firm-fixed-price contract.

(2) The amount of the adjustment that may be made to the contract is 5 percent of the estimated cost, target cost, or firm-fixed price included in the subcontract initially awarded to the Indian organization or Indian-owned economic enterprise.

(3) The Contractor has the burden of proving the amount claimed and must assert its request for an adjustment prior to completion of contract performance.

(4) 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 amount paid to the subcontractor.

(5) If the Contractor requests and receives an adjustment on behalf of a subcontractor, the Contractor is obligated to pay the subcontractor the adjustment.

(f) The Contractor shall insert the substance of this clause, including this paragraph (f), in all subcontracts that--

(1) Are for other than commercial items; and
(2) Are expected to exceed the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation.

(End of clause)

65. *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.

66. *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.

67. *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.

68. 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)

69. 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

70. 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.

71. *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.

72. *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.

73. *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.

74. *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.

75. 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: _____

76. *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)

77. 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.

78. RESERVED

79. 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)

80. *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)

81. *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)

82. 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.

83. *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.

84. RESERVED.

85. *FAR 52.232-10 PAYMENTS UNDER FIXED-PRICE ARCHITECT-ENGINEER CONTRACTS (AUG 1987)

(a) Estimates shall be made monthly of the amount and value of the work and services performed by the Contractor under this contract which meet the standards of quality established under this contract. The estimates shall be prepared by the Contractor and accompanied by any supporting data required by the Contracting Officer.

(b) Upon approval of the estimate by the Contracting Officer, payment upon properly executed vouchers shall be made to the Contractor, as soon as practicable, of 90 percent of the approved amount, less all previous payments; provided, that payment may be made in full during any months in which the Contracting Officer determines that performance has been satisfactory. Also, whenever the Contracting Officer determines that the work is substantially complete and that the amount retained is in excess of the amount adequate for the protection of the Government, the Contracting Officer may release the excess amount to the Contractor.

(c) Upon satisfactory completion by the Contractor and acceptance by the Contracting Officer of the work done by the Contractor under the "Statement of Architect-Engineer Services", the Contractor will be paid the unpaid balance of any money due for work under the statement, including retained percentages relating to this portion of the work. Upon satisfactory completion and final acceptance of the construction work, the Contractor shall be paid any unpaid balance of money due under this contract.

(d) Before final payment under the contract, or before settlement upon termination of the contract, and as a condition precedent thereto, the Contractor shall execute and deliver to the Contracting Officer a release of all claims against the Government arising under or by virtue of this contract, other than any claims that are specifically excepted by the Contractor from the operation of the release in amounts stated in the release.

(e) Notwithstanding any other provision in this contract, and specifically paragraph (b) of this clause, 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. (End of clause)

86. *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.

87. *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.

88. *FAR 52.232-26 PROMPT PAYMENT FOR FIXED-PRICE ARCHITECT-ENGINEER CONTRACTS (FEB 2002)

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) of this clause concerning payments due on Saturdays, Sundays, and legal holidays.)

(a) *Invoice payments*—(1) *Due date.* The due date for making invoice payments is—

(i) For work or services completed by the Contractor, the later of the following two events:

(A) The 30th day after the designated billing office receives a proper invoice from the Contractor (except as provided in paragraph (a)(1)(iii) of this clause).

(B) 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 settlement.

(ii) The due date for progress payments is the 30th day after Government approval of Contractor estimates of work or services accomplished.

(iii) If the designated billing office fails to annotate the invoice or payment request with the actual date of receipt at the time of receipt, the payment due date is the 30th day after the date of the Contractor's invoice or payment request, provided the designated billing office receives a proper invoice or payment request 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)(x) of this clause. If the invoice does not comply with these requirements, the designated billing office will 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) Taxpayer Identification Number (TIN). The Contractor shall include its TIN on the invoice only if required elsewhere in this contract.

(ix) Electronic funds transfer (EFT) banking information.

(A) The Contractor shall include EFT banking 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.

(x) 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, Government acceptance or approval is deemed to occur constructively as shown in paragraphs (a)(4)(i)(A) and (B) of this clause. 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, Contractor compliance with a contract provision, or requested progress payment amounts. 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.

(A) For work or services completed by the Contractor, Government acceptance is deemed to occur constructively on the 7th day after the Contractor completes the work or services in accordance with the terms and conditions of the contract.

(B) For progress payments, Government approval is deemed to occur on the 7th day after the designated billing office receives the Contractor estimates.

(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 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 is 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.

(iii) The additional penalty does not apply to payments regulated by other Government regulations (*e.g.,* payments under utility contracts subject to tariffs and regulation).

(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) *Overpayments.* If the Contractor becomes aware of a duplicate payment or that the Government has otherwise overpaid on an invoice payment, the Contractor shall immediately notify the Contracting Officer and request instructions for disposition of the overpayment. (End of clause)

89. *FAR 52.232-27 PROMPT PAY FOR CONSTRUCTION CONTRACTS (FEB 2002)

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 payment or that the Government has otherwise overpaid on an invoice payment, the Contractor shall immediately notify the Contracting Officer and request instructions for disposition of the overpayment.

(End of clause)

90. *FAR 52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER –CENTRAL CONTRACTOR REGISTRATION (MAY 1999)

(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 prompt payment*. A payment shall be deemed to have been made in a timely manner in accordance with the prompt payment terms of this contract if, in the EFT payment transaction instruction released to

the Federal Reserve System, the date specified for settlement of the payment is on or before the prompt payment due date, provided the specified payment date is a valid date under the rules of the Federal Reserve System.

(h) *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 in the CCR database and shall be paid by EFT in accordance with the terms of this clause. 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.

(i) *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.

(j) *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)

91. 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)

92. 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)

93. *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.

94. *FAR 52.233-1I DISPUTES (JULY 2002) ALTERNATE I (DEC 1991)

(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 that 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 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 or relating to the contract, and comply with any decision of the Contracting Officer. (End of clause)

95. *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.

96. RESERVED.

97. 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.

98. *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.

99. *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.

100. *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.

101. 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.

102. *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.

103. *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.

104. 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.

105. *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.

106. *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.

107. *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.

108. *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.

109. 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.

110. *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.

111. 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.

112. *FAR 52.236-23 RESPONSIBILITY OF THE ARCHITECT-ENGINEER CONTRACTOR (APR 1984)

(a) The Contractor shall be responsible for the professional quality, technical accuracy, and the coordination of all designs, drawings, specifications, and other services furnished by the Contractor under this contract. The Contractor shall, without additional compensation, correct or revise any errors or deficiencies in its designs, drawings, specifications, and other services.

(b) Neither the Government's review, approval or acceptance of, nor payment for, the services required under this contract shall be construed to operate as a waiver of any rights under this contract or of any cause of action arising out of the performance of this contract, and the Contractor shall be and remain liable to the Government in accordance with applicable law for all damages to the Government caused by the Contractor's negligent performance of any of the services furnished under this contract.

(c) The rights and remedies of the Government provided for under this contract are in addition to any other rights and remedies provided by law.

(d) If the Contractor is comprised of more than one legal entity, each such entity shall be jointly and severally liable hereunder. (End of clause)

113. *FAR 52.236-24 WORK OVERSIGHT IN ARCHITECT-ENGINEER CONTRACTS (APR 1984)

The extent and character of the work to be done by the Contractor shall be subject to the general oversight, supervision, direction, control, and approval of the Contracting Officer. (End of clause)

114. *FAR 52.236-25 REQUIREMENTS FOR REGISTRATION OF DESIGNERS (APR 1984)

The design of architectural, structural, mechanical, electrical, civil, or other engineering features of the work shall be accomplished or reviewed and approved by architects or engineers registered to practice in the particular professional field involved in a State or possession of the United States, in Puerto Rico, or in the District of Columbia. (End of clause)

115. *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.

116. 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.

117. *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.

118. *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.

119. 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)

120. *FAR 52.243-1 CHANGES--FIXED-PRICE (AUG 1987) ALTERNATE III (AUG 1984)

(a) The Contracting Officer may at any time, by written order, and without notice to the sureties, if any, make changes within the general scope of this contract in the services to be performed.

(b) If any such change causes an increase or decrease in the cost of, or the time required for, performance of any part of the work under this contract, whether or not changed by the order, the Contracting Officer shall make an equitable adjustment in the contract price, the delivery schedule, or both, and shall modify the contract.

(c) The Contractor must assert its right to an adjustment under this clause within 30 days from the date of receipt of the written order. However, if the Contracting Officer decides that the facts justify it, the Contracting Officer may receive and act upon a proposal submitted before final payment of the contract.

(d) If the Contractor's proposal includes the cost of property made obsolete or excess by the change, the Contracting Officer shall have the right to prescribe the manner of the disposition of the property.

(e) Failure to agree to any adjustment shall be a dispute under the Disputes clause. However, nothing in this clause shall excuse the Contractor from proceeding with the contract as changed.

(f) No services for which an additional cost or fee will be charged by the Contractor shall be furnished without the prior written authorization of the Contracting Officer. (End of clause)

121. 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.

122. 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.

123. 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)

124. *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)

125. *FAR 52.244-4 SUBCONTRACTORS AND OUTSIDE ASSOCIATES AND CONSULTANTS (ARCHITECT-ENGINEER SERVICES) (AUG 1998)

Any subcontractors and outside associates or consultants required by the Contractor in connection with the services covered by the contract will be limited to individuals or firms that were specifically identified and agreed to during negotiations. The Contractor shall obtain the Contracting Officer's written consent before making any substitution for these subcontractors, associates, or consultants. (End of clause)

126. FAR 52.244-6 SUBCONTRACTS FOR COMMERCIAL ITEMS (MAY 2002)

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

"Commercial item" has the meaning contained in the clause at 52.202-1, 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 (Oct 2000) (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 (June 2000) (46 U.S.C. Appx 1241) (flowdown not required for subcontracts awarded beginning May 1, 1996).

(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)

127. *FAR 52.245-2 GOVERNMENT PROPERTY (FIXED-PRICE CONTRACTS) (DEC 1989) [<u>For Government Property over $100,000</u>]

(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) Final accounting and disposition of Government property. Upon completing this contract, or at such earlier dates as may be fixed by the Contracting Officer, the Contractor shall submit, in a form acceptable to the Contracting Officer, inventory schedules covering all items of Government property (including any resulting scrap) not consumed in performing this contract or 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 the Contracting Officer directs.

(j) Abandonment and restoration of Contractor's premises. Unless otherwise provided herein, the Government--

(1) May abandon any Government property in place, at which time all obligations of the Government regarding such abandoned property shall cease; and

(2) Has no obligation to restore or rehabilitate the Contractor's premises under any circumstances (e.g., abandonment, disposition upon completion of need, or upon contract completion). However, if the Government-furnished property (listed in the Schedule or specifications) 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, its territories, or possessions, 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.

128. *FAR 52.245-4 GOVERNMENT-FURNISHED PROPERTY (SHORT FORM) (APR 1984) [For Government Property $100,000 or Less]

(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, its territories, or possessions, 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.

129. *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.

130. *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.

131. 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.

132. 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.

133. 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)

134. *FAR 52.249-2 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) 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 45.6 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.

135. *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.

136. 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.

137. 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
5/00, Rev 9/02

PART 1 GENERAL

Attachments:

General Wage Decision Nos.CO020006

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 540 calendar days (which includes design, design reviews and all construction activities). The time stated for completion of the project shall include final cleanup of the premises. (FAR 52.211-10)

1.1.1 Sequence of Design-Construction

(a) After receipt of the Contract Notice to Proceed (NTP), the Contractor shall initiate design, comply with all design submission requirements as covered in Division 01 General Requirements of the advertised Solicitation, and obtain Government review of each submission. No construction may be started until the Government reviews the 100 Percent Corrected Design submission of each package and determines it satisfactory for purposes of beginning construction. The Contractor shall submit two (2) separate complete design packages (design analysis, plans, specifications and other design deliverables). The first design package shall be for the site work, foundations, and utilities and the other shall be submitted for all other work. Each package will require the same design submittals (60%, 100% and Corrected 100%), design reviews and design review conferences as set forth in the Contract. Concurrent with the submittal for 100% design of the site, foundations and utilities, the contractor shall submit the 60% design package for all other work under the contract. The Government will not grant any time extension for any design resubmittal required when, in the opinion of the Contracting Officer, the initial submission failed to meet the minimum quality requirements as set forth in the Contract.

(b) After the Government reviews the Corrected Final for the site work, foundations, and utilities and conformance is agreed upon, the contractor will be given NTP on constructing the site, foundations and utilities work. Likewise, when the Corrected Final for all other work is reviewed and conformance is met, NTP with construction on the remaining work will be given. If the Government allows the Contractor to proceed with limited construction based on pending minor revisions to the reviewed 100 Percent Corrected Design submissions, no payment will be made for any in-place construction related to the pending revisions until they are completed, resubmitted and are satisfactory to the Government.

1.1.2 Application of “Value Engineering” Clause

Contract Clauses clause “Value Engineering” is only applicable to changes to RFP criteria requirements approved by the Contracting Officer, where there are cost savings to the Government. Any other changes, resulting in cost savings, which meet or exceed the requirements of the RFP, are not applicable to the Value Engineering clause.

1.2 LIQUIDATED DAMAGES-CONSTRUCTION (SEPT 2000)

(a) If the Contractor fails to complete the work within the time specified in the contract , the Contractor shall pay liquidated damages to the Government in the amount of $790.00 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 DESIGN-BUILD CONTRACT - ORDER OF PRECEDENCE

(a) The contract includes the standard contract clauses and schedules current at the time of contract award. It entails (1) the solicitation in its entirety, including all drawings, cuts, and illustrations, and any amendments, and (2) the successful offeror's accepted proposal. The contract constitutes and defines the entire agreement between the Contractor and the Government. No documentation shall be omitted which in any way bears upon the terms of that agreement.

(b) In the event of conflict or inconsistency between any of the provisions of this contract, precedence shall be given in the following order:

(1) Betterments: Any portion of the accepted proposal, which both conform to and exceed the provisions of the solicitation. "Betterment" is defined as any product, component, or system, which exceeds the requirements stated in the solicitation.

(2) The provisions of the solicitation. (See also Contract Clause entitled "SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION".)

(3) All other provisions of the accepted proposal.

(4) Any design products including, but not limited to, plans, specifications, engineering studies and analyses, shop drawings, equipment installation drawings, etc.. These are "deliverable" under the contract and are not part of the contract itself. Design products must conform with all the provisions of the contract, in the order of precedence herein.

(c) Where conflicts between the solicitation requirements and the UFGS guide specifications (available as indicated in Section 01332

DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES) exist, the solicitation requirements shall take precedence. Any installation requirements within solicitation requirements, but not contained in the UFGS guide specifications, shall be added to the specifications or shown on the drawings.

1.5 RESPONSIBLITY OF THE CONTRACTOR FOR DESIGN

(a) The Contractor shall be responsible for the professional quality, technical accuracy, and the coordination of all designs, drawings, specifications, and any other non-construction services furnished by the Contractor under this contract. The Contractor shall, without additional compensation, correct or revise any errors or deficiency in its designs, drawings, spececifications, and other non-construction services.

(b) Neither the Government's review, approval or acceptance of, nor payment for, the services required under this contract shall be construed to operate as a waiver of any rights under this contract or any cause of action arising out of the performance of this contract, and the Contractor shall be and remain liable to the Government in accordance with applicable law for all damages to the Government caused by the Contractor's negligent performance of any of the services described in paragraph (a) furnished under this contract.

(c) The rights and remedies of the Government provided under this contract are in addition to any other rights and remedies provided by law.

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 contract drawings (i.e., bid drawings that have been posted with all amendment changes) are mailed to the Contractor. See Section 01040 As-Built Drawings for drawings being furnished to the Contractor. 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 NOTIFICATION OF DISCREPANCIES

The Contractor shall check all drawings 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.

1.6.3 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 01330SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Equipment Room Drawings; G-AO.

This submittal is not required during construction, if equipment room drawings are shown on the 100 percent design submittal.

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 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 PAYMENT

1.9.1 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 Project Manager.

1.9.2 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.

1.9.3 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. (List additional items for which payments will be made for off-site delivery.) (EFAR 52.232-5000)

1.10 AVAILABILITY OF UTILITY SERVICES

All reasonably required amounts of domestic water and electricity will be made available to the Contractor by the Government from existing system outlets and supplies. The Contractor shall, at his own expense, make all temporary connections and install distribution lines. 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 electrical systems. The Contractor shall make arrangements with the Using Service, through the Contracting Officer, as to the method of determining the amount of water and electricity to be used by him and the method of payment therefor. . 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.

1.11 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.

1.11.1 Advance Notice

The Contractor shall submit written notification not less than 5 working 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.

1.11.2 Overtime Work by Base Operating and Maintenance (O&M) Personnel

The normal working hours for Government O&M personnel whose services may be required for utility outages or similar services are from 7:30 a.m. to 4:00 p.m. Overtime work by Government O&M personnel due to Contractor delays in scheduled outages, interruptions of known utility services, or other negligent acts, shall be the responsibility of the Contractor. The Contractor shall pay the Government for such additional overtime costs at the existing overtime wage rates established for the Government personnel involved.

1.11.3 Buried Utilities

The Contractor shall coordinate all excavation work including excavation for sign posts, fence posts, and utility poles with the Using Service Facilities Engineer and the telephone company prior to beginning work.

1.12 DIGGING PERMITS AND ROAD CLOSINGS

The Contractor shall allow 14 calendar days from date of written application to receive permission to dig and to close roads. Roads shall only be closed one lane at a time and vehicular traffic shall be allowed to pass through the construction area. 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. Work located along the alert force route shall not cause blockage and the Contractor shall maintain unobstructed access for alert force traffic at all times.

1.13 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
(08)	(05)	(04)	(04)	(06)	(04)	(07)	(05)	(03)	(02)	(03)	(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)

1.14 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)

1.15 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)

1.15.1 Contractor Employees Requiring Access to Automated Information Systems (AIS)

All Contractor 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. http://www.gsa.gov/Portal/formslibrary.jsp?type=doc&view=(ByNumber)&doc=25292D2D26D8B5EC

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 85P 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 District Contract Office (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.

(End of Provision) (PIL 2003-06, 19 Feb 03)

1.16 VEHICLE IDENTIFICATION (FT. CARSON)

All privately owned vehicles (including Contractor pickups, but not heavy equipment or trailer towed equipment) shall be registered while working on post. Contractor personnel shall register their vehicles at the M.P. Vehicle Registration Trailer any work day between the hours of 0700-1115 and 1300 to 1600. A safety inspection will be required and each vehicle owner will need to show (1) a valid driver's license, (2) a current vehicle registration, and (3) proof of automobile liability insurance.]

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

In order to closely coordinate work under this contract, the Contractor shall prepare a written agenda/meeting minutes and attend a weekly coordination meeting with the Contracting Officer and Using Service at which time 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 innformation that is needed in the minutes of the meeting. Required temporary utility services, time and duration of 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 the temporary sign in the location selected by the Contracting Officer near the project site. 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" will be furnished the Contractor upon request.

1.24 EQUIPMENT ROOM DRAWINGS

Prior to construction, the Contractor shall prepare and submit room plans (see paragraph SUBMITTALS for conditions regarding this submittal under

Design/Build procurement) 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. All equipment shall be accessible and laid out in a good design and workmanship manner and layouts for communications rooms shall be completed as early as possible. 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 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)

1.27 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 Area or Resident Office (as directed).

1.28 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.

1.29 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.

1.30 DRAWING SCALES

All scales shown on the RFP project drawings 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.

1.31 WAGE RATE APPLICATION

Applicable to all work. See attachment at the end of this section for Wage Determinations.

1.32 (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
10.9	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 Colorado Springs SMSA-1720, which El Paso Co. is a part of.

1.33 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.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

General Decision Number CO020006
Superseded General Decision No. CO010006
State: Colorado Construction Type:
BUILDING County(ies):
EL PASO 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	03/01/2002
1	03/08/2002
2	04/05/2002
3	05/03/2002
4	06/21/2002
5	07/05/2002
6	08/16/2002
7	01/10/2003
8	01/17/2003

COUNTY(ies):
EL PASO BRCO0007B 05/01/2002

	Rates	Fringes
BRICKLAYERS	21.27	6.60

CARP0001E 05/01/2002

	Rates	Fringes
CARPENTERS:		
All Other Work (Including Formbuilding/Formsetting)	20.70	6.10

ELEC0113B 01/01/2003

	Rates	Fringes
ELECTRICIANS (Including Low Voltage Wiring and Installation of Fire Alarms, Computers, Telephones and Temperature Controls)	24.10	3%+10.59

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* ELEV0025B 01/01/2003

	Rates	Fringes
ELEVATOR CONSTRUCTORS	26.935	9.355+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; Thanksgiving Day; Friday after Thanksgiving Day; and Christmas Day.

ENGI0009E 05/01/2002

	Rates	Fringes
POWER EQUIPMENT OPERATORS:		
Backhoe, under 3/4 yd.	19.92	5.47
Backhoe, 3/4 yd. and over	20.07	5.47
Cranes		
50 tons and under	20.07	5.47
51 to 90 tons	20.22	5.47
91 to 140 tons	20.37	5.47
141 tons and over	21.13	5.47
Front End Loader:		
up to and including 6 cy	19.92	5.47
over 6 cubic yards	20.07	5.47
Belt & Elevating	20.37	5.47
Roller:		
self-propelled, rubber tires under 5 tons	19.57	5.47
self-propelled, all types over 5 tons	19.92	5.47
Scraper:		
single bowl under 40 cubic yards	20.07	5.47
single bowl including pups 40 cubic yards and over and tandem bowls	20.22	5.47
Water Wagon	20.07	5.47
Trackhoe	20.07	5.47

IRON0024E 08/01/2002

	Rates	Fringes
IRONWORKERS, Structural and Reinforcing	22.00	5.75

LABO0720B 05/01/2002

	Rates	Fringes
LABORERS:		
Common and Concrete/Mason Tenders	13.50	4.23

PAIN0930A 07/01/2002

	Rates	Fringes
GLAZIERS	25.00	5.55

PLAS0577C 05/01/2002

	Rates	Fringes
CEMENT MASONS/ CONCRETE FINISHERS	21.90	5.12

PLUM0058A 07/01/2002

	Rates	Fringes
PIPEFITTERS (Including HVAC pipe)& PLUMBERS (Excluding HVAC work):	24.95	7.40

ROOF0058A 11/01/2002

	Rates	Fringes
ROOFERS	17.00	3.42

SHEE0009A 07/01/2002

	Rates	Fringes
SHEET METAL WORKERS (Includes HVAC duct and installation of HVAC systems)	24.94	9.65

SUCO1014A 12/20/2001

	Rates	Fringes
CARPENTERS:		
Acoustical	15.02	.76
Drywall Framing/Hanging and Metal Stud Work	15.16	2.33
DRYWALL FINISHERS/TAPERS	14.42	.62
MECHANICAL INSULATORS/ ASBESTOS WORKERS (Including application of all insulating materials, protective coverings,		

coatings and finishings to all types of mechanical systems)	13.88	
PAINTERS:		
Brush, Roller & Spray	11.29	3.11

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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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 (29 CFR 5.5(a)(1)(ii)).

In the listing above, the "SU" designation means that rates listed under that 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, D. C. 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, D. C. 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, D. C. 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

CO020006-5
01/17/2003

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MAIN FIRE STATION
PN: 12365
FORT CARSON, COLORADO

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SECTION 01001

SUMMARY OF WORK

PART 1 SUMMARY OF WORK

1.1 FUNCTION

1.1.1 Fire Station

The new Main Fire Station will be located at Fort Carson, Colorado, and will provide a quality state of the art facility to enhance fire protection to the main cantonment area of the base. The new fire station will consolidate and integrate the various diverse functions necessary to support fire fighting capabilities at the Post, but that are currently spread out in separate inferior and undersized facilities. A new facility is required to provide a modern and more efficient atmosphere in which to perform fire firghting activities, adequately house fire fighters, administrative functions, and fire fighting equipment, and provide the required technical training .

The anticipated staffing for this facility is approximately 19 people. The facility will provide adequate support for equipment, administrative support, vehicle dispatching, 911 Dispatch Center, and other support areas.

The facility will be sited at the intersection of Prussman Boulevard and Wetzel Avenue, across the street from the existing main fire station, Building 1518. The new fire station site is an open grassed field that is currently part of Iron Horse Park and within the boundaries of the Parks and Recreation Area. The site is mostly flat, but some elevation is evident to the west along Prussman Boulevard. A drainage ditch exists along Wetzel Road. There is a row of mature existing trees lining Prussman Boulevard on the north side of the site, which will be retained. Utility lines and cathodic test stations are present on the site. Some utilities have been abandoned. A fibre optic lines currently runs diagonally across the site, but will be relocated by others. A foundation from a building formerly occupying the site may still be present.

The project consists of the construction of the new fire station, two bays are separate bid items; a separate, small, hazardous materials and generator building; apparatus aprons; drives; walks; parking lots and stalls; landscaping; a dumpster enclosure; mechanical and electrical equipment; and bid options: patio with grill; horseshoe court; and lighted bollards. New landscaping will include both irrigated and non-irrigated (xeriscape) plantings, rock and boulders, irrigated sod, and seeding. Trees, utilities, and any obstructions shall be removed as necessary to construct the new fire station.

Building 1518, the existing main fire station, may be removed as a bid option to the contract. Removal of the building will be complete.

1.1.2 Building Arrangement

Overall configuration of the facility is a linear arrangement with an L-shape for the Firemen sleeping and day areas, and is compatible with the surrounding buildings in the area. This facility consists of three major functional areas. These are the Administrative Support/911 Dispatch Center (on one end), the Apparatus Bays (in the center), and the Fireman Sleeping/Day areas (on one end). The main building access and fire fighting vehicle access is located on the Wetzel Avenue side of the site. This is also the front side of the building.

The facility will have visitor parking in front of the building. Apparatus Bays can also be accesses on the west side of the site on the back side of the building.

1.2 GOALS AND OBJECTIVES

Based on user interviews, predesign conference, and design charrettethe following goals were defined:

1.2.1 Codes

Building codes and life safety codes shall be met or exceeded. Applicable codes are listed in each section.

1.2.2 Building Durability

Materials and equipment will be chosen for their durability and minimum or nonexistent maintenance. The building design will conserve manmade resources and energy usage.

1.2.3 Changes to RFP Criteria Requirements

This Request for Proposal provides requirements expected of the design-build Contractor during the design and construction of this project.

The RFP drawings presents an overall design concept of the project, provides useful project information, establishes some definition of the systems to be used and incorporates requirements expected by the Using Service.

It shall be the responsibility of the design-build Contractor to assemble the best value-priced construction systems for this project that meet or exceed the design criteria set forth herein.

Offerors should not consider changes to RFP criteria requirements during proposal preparation . After contract award, any changes to the RFP criteria requirements require approval by the Contracting Officer.

See Section 01332 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES for additional requirements, paragraph 3.2 SPECIFICATIONS.

1.2.4 Sustainable Design and Development Technology

To the extent referenced in the solicitation, the Contractor shall provide a facility which utilizes sustainable design and development principles. Green building technology shall be incorporated into the design of this facility that will consider the use of skylights, passive solar, and solar

hot water heating, and other sustainable design and development (green) technolgies and features. The basic objectives are to:

1) Reduce consumption of energy, land and other non-renewable resources.

2) Minimize waste of materials, water, and other limited resources.

3) Consider the cost of energy dollars while creating livable, healthy and productive environments that maintain comfort, health, and safety for the people using the facility.

4) This facility shall meet the requirements of achieving at least a "Bronze" rating in accordance with the Sustainable Project Rating Tool (SPiRiT), Version 1.4.1 and incorporate as a minimum the features indicated as required and to achieve a "Bronze" rating. The contractor shall provide a summary documentation of all items and categories in SPiRiT whether incorporated or not. Items incorporated in the design shall be specifically identified. This documentation will be kept up to date at the various design submittals and through construction, and shall serve as a self-assessment and record for Fort Carson.

5)

Green Building Technology and Whole Building Design are referenced names involving sustainable design and development principles.

Related References:

ETL 1110-3-491 (31 January 2000) Sustainable Design for Military Facilities

SPiRiT, Version 1.4 Sustainable Project Rating Tool, April 2001

Web Sites to Consider for Sustainable Design and Development:

EPA Designated product (available at http://www.epa.gov/cpg)

Green Building Council: http://www.usgbc.org

Whole Building Design Guide: http://www.wbdg.org/

Energy Star Building Program - Eviromental Protection Agency: http:www.epa.gov/energystar/

Leadership in Energy and Environmental Design Green Building Rating System Criteria (LEED) U.S. Green Building Council: http://www.usgbc.org/programs.leed.htm

U. S. Department of Energy:

www.eren.doe.gov/buildings/build_design.html

1.3 FACILITY TYPE, AND SIZE

1.3.1 Facility Type

Adequately sized, configured, and centrally located fire station facility

at Fort Carson, Colorado.

1.3.2 Facility Size

The Fire Station project is programmed at 16,600 gross square feet, but the current design reflects a facility that is 17,314 gross square feet due to customer requirements not initially reflected in the initial programming documents.

1.4 PERSONNEL AND EQUIPMENT

The complete facility design shall provide facilities for a maximum of 19 full time employees and will be operational 24 hours per day, 7 days per week.

1.5 DRAWINGS

Functional concept drawings of the site area, floor plans, and elevations are included for use in developing this design.

1.6 OPERATION AND MAINTENANCE REQUIREMENTS

1.6.1 Operation and Maintenance Manuals

The intent of the O&M Manuals are to promote and maximize the efficiency, economy, safety, and effectiveness of the life cycle operation, maintenance, and repair of the facility. Operation and maintenance manuals as required by the UFGS Technical Specifications (Divisions 1 thru 16) to be edited by the contractor shall be provided.

1.6.2 Training

The Contractor shall provide operational and maintenance training for all systems furnished under this contract. The training will be for the operating and maintenance personnel. The training shall be put on by the system manufacturer. The training shall not take place until the operation and maintenance manuals are submitted and approved. The Contractor shall video tape the training session on VHS tapes and provide tapes to the Government.

1.7 OVERVIEW OF DESIGN-BUILD PROCESS

1.7.1 Overview

Since the early 1980s Congress has urged the military services to explore alternative construction methods, such as "Design-Build," which includes both design and construction under a single contract. This process is similar to "one-step turnkey selection procedures" and is defined in Title 10 of the United States Codes, Section 2862.

1.7.2 Process

The design-build process uses a Request for Proposal (RFP) to solicit for design and construction of a facility by a single contractual entity, such as a design-build firm, or joint venture between architect-engineer (A-E) and construction firm, or a construction management (CM) firm joint venture with an A-E and a construction firm. A design-build RFP states the project functional requirements, design and engineering criteria, technical performance specifications, and proposal evaluation factors. Potential contractors develop their proposals for the government to evaluate

competitively, with the contract award based on a combination of technical merit and price.

In general, the RFP is a conceptual design document and the design-build contractor is responsible for completing the design and constructing the project. The RFP has developed the site plan and building design and given the facility an architectural character. These designs, with minor deviations allowed for detailing and constructibility, must be carried through to construction. The design-build contractor is responsible for all other designs on the project, such as the HVAC system, as long as they fit within the established criteria, and can be built on time and within budget.

After award of the contract, the design-build contractor will prepare a series of design submittals for review by the Government, so that design and criteria compliance can be effectively monitored for compliance. After approval of the final design, construction can begin. On-site construction activities shall not begin until all final corrected plans, specifications and design analysis for the entire project have been approved by the Government.

1.8 DESIGN-BUILD CONTRACTOR REQUIRED A/E SERVICES

The following is a condensed summary of Section 01332, "DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES" contained elsewhere in this document. Refer to this Section for the full requirements.

1.8.1 Dimensions

Design, products and construction for the Firestation project shall be accomplished using english expressions of measurement. All measurements in the technical performance specifications sections are shown in english. Modular construction products are brick, concrete block, wallboard, plywood, suspended ceiling systems, recessed lighting, and other manufactured components with dimensions based upon a four (4) inch building module.

1.8.2 Professional Licenses

The award of contract will be made to one qualified contractual entity who will be responsible for design completion and the entire construction process for the facility. This contractual entity shall employ qualified building design professionals with appropriate state licenses.

1.8.3 Request For Proposal - Binding Information

The information contained in this Request for Proposal (RFP) shall be considered binding unless specifically waived by the Contracting Officer. The successful offeror's proposal, along with any clarifications and/or best and final offers are a binding part of this contract. Site design, building design, architectural character and engineering/performance criteria shall be implemented through construction by the design-build contractor.

1.8.4 Evaluation of Systems

As part of the basic services, the design-build contractor shall evaluate building systems and components for their possible inclusion into the design. If these systems and components meet the specified design and performance criteria in the RFP, they may then be incorporated into the

work.

1.8.5 Document Requirements

For a more detailed list of design and construction submittals, see Section 01332,
DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES.

1.8.5.1 Design documents at all stages of design include:

Construction drawings.

Specifications.

Design analysis narrative with calculations for all disciplines.

Magnetic media at the 100 percent corrected final design only.

Summary analysis of Sustainable Design and Development features and principles based on the SPiRiT rating system to achieve the rating category as previously defined. Explanation and costs of all categories and features included in this design will be documented. This will be an integral part of the Design Analysis.

1.8.5.2 Drawing Requirements

All design drawings shall be accomplished using english unit measurement. Prepare 28-inch x 40-inch full-size drawings and half-size drawings in accordance with the Omaha District CADD Standards Manual.

The design-build contractor shall submit the design at various stages of completion, plus the final documents, for review and comment. These stages are:

60 percent design submittal.

100 percent design submittal.

100 percent corrected final design.

1.8.5.3 60 Percent Design Requirements

Drawings, specifications, design analysis and calculations for all disciplines at an approximate 60 percent level of completion.

Color boards for SID. NOTE: SID package shall be final at the 60% submittal. The 100% submittal shall be updated as required.

1.8.5.4 100 Percent Design Requirements

Incorporate all comments from the 60 percent review.

Drawings, specifications, design analysis and calculations for all disciplines at 100 percent level of completion. All aspects of the project are complete.

Updated Color boards; SID.

1.8.5.5 100 Percent Corrected Final Design

Incorporate comments from the 100 percent design submittal.

Magnetic media.

1.9 COMMON DEFICIENCIES

Following are some common costly deficiencies to be avoided in the preparation of contract documents. Carefully compare the architectural design and contract documents with these requirements at several points in the design process to avoid unnecessary changes later.

Not using correct abbreviations or terminology on the drawings. Abbreviations must match what is used on the standard abbreviation sheet and terminology must match what is used in the standard guide specifications.

Not using the correct scales, north arrow designation, section cut system, or incomplete dimensioning on the drawings.

Not providing sufficient space for door operation hardware at doors which swing into a wall running perpendicular to the opening. 4-inch minimum is required between edge of door frame and perpendicular walls.

Not providing correct and complete Design Analysis information written in the present tense. The Design Analysis will be written following the format indicated in Section 01332 of the Request For Proposal. A separate Fire Protection section in the Design Analysis with input from all disciplines is one area which is often overlooked and shall be included.

Not providing a structural stoop at exterior doors where the slab is at the same approximate elevation as the interior floor. The use of simple slabs on exterior grade leads to lifting of the slab in below-freezing temperatures which interferes with the safe operation of the door.

Not correctly presenting or coordinating (to avoid interference) features of Fire Protection, Noise Control, and Physical Security.

Not correctly referencing and cross referencing building sections, wall sections, details, etc.

Failure to read/use Technical Notes in Guide Specifications.

Failure to coordinate all disciplines prior to submittal of projects for review.

Sealant details not identified by appropriate sealant type that relates to the specifications.

Improper use of fire-retardant wood. Fire-retardant wood is combustible; its use in buildings that are of noncombustible construction is extremely limited (see UBC for the minor allowable uses). Because of the potential for severe degradation, fire retardant plywood shall not be used in a roof or roofing system, or in structural applications.

Incorrectly listing trade names in door hardware specifications in lieu of ANSI numbers and failure to correctly specify hardware finishes.

Control joint in CMU walls are not shown on both architectural and structural plans, or are inconsistent and not coordinated. Brick expansion

joints not being properly shown on the floor plans and/or coordinated with the elevations.

Gutters and downspouts not being sized and indicated on the drawings. Snow guard protection not being shown, properly located, or detailed.

Failure to delete all publications from Guide Specifications which do not apply to the particular project.

North is not oriented the same direction on all sheets (civil, site, architectural).

Failure to properly edit and tailor Guide Specifications.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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SECTION 01002

SITE WORK

PART 1 GENERAL

1.1 REFERENCES

FORT CARSON

Fire Department Information Packet	Fort Carson Fire Department Development and Construction Information Packet

DEPARTMENT OF THE ARMY ENGINEERING MANUALS (EM)

EM-385-1-1	(3 Sept 1996) SAFETY AND HEALTH REQUIREMENT

DEPARTMENT OF THE ARMY TECHNICAL MANUALS (TM)

TM 5-820-4	(Oct 83) Drainage for Areas Other Than Airfields
TM 5-822-5	(June 92) Pavement Design for Roads, Streets Walks, and Open Storage Areas
TM 5-813-5	(3 Nov 86) Water Supply, Water Distribution [Ref: AFM 88-10, Vol 5]

DEPARTMENT OF THE ARMY TECHNICAL INSTRUCTIONS (TM)

TI 814-10	(3 Aug 98) Wastewater Collection

AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM)

ASTM D 977	(1991) Emulsified Asphalt
ASTM D 2027	(1976; R 1992) Cutback Asphalt (Medium-Curing Type)
ASTM D 2028	(1976; R 1992) Cutback Asphalt (Rapid-Curing Type)
ASTM D 2397	(1994) Cationic Emulsified Asphalt

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C651	(1992)Disinfecting Water Mains

FEDERAL STANDARDS (FED STD)

FED STD 795	(April 1988) Uniform Federal Accessibility Standards

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

NOAA ATLAS 2	(1973) Precipitation-Frequency Atlas of the Western United States

AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS (AASHTO)

AASHTO	A Policy on Geometric Design of Highways and Streets
AASHTO HB-16	(1996)Standard Specification for Highway Bridges

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

D6.1-1988	Manual on Uniform Traffic Control Devices for Streets & Highways

MILITARY HANDBOOKS (MH)

MIL-HDBK-1008C	(10 Jun 1997) Fire Protection for Facilities Engineering, Design, and Construction

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 24	Standard for the Installation of Private Fire Service Mains and Their Appurtenances, 1995 Edition
NFPA 291	Recommended Practice for Fire Flow Testing and Marking of Hydrants, 1995 Edition

NATIONAL ASSOCIATION OF PLUMBING-HEATING-COOLING CONTRACTORS

	National Standard Plumbing Code Illustrated, 1996 Edition

1.2 OMAHA DISTRICT CORPS OF ENGINEERS STANDARD DETAILS AND CADD CELLS.

The Omaha Districts Civil and Environmental standard details and CADD cells are available on the Omaha District FTP site. These standards and cells are available for the Contractor's use. References to using exact details and drawings are found in this section. In those cases, the Contractor shall use the referenced standard drawings and/or details.

1.3 SURVEY

The Contractor shall complete an engineering field survey of the project site. The survey shall use the Prussman and Wetzel Road Project survey as a base and Fort Carson's CADD base mapping files as a utility identification guide. Both the road survey and base mapping files will be provided to the Contractor in Microstation format. See Sheets C2.01 and C2.02. Survey of the new main Fire Station site shall be a complete engineering survey, including contours, spot elevations, and above and below ground utilities, sizes and inverts. The completed survey shall be used by the Contractor to prepare his design drawings for the new fire station. The mapping shall indicate the vertical and the horizontal datums used in the preparation of the surveys. Coordinates and elevations of all branch lines and changes in direction shall be documented. Survey data collected shall be provided to the Contracting Officer for use by Fort Carson. All new utilities shall be surveyed for location and elevation prior to backfilling. The survey shall be in English units and in Microstation format.

1.3.1 Ground Control

The ground control shall be developed with accuracy commensurate to support the mapping. The survey will be developed using the same datum and common monuments as the Prussman and Wetzel Road project.

1.3.2 Coordinate Listing

The horizontal coordinates of all control used or installed shall be provided in tabular form on 8-1/2" X 11" sheets. The coordinate system used shall be indicated and combination factor used shall be shown. Show coordinates in the appropriate state plane system at zero elevation. Include point number, N, E, elevation and datums.

1.3.3 Reference Ties

Provide descriptions showing at least 3 ties to all monuments set in the field. Approximate directions and a sketch shall illustrate measured distances. Coordinates and appropriate State Plane system designation shall be shown on the card. If field features (trees, posts, etc.) are not available for ties, then witness posts shall be set. Fence posts or carsonite markers are suitable for this purpose. You may submit ties on a form from your State Land Surveying society or company form as long as it contains the required data.

1.3.4 Control Report

Submit a bound report including coordinate listing, reference ties, GPS report, and narrative including basis of control.

1.3.5 Additional Survey

Survey required for the removal of Building 1518 and the new communication and electrical lines off of the immediate project site may be compiled from the survey data being provided to the Contractor. Data provided shall be field verified, adjusted and supplemented to the degree required to identifify all interferences, removals, and replacements required for construction and demolition. Survey shall be in English units and Microstation format.

1.3.6 Soil Borings

Soil borings have been taken. See attached Soil Report and Boring Logs/Location Drawing.

1.4 STAGING AND CONTRACTORS ACCESS

1.4.1 Staging Area

The location of the Contractor's staging and storage area shall be as shown on the drawings. Staging area shall be returned to its original condition upon completion of construction.

1.4.2 Contractors Access/Contractors Limits

Contractor's access route to the project location shall be as shown on the plans. Contractors parking areas shall be located near the staging area. The Contractor's limits of construction shall be directly within the area(s) of his work. Contractor's activities shall allow for emergency vehicle access and passage at all times.

1.4.3 Project Sign

Contractor shall provide project sign in accordance to Omaha District Standard Drawing C-8.10, PROJECT SIGN DETAILS.

1.5 DEMOLITION AND REMOVAL

1.5.1 Building Removal (Option Bid Item)

The removal of Building 1518, the existing main fire station, is an option bid item to the contract. The building demolition shall not begin until the new Main Fire Station is occupied and fully operational. Small amounts of asbestos will be removed by the Government prior to the Contractor's activity. Building 1518 is a wood structure located northwest of the new Main Fire Station location, across Prussman Boulevard, and is shown on both the attached Survey Plans and Site Plans. The building removal includes the removal of the building, utility service lines to the building, and the removal of drives, walks, and stoops, planters and signage that have the sole purpose of servicing the existing fire station. A generator located in the building shall be relocated by the Contractor to the new Hazarous Materials/Generator Building. See Section 01007 for additional electrical/communication equipment being relocated. The asphalt pavement on the northeast side of the building shall be cut, full depth, at the edge of the concrete pavement, approximately eighteen foot out from the building, and a turning radius cut at the intersection with Prussman Boulevard for traffic entering the theater and post office parking lots. Access to the parking lots will be kept open at all times. The demolition of the building shall be complete, including all footings and foundations. Upon completion of the removal, the site shall be fine graded for drainage and established with turf. See photos on Sheet C4.01.

1.5.2 Other Removals

The Contractor shall remove all pavements, utilities, trees, and other appurtenances necessary to construct the new facility as presented on the attached drawings. The foundation from a previously demolished Building No. 1800, remains on the site. The foundation is assumed to be reinforced, four foot high, 12-inch thick poured concrete walls with 24 inch-wide, 12 inch-thick, strip footings; see location and building footprint shown on

the drawing at the end of this section. The site has been used as a fill site in the past; see attached Foundation Analysis. A fibre optic cable running diagonally across the site (see Sheet EU.01 for location) will be relocated by others prior to construction start. They will not be removing the 6" conduit that the cable is running through. The Contractor shall remove any conduit that would be beneath the new fire station building or pavements if it were not removed or that may interfere with the installation of supporting utilities. Cathodic test stations located on the water line along Wetzel Avenue shall be relocated by the Contractor. Relocation shall be coordinated with Fort Carson. Stations are labeled as "vertical pipes" on the attached Road project survey drawing, Sheet C2.02.

Rubbish and debris from construction and demolition activities shall be removed from Government property daily to avoid accumulation at the project site.

1.5.3 Removal Requirements

Unless otherwise specified, disposal of all removed materials shall be outside the limits of Government controlled lands in accordance with federal, state, and local regulations. The Contractor shall notify the Contracting Officer if any material to be disposed of is found to contain hazardous, toxic, biological or radiological substances. Contaminated soils are not anticipated, but should they be encountered, the Contracting Officer shall be be notified immediately. Demolition shall conform to UFGS Section 02220A DEMOLITION.

1.6 NEW CONSTRUCTION

All new construction is located entirely within the limits of Government-controlled lands.

1.6.1 Buildings

Location and construction of the new Main Fire Station, including associated structures, parking, utilities and landscaping shall be as indicated on the attached drawings and as specified herein. The attached Site Plans are indicative of all Option Bid Items being awarded, including the two apparatus bay bid options. See architectural drawings. Should the one, or both, bay options not be awarded, the drives and apparatus aprons shall be down-sized by the width of a bay times the number of bays not awarded, and the site layout adjusted towards Prussman Boulevard. The new building shall be fully handicapped accessible. Minor changes to the layout may be accepted by the Government if it is beneficial to the overall design of the project.

1.6.2 Main Entrance

The main entrance walk shall a diagonal walk located between the visitor's parking stalls and the administrative offices. The walk shall have a pattern created by using 3.5 square walk sections, constructed along the walk's edge and by the placement of the contraction and expansion joints. Each square shall have a light swirled-broom finish, bordered with a four-inch smooth troweled edge. As an Option Bid Item to the contract, install nine (9) lighted precast concrete bollards along the diagonal of the walk and near the building entrance to illuminate the walk and highlight the entrance. The bollards shall precast concrete, and a minimum of 10 inches in diameter and 2.5 feet above grade. Contractor shall submit a detail of the bollards with the review drawings.

1.6.3 Walks.

Exterior concrete walks shall be placed at locations indicated on the Site Plan. Walks shall be 7 foot wide and have a light broom finish. Mimic the design and finish of the main entrance walk along the visitor's parking stalls on the north/northwest side of the building. Adjustments to the walk layout may be made to complement the final Site Plan.

1.6.4 Patio

A concrete patio approximately 18 by 22 feet shall be provided as shown on the attached site plan. The patio shall mimic the 3.5 foot square pattern and finish of the main walk. Also, see paragraph, "Screenwalls/Dumpster Enclosure," below. A gas barbeque grill shall be installed on the patio. See Section 01006 for requirements.

1.6.5 Asphalt Drives

Construct three new asphalt drives with concrete curb and gutter to access all of the parking areas and the front and rear apparatus bays and the rear of the building. One drive, shall access two separate parking lots on the north and northwest side of the building. The drive shall be diagonally configured, as shown in the attached drawings and transition to a 30 foot wide parrallel drive in the northwest parking lot. An extension of the drive shall provide a turn-around for the government vehicles and occasional parking for trailers. The second drive, to the parking stalls on the south and southwest side of the building and to the rear of the building, shall be 30 foot wide. Access to a dumpster enclosure and a turn-around for POV and large vehicles shall be provided off of the drive leading to the rear of the second drive. The third drive will provide access to the front apparatus bay and shall be the same width as the apparatus apron. All drives shall have sufficient radii to allow for the turning requirements of the vehicles being serviced. New drives shall meet and match elevation of Wetzel Avenue. Prussman Boulevard and Wetzel Avenue road project could be concurrent construction. Contractor shall coordinate Main Fire Station design and construction with the road design and construction.

1.6.6 Parking Areas

Provide three separate parking areas off of the drive leading to the rear of the building: one with five visitor's stalls; one with three stalls for the purpose of dropping off fire extinguishers; and, one with twenty stalls for privately-owned vehicles (POV.) Provide two separate parking lots off of one access drive on the north and northwest side building; one with four visitor's stalls; and one with eleven employee stalls, five for privately-owned vehicles and six for government-owned vehicles (GOV.) Designate one of the visitor's parking stalls for handicapped parking. Provide a "Van Accessible" sign with the international symbol of accessibility. Sign shall have white letters on a brown background. Provide a handicapped ramp onto the sidewalk. Ramp, striping and signage shall be in accordance with FED STD 795. Visitor's and POV stalls shall be 9-foot wide. GOV stalls and stalls for fire extinguisher drop off shall be 12-foot wide, and 24-foot deep. Visitor's stalls on the northwest side of building shall be 18-foot deep. All stalls on the north side of the building shall be 20-foot deep. All visitors and POV stalls on the south and southwest side of the building shall be 22-foot deep; the deeper stalls will allow for the safe passage of the large emergency vehicles. Provide a curb ramp in the island near the stalls designated for dropping off fire

extinguishers, and onto the walk next to the dumpster screenwall.

1.6.7 Apparatus Aprons

Curbed concrete apparatus aprons shall be provided on each side of the "drive-thru" apparatus bays. The layout as shown is indicative of both apparatus bay options being awarded. Should a bay option, or options, not be awarded, the width of the apron shall be down-sized by the width of a bay times the number of bays not awarded. The asphalt drives shall be adjusted likewise, The number, size, and configuration of parking stalls provided on the south and southwest side of the building shall remain unchanged. A wash rack (drain) shall be provided in the rear apparatus apron at the approximate location shown on the attached Site Plan. The apron shall extend to provide a drive to the mechanical and electrical rooms. Only very minor changes as required to facilitate the overall design, will be accepted.

1.6.8 Emergency Vehicle Manuevering

The design shall consider the path and maneuvering required by the emergency vehicles. See paragraph, "Design Traffic," below and Fort Carson's Fire Department Information Packet for vehicle information.

1.6.9 Equipment Pads/Flag Pole Foundation

Provide pads for mechanical equipment and an antenna. Locate equipment in the approximate locations shown on the attached Site Plan. See SECTIONS 01006 and 01007 for equipment and antenna information. Provide a foundation for a flag pole in front of the building among the plantings. Flag pole will be installed by others at a later date. Coordinate exact details and location for foundation with Fort Carson.

1.6.10 Screen Walls/Dumpster Enclosure

A three-foot high screen wall shall be provided to enclose the 18 foot x 22 foot patio. A decorative steel gate shall be provided to the walks. A dumpster pad with a four-sided screen wall enclosure shall also be provided. Screen walls shall be of CMU and brick construction. Brick shall match the building's exterior. Dumpster screen wall shall be a minimum of 14 feet wide by 11.33 feet deep by 7 foot high and have a one foot pedestrian opening on one side and an 8 foot-wide double-swing gate on the vehicle access side. The double-swing gate shall be finished with metal panels supported by heavy-duty hardware and have the capability of being held in the open position. The dumpster enclosure shall be located as shown on the Site Plan.

1.6.11 1.6.11 Hazardous Materials (HAZMAT)/Generator Building

A Hazardous Materials/Generator Building shall be located in the approximate location as shown on the Site Plan. The genrator shall be relocated from the existing fire station, Building 1518. See Section 01007 and Sheet AC.01 for further information.

1.6.12 Gazebo (Option Bid Item)

As an option bid item to this contract, provide a gazebo of metal construction with metal roof on a concrete slab. Roof and metal colors shall match the building's roof and trim colors. The gazebo shall be designed with an octogon or hexagon shape with a column footprint

approximately 20 foot across, and roof approximately 24 foot across with a 1:1 pitch. Gazebo shall have decorative steel ornamentation. See Site Plan for location.

1.6.13 Horseshoe Court (Option Bid Item)

Provide a horseshoe court as an option item. Court shall be designed as shown on the detail at the end of this section, including the concrete walkway, and constructed in the approximate area shown on the attached Site Plan.

1.6.14 Restricted Access

Signage shall be provided to restrict access to the POV/GOV parking lot on the north side of the building and onto the drive leading to the rear of the building. Contractor shall coordinate with the base on desired wording for the signage.

1.6.15 Landscaping

Landscape plan shall be designed to visually enhance the new facility with color, form and screening, while providing shade and windbreak for the new building. Trees and shrubs shown on the Site Plan are indicative of areas to be landscaped and do not necessarily type or quantify. Xeriscape plantings shall consist of low maintenance, low water plants shall be used in the plant beds or areas indicated as Xeriscape on the Site Plan. A plant irrigation system shall be provided to all plants and plant beds. Berms shall be used to accent the building and plant beds. Plants and berms shall not obstruct the view of emergency vehicles leaving the apparatus bay.

As a minimum, the Landscape Plan shall include the following plantings:

TYPE	MINIMUM QUANTITY	MINIMUM SIZE
TREES		
Deciduous Shade	6 each	3-4 inch caliper
Deciduous Ornamental	4 each	2 inch caliper
Conifers	3 each	8 foot high
SHRUBS		
Deciduous & Evergreen	48 each	5 gal container
PERIENNIALS	72 each	2 quart container
TALL GRASSES	5 each	2 gal container

Landscaping shall consist of balled and burlapped trees and container-grown shrubs. Plant materials shall be climatized to the local area for a period of one growing season prior to planting. Landscaping guidance and plant selection shall be made from those suggested in the plant list attached at the end of this section or from those proposed on the Colorado State Extension Service, web site, www.ext.colostate.edu/pubs/garden, and the Xeriscape Plant Guide, by Denver Water, American Water Works Association, Fulcrum Publishing. Contractor shall coordinate with local nurseries when developing the planting plan to ensure that chosen plants are readily

available, and are top performers, in the Colorado Springs area. Mulch trees to a minimum of 30 inches, beyond the tips of tree branches with a minimum of 4 inch depth of shredded cedar bark mulch. Shrub planting beds shall be surfaced with a 4 inch depth of 1 to 1-1/2 inch washed river gravel. Coordinate rock color with base personnel. Xeriscape beds shall have large rocks and boulders arranged in the planting scheme. Rocks shall range in size from 6 inches to four foot in diameter. A minimum of 36 larger rocks and boulders shall be provided, with at least 5 of the boulders being 3 foot in diameter and one four foot in diameter. Concrete edging shall be provided for the two plant beds on the front side of the building. Edging shall have a smooth troweled finish with chamfered edges and be 8 inches deep and 12 inches wide, with contraction and/or expansion joints at 7 foot on center. Plant beds on the rear side of the building shall be edged with commercial-quality black metal edging. Landscape plantings shall be specified in UFGS Section 02930a EXTERIOR PLANTING and UFGS Section 02935a EXTERIOR PLANTING MAINTENANCE.

1.6.16 Turf

a. Soil Preparation

Prior to seeding or sodding, all surface soils shall be loosened to a minimum depth of 12 inches and broken up to a fine, workable texture suitable for seeding and sodding. Areas within the limits of sod and irrigation shall have 3 cubic yards per 1000 square feet of a 50/50 mixture of peat moss and manure worked into the top 6 inches of soil.

b. Seeding and Sodding

Areas to be sodded are indicated on the attached Site Plan. All other areas, including those disturbed by contractor's staging activities, not otherwise surfaced, shall be seeded. All newly turfed areas shall be fertilized with no less than 200 lbs of 18-46-0 per acre of fertilizer. Seeding and sodding shall be specified in UFGS Sections 02921a SEEDING and 02922a SODDING.

c. Seeding

Seed Mixture

Mixture:	Pounds/acre
Buffalo Grass, 'Cody'	43
Blue Grama	15

Seeding rate above based on drill seeding, if broadcast double the amounts.

Moldy, or otherwise damaged seed shall be rejected. Seed mixing shall be performed by the seed supplier prior to delivery to the site. Bulk quantities of seed shall be labeled. All seeded areas shall be seeded by hydromulching techniques using 2000 lbs of green-tinted, wood-fiber hydromulch per acre , drilling with a Brillon-type seeder or broadcast seeded. All seeded areas shall be watered with a temporary watering system for a 90-day establishment period. Areas shall be watered as required for the ground to remain moist during the first three weeks of sprinkling. Beginning with the fourth week of sprinkling, the areas shall be watered every other day, delivering 1/2 inch of water to the ground for each water day, for the remainder of the ninty day period.

c. Sod

Sod shall be state-certified as classified by applicable state laws. Sod shall be locally grown and be comprised of a mixture of improved varieties of turf-type tall fescues. It shall be free of thatch, diseases, nematodes, soil-borne insects, weeds or undesirable plants, stones larger than 2 inchesin diameter woody plant roots and other material detrimental to a healthy stand of turf. Dry moldy, yellow, irregularly shaped, torn or uneven end sod pieces shall be rejected. Sod shall be machine cut to a uniform thickness of 1 inch within a tolerance of .25 inches, excluding top growth and thatch. Measurement for thickness shall exclude top growth and thatch. Sod anchors shall be used for sloped areas as recommended by the sod supplier.

1.6.17 Irrigation Sprinkler System

All sodded areas and landscape plantings shall be irrigated. The irrigation systems shall be specified in UFGS Section 02811A UNDERGROUND SPRINKLER SYSTEMS. See "Seeding" paragraph, above, for temporary lawn sprinkling requirements for seeded areas.

a. The irrigation system shall consist of standard, commercially-available components. The components shall be products of manufacturers regularly engaged in the manufacture of such items and shall essentially duplicate those that have been in satisfactory operation at Fort Carson for at least two years.

b. The sprinkler system shall be completely underground, automatically operated by a central sprinkler controller, and capable of providing a precipitation rate of no less than 2 inches of water over all lawn areas per week over a maximum period of 56 hours durining mainly the night time hours. The lawn sprinkler pop-up heads shall be designed to be adjustable for coverage and flow. Trees and shrub beds irrigation shall be designed to be on a separate bubbler irrigation section than lawn areas. Ground covers and small periennial plants shall be on separate pop-up spray sections from lawn areas. Install pipe casings under walks and pavements where irigation lines cross. Lawn spray heads shall not cross over into tree and shrub beds, walks, or pavements. No irrigation line shall be located within 4 feet of the building. Irrigation system shall operate through a backflow prevention device. Supply all necessary tools and equipment for complete installation. System shall include weather shut-off components to regulate irrigating lawns. System shall include sensors for wind, rain, and temperature and be remote compatible.

c. Head spacing shall not be more than the manufacturer's recommendations for the type and sizes of trees and shrubs installed and the area of turf to be sprinkled. The Contractor shall submit design calculations for review on this matter. The Contractor shall also provide design drawings that include typical head spacing, system layout, pipe size, layout, and pressures. All components shall be shown on the irrigation plans for review.

d. A reduced pressure principle backflow preventer shall be installed between the irrigation system and the potable water system. A strainer shall be installed upstream of the backflow preventer with a screening element compatible with the emitters or sprinkler heads used and as recommended by the manufacturer. Provide a self-draining, freeze-proof, shut-off valve upstream of the backflow preventer and strainer. Vacuum breakers shall not be used in lieu of the reduced pressure principle

backflow preventer. The system shall also be equipped with a quick coupler valve immediately outside the building for blowing water out of the system at the end of the season. The air connection shall be located downstream of the backflow preventer and strainer.

e. High points in the irrigation system shall be equipped with air vacuum relief valves.

1.7 CONSTRUCTION AREA/SAFETY FENCING

The Contractor shall maintain a construction area fence throughout the duration of the contract. Fence shall be 4 feet tall orange plastic with gates. The fence shall be located such that the entire project site is fenced. Upon completion of construction, all fence materials shall be disposed of outside the limits of Government-controlled lands.

1.8 TRAFFIC/WARNING LIGHTS

Provide for traffic signals at Prussman Boulevard and Wetzel Avenue Intersection to be controlled by the Dispatcher at the new fire station. Signals are currently controlled at the existing station, Building 1518. Conduit is being placed under the road intersection for this purpose. See Sheet C3.02 for location. A new traffic warning light shall be installed on Wetzel Avenue to warn traffic of emergency vehicles entering the road. The Wetzel Avenue light and lights to be placed on the building will also be controlled by the Dispatcher. See SECTION 01007 Electrical Requirements for additional information.

1.9 PAVEMENTS

1.9.1 Pavement Sections

The Contractor shall be responsible for design of all pavements using the information provided below. Design of pavement structures for roads and parking areas shall be determined by the Contractor using the methods described within TM 5-822-5. Pavement design calculation sheets for the procedures contained in TM 5-822-5 are included as an attachment. See end of the RFP, Attachment No. 4. Pavements for permanent installations shall be designed for a life of 25 years. Pavements at Fort Carson shall be designed for seasonal frost conditions. Soil data for pavement design shall be obtained from the attached Foundation Analysis. See end of the RFP, Attachment No. 1.

1.9.2 Design Traffic

a. Pavement for the Apparatus Aprons and shall be rigid p.c. concrete. Design shall be for a Class F Facility with a Traffic Category of IVA. The largest vehicle assigned to the facility is Truck #32, with a gross weight of 62,000 lbs, with a front axle weight of 18,000 lbs, mid axle weight of 22,000 lbs, and rear axle weight of 22,000 lbs.

b. Pavement for the drives accessing the rear of the building and the front apparatus apron shall be flexible hot-mix asphalt. The asphalt surface course shall be a minimum thickness of 3 inches. The largest vehicle utilizing the drives is Truck #32. Weights are provided in paragraph a, above.

c. Pavement for the Parking Area shall be flexible hot-mix asphalt with concrete curb and gutter. The asphalt surface course shall be a minimum thickness of2 inches.Design shall be for a Class F Facility with a traffic category of II. A portion of the parking area pavement will be used by garbage trucks to service the dumpster. Pavement design shall also support occasional traffic from snow plows.

1.9.3 Rigid Pavement Design Curves

Pavement design curves, Figures 12-1 and 12-2, are presented in Chapter 12 of TM 5-822-5 to determine the required thickness of plain concrete pavement. The curves in Figure 12-1 were developed assuming free edge stresses and shall be used for roads and streets and other pavements where wheel loads will repeatedly travel near or over the pavement edge. Edges of concrete pavement designed using this curve are not required to be thickened. The curves in Figure 12-2 were developed assuming 25 percent load transfer across pavement joints. Figure 12-2 shall be used for parking areas and storage areas where wheel loads will seldom travel near the pavement edge. Pavement edges shall not require thickening except at entrances where wheel loads repeatedly cross the pavement edge. Figure 12-2 may be used for roads and streets if the pavement edges are thickened.

1.9.4 Rigid Pavement Joint Layout

A typical joint layout for plain concrete road intersections is shown in Figure 13-1 of TM 5-822-5. A typical joint layout for plain concrete roads and parking areas is shown in Chapter 15 of TM 5-822-5. Spacing and layout of joints in plain concrete pavement shall be such that the number of slabs requiring reinforcement will be kept to a minimum. Odd-shaped slabs shall be reinforced in two directions normal to each other using a minimum of 0.05 percent of steel in both directions. The entire area of the slab shall be reinforced. An odd-shaped slab is considered to be one in which the longer dimension exceeds the shorter dimension by more than 25 percent or a slab which essentially is neither square nor rectangular. Odd-shaped slabs will generally be reinforced with steel welded wire fabric. Slabs in which a structure is placed shall also be reinforced with welded wire fabric. Each slab to be reinforced with welded wire fabric will be marked with an "R" on the joint layout plan. Details showing typical layout of joints at intersection as indicated in Figure 13-1 of TM 5-822-5 will be provided when applicable.

1.9.5 Sidewalks

P.C. concrete sidewalks shall be a minimum of 4 inches thick. Joint patterns for walks are discussed in paragraph, "Walks," above. Expansion joint spacing shall not exceed 40 feet.

1.9.6 Pavement Specifications

Sidewalks and pavements shall be constructed in accordance with Colorado Highway Specifications where indicated. Unless otherwise specified, unit price clauses shall be deleted. These requirements shall be incorporated into the Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS. An unedited copy of Section 02560 is included at the end of RFP, Attachment No. 3B. The Contractor shall be responsible for editing this specification.

1.9.6.1 Bituminous Wearing and Intermediate Courses

Bituminous wearing and intermediate courses shall conform to the requirements in the Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS. The maximum size aggregate used in bituminous concrete shall be approximately equal to, but always less than 1/2 inch for the wearing course thickness and 3/4 inch for the intermediate course thickness. The total thickness of bituminous concrete shall not be less than 2 inches. Where the total thickness of bituminous concrete requires more than one lift, an intermediate course may be specified beneath the wearing course.

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 larger than the No. 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 No. 4 sieve. 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 amphibloles 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.

1.9.6.2 Bituminous Prime Coat

A bituminous prime coat shall be used at the option of the Contractor. Bituminous prime coat will be used when it is anticipated that the constructed base course may be damaged by rain, wind, or traffic prior to placement of the bituminous concrete pavement. Bituminous prime coat shall conform to the requirements found in Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS. Bituminous prime coat shall be: liquid asphalt conforming to the requirements of ASTM D 2027, designation MC-30 or MC-70, at the Contractor's option, except that only MC-30 shall be used on dense graded base courses if MC-70 does not adequately penetrate the base course material. In leu of cut-back asphalt, the Contractor may use cationic emulsified asphalt conforming to the requirements of ASTM D 2397, designation CSS-1 or CSS-1h.

1.9.6.3 Bituminous Tack Coat

Contact surfaces of previously constructed pavement, curbs, manholes, and other structures shall be sprayed with a thin coat of bituminous material conforming to the requirements found in Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS. Unless otherwise directed or required, bituminous material shall be emulsified asphalt conforming to the requirements of ASTM D 977, designation SS-1 or SS-1h or cationic emulsified asphalt conforming to the requirements of ASTM D 2397, designation CSS-1 or CSS-1h.

1.9.6.4 Crushed Aggregate Base Course

Aggregate base course shall conform to the requirements found in Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS and shall have a California Bearing Ratio (CBR) of at least 80.

1.9.6.5 Subbase and Rigid Base Courses

Rigid pavement base course shall be placed directly underneath concrete and subbase course shall be placed beneath the crushed aggregate base course. Rigid base and subbase shall serve as a separation and/or filter layer and shall conform to the requirements found in Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS and shall have a California Bearing Ratio (CBR) of at least 50. Aggregates for 50 CBR subbase course shall consist of crushed quarry stone, crushed gravel (2 or more fractured faces) or a combination crushed gravel with fines

1.9.6.6 P.C. Concrete Pavement

Concrete shall have a flexural strength of 4000 psi at 28 days age. Concrete shall conform to the requirements in the Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS.

1.9.6.7 Joint Sealing

Joints in concrete pavements may be sealed with field molded sealants. Field molded joint sealants shall be specified in the Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS.

1.9.6.8 Concrete Sidewalks and Curbs and Gutters

Concrete sidewalks and curbs and gutters shall be specified in Omaha District guide specification Section 02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS. Expansion joints in concrete sidewalks shall be sealed with cold-applied sealant which is stone or grey in color.

1.10 GRADING

1.10.1 General

Positive drainage shall be provided for all areas and existing drainage ways shall be utilized to the extent possible. The use of drainage flumes is prohibited. It is desirable to direct drainage away from buildings to curb and gutter and drainage structures. Swales between buildings and parking areas shall be avoided. Parking areas shall be graded such that storm water is directed off to the sides, with curbs and gutters to control drainage, and not down the center of the parking area. Earthwork shall be balanced to the extent possible without compromising the design. The number of existing trees to be removed shall be kept to a minimum. No grading shall be done within drip lines of existing trees to be preserved. Grading shall be specified in the UFGS SECTION 2300A EARTHWORK. The Contractor shall be responsible for editing the specification for the project.

1.10.2 Borrow and Waste

Borrow materials shall be obtained from sources outside the limits of Government-controlled land. The source of borrow material shall be the Contractor's responsibility. The Contractor shall obtain from the owners the right to procure material, shall pay all royalties and other charges involved, and shall bear all the expense of developing the sources, including rights-of-way for hauling. Surplus excavated material not required for fill shall be disposed of by the Contractor at his own expense and responsibility outside the limits of Government-controlled land.

1.10.3 Sidewalks

Concrete walks shall have a transverse grade of 2 percent. Maximum desirable longitudinal walk grade shall be 4 percent and an absolute maximun grade of 8 percent. Handicapped accessible walks with a longitudinal slope greater than 5 percent shall be considered a ramp. See FED STD 795 Uniform Federal Accessibility Standards for ramp requirements. Special attention shall be given to sidewalks that are on the north (shaded) side of buildings. These walks should be designed to ensure a freeze/thaw cycle does not result in the formation of ice on the walk. Ice on walks should be a safety consideration for all areas. The use of steps in walks will be avoided whenever possible. The use of single riser steps is especially discouraged. When steps are unavoidable, they should have at least three risers and will be provided with handrails. Double purpose walks are a combination of a straight curb and a concrete walk. Their use shall be limited to area where the drainage flows away from the curb line or gutter.

1.10.4 Transverse Parking Area Grades

a. Desirable minimum of 2 percent.

b. Absolute minimum of 1.5 percent for flexible pavement and 1 percent for rigid pavement.

1.10.5 Longitudinal Parking Area Grades

Maximum of 4 percent.

1.10.6 Ramp Grades

a. Desirable maximum of 7 percent.

b. Absolute maximum of 10 percent for short distances only.

1.10.7 Gutter Grades

a. Desirable minimum of 0.8 percent.

b. Absolute minimum of 0.5 percent.

1.10.8 Building Floor Elevation

Building finished floor elevation shall be set to ensure that the required minimum and maximum grades are met.

1.10.9 Grades Away From Building

a. Minimum of 5 percent for 10'.

b. Maximum of 10 percent for 10'.

1.10.10 Overlot Grades

a. Minimum 1 percent for cohesionless sandy soils.

b. Minimum 2 percent for cohesive soils or turfed areas.

c. Sideslopes for ditches, roads, and other turfed areas shall be no steeper than 1V on 3H.

1.10.11 Adjustment of Existing Structures

All manholes, valve boxes, hand holes, or inlets of any nature within the project that do not conform to the new finish grade in either surfaced or unsurfaced areas shall be adjusted to the new finish grade. Where inlets, manholes, hand holes, or valve boxes fall within a surfaced or unpaved roadway or parking, the existing frames and cover shall be removed and replaced with a heavy-duty frame and cover. The structure shall be adjusted as needed to fit the new conditions.

1.11 ROAD GEOMETRIC DESIGN

Horizontal and vertical alignment shall be designed in accordance with AASHTO "A Policy on Geometric Design of Highways and Streets".

1.12 STORM DRAINAGE

1.12.1 Determination of Storm Runoff

For areas of up to about 1 square mile, where only peak discharges are required for design and extensive ponding is not involved; the computation of runoff will be accomplished by either the Rational Method or the modified rational method presented in TM 5-820-1. For larger areas, when suitable unit-hydrograph data are available or where detailed consideration of ponding is required, computation should be by unit-hydrograph and flow-routing procedures. If the method presented in TM 5-820-4 is used to determine the peak discharge, the minimum time of concentration for turfed or paved areas shall be 5 minutes.

1.12.1.1 Design Storm Return Period

Storm drains and culverts shall be sized for a design storm with a return period of 10 years. Provisions shall be made to protect all buildings and critical structures from a major storm with a return period of 100 years.

1.12.1.2 Rainfall Depth-Duration-Frequency Data

Rainfall data for states in the western United States shall be obtained from NOAA ATLAS 2. Rainfall intensity-duration data developed by cities or regions may be used if available. Rainfall Intensity-Duration data for projects at Fort Carson shall be obtained from the City of Colorado Springs/El Paso County Drainage Criteria Manual.

1.12.2 Storm Drainage System Layout

The Contractor shall be responsible for design of the storm drainage

system. An underground storm drainage systems shall be provided. The storm drainage system shall be specified in UFGS Section 02630A STORM-DRAINAGE SYSTEM. Submittal of pipe samples shall not be required. The Contractor shall use the Corps of Engineers standard details for storm drain manholes, area inlets and curb inlets. The standard details are available at the Corps FTP site. The storm drainage system shall be designed so as to minimize the number of drainage structures required. The Contractor shall determine the connection points into the existing storm drain system. The storm drainage system shall be properly coordinated with surrounding properties to ensure runoff does not cause damage to the other properties. Structures shall be located at all changes in direction of storm drain line, at the intersection of two or more storm drain lines, and where required to intercept rainfall runoff. The distance between drainage structures will be not more than approximately 300' for conduits with a minimum dimension smaller than 3 inches. Where possible, a minimum drop of 2 inches between inverts of equal diameter storm drain pipes shall be provided at the centerline of drainage structures. Where storm drain pipes are of different diameters, the pipe crown elevations should be matched at the drainage structure. Storm drain systems shall be designed to provide a minimum flow velocity of 2.5 feet per second when the drains are one-third or more full. Storm drain pipes shall have a minimum diameter of 12 inches. Storm drain lines shall be located outside of paved areas to the extent possible. Under no circumstances shall storm drain lines be located beneath buildings.

1.12.2.1 Manholes

Diameter of manholes shall be large enough to accommodate pipes entering and exiting the manhole.

1.12.2.2 Area Inlets

Area inlets shall be properly sized and designed to accommodate the design flows.

1.12.2.3 Curb Inlets

Locating parking area curb inlets at building entrances shall be avoided if possible. Curb inlets along two-lane streets shall be spaced and sized so that the flow in the gutter and ponded areas at low points do not cover the crown of the street.

1.12.2.4 Headwalls and Flared End Sections

Headwalls or flared end sections shall be provided at the entrance and outlet ends of culverts and at storm drain outfalls. Outlets and endwalls shall be protected from undermining, scour, lateral erosion and degradation of the downstream channel by use of appropriately designed/sized rip-rap.

1.12.2.5 Culverts

Culvert pipes shall have a minimum diameter of 18 inches wherever possible.

1.12.3 Roof Drain Outfall Lines

Downspouts and roof drains shall be connected to underground storm drains. Roof drain outfall lines beyond 5 feet from the building shall be of the same materials as the exterior storm drainage system. Minimum diameters shall be 12 inches for lengths over 50 feet and 8 inches for lengths under

50 feet. In addition, the diameter shall be at least 2 inches larger than the diameter of the line as it leaves the building. All changes in direction of outfall lines shall occur at storm drain structures except that cleanouts may be used in lines smaller than 12 inches.

1.12.4 NOT USED

1.12.5 Storm Drain and Culvert Pipe

The Contractor shall select the appropriate storm drain and culvert pipe materials from the options specified in UFGS Section 02630A STORM-DRAINAGE SYSTEM. Pipe, bedding, and backfill shall be of adequate strength (or stiffness) to support the earth, live, and construction loads imposed on the pipe. Only pipe materials which have a minimum design service life of 50 years shall be allowed for permanent installations. As a minimum, all pipe joints shall be soiltight. The Contractor shall specify watertight joints when the water table is at or above the pipeline.

1.12.5.1 Concrete Pipe

Reinforced concrete pipe shall be a minimum Class III. Concrete pipe shall not be used where soil is more acidic than pH 5.5 or when the fluid carried has a pH less than 5.5 or higher than 9.0. Type I cement may be used only when sulfates in the soil are 0.1 percent or less and dissolved sulfates in the effluent are 150 ppm or less. Type II cement may be used only when sulfates in the soil are 0.2 percent or less and dissolved sulfates in the effluent are 1,500 ppm or less. Only Type V cement may be used if sulfates in the soil exceed 0.2 percent or dissolved sulfates in the effluent exceed 1,500 ppm. Concrete culverts and storm drains shall be protected by a minimum of 3 feet of cover during construction to prevent damage before permitting heavy construction equipment to pass over them during construction.

1.12.5.2 Plastic Pipe

Stiffness of the plastic pipe and soil envelope shall be such that the predicted long-term deflection shall not exceed 7.5 percent. Plastic culverts and storm drains shall be protected by a minimum of 3 feet of cover during construction to prevent damage before permitting heavy construction equipment to pass over them during construction. Split couplers shall not be allowed for corrugated high-density polyethylene pipe.

1.13 Not Used

1.14 TRAFFIC SIGNAGE AND STRIPING

Traffic signage and striping shall be provided for all new roads and parking areas. Signage and striping shall be designed in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways. Number and location for these signs are shown on the drawings. Parking areas shall be striped with non-reflectorized paint. Roads and streets shall be striped with reflectorized paint. Traffic signs shall be specified in the Omaha District guide specification Section 02440 TRAFFIC SIGNS. An unedited version of Section 02440 has been included as an

attachment for information only. The Contractor shall be responsible for editing the specification for the project. See end of the RFP, Attachment No. 3B. Pavement markings shall be specified in UFGS Section 02763 PAVEMENT MARKINGS. All new striping shall be lead free.

1.15 EROSION AND SEDIMENT CONTROL

The Contractor shall be responsible for selecting and implementing Best Management Practices (BMPs) to minimize pollutants in storm water discharges associated with construction activity at the construction site. All erosion and sediment measures and other protective measures shall be maintained by the Contractor in effective operating condition. All temporary structural practices shall be removed once the corresponding disturbed drainage area has been permanently stabilized. In the State of Colorado, EPA has authority for the National Pollutant Discharge Elimination System (NPDES) on Federal Facilities. If construction activities results in the disturbance of 1 acre of land or more, coverage under the EPA Storm Water General Permit For Construction Activities (Colorado Permit No. COR10*##F) is required. The Contractor and the Omaha District Corps of Engineers shall be co-permittees. The Contractor shall be responsible for complying with the requirements in UFGS Section 01355 ENVIRONMENTAL PROTECTION and with the requirements of Omaha District guide specifications Section 01565 (FEDERAL FACILITIES COLORADO) NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES. The Contractor shall be responsible for editing and applying the requirements of Omaha District guide specifications Section 01356 STORM WATER POLLUTION PREVENTION MEASURES. An unedited guide specification Section 01356 have been included as attachment. See end of the RFP, Attachment No. 3B. Guide specification Section 01565 has been included as attachment. See end of the RFP, Attachment No. 3B. If coverage under the NPDES Permit is not required, Specification Section 01565 shall not be applicable.

1.15.1 Temporary Construction Entrance

Tracking of mud from the construction site onto adjacent roads and streets shall be kept to a minimum. A temporary stabilized stone pad shall be constructed at points where vehicular traffic will be leaving the construction site and moving directly onto a paved road or street. It shall extend the full width of the vehicular ingress and egress area and have a minimum length of 75 feet. The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto adjacent roads or streets. If conditions on the site are such that the majority of the mud is not removed by the vehicles traveling over the stone, the the tires of the vehicles shall be washed before entering the road or street. Any mud which is tracked onto roads or streets shall be removed at least once daily.

1.15.2 Erosion Control Blanket

Bottoms and sideslopes of ditches and any other disturbed slopes 1V on 3H or steeper shall be covered with an erosion control blanket immediately after seeding.

1.15.3 Silt Fence

Silt fencing shall be installed below disturbed areas where erosion would occur in the form of sheet and rill erosion. The size of the drainage area above the silt fence shall not exceed one fourth of an acre per 100 feet of silt fence length. Silt fencing may be installed across ditches only when the maximum contributing drainage area is not greater than 1 acre. Silt

fence constructed across a ditch shall have wire support and shall be of sufficient length to eliminate endflow.

1.15.4 Straw Bale Barrier

Straw bale barriers may not be installed across ditches.

1.15.5 Storm Drain Inlet Protection

Storm drain inlet protection shall be installed around any new or existing storm drain inlets that will become operational before permanent stabilization of the corresponding disturbed drainage area has occurred. Storm drain inlet protection shall include either a sediment filter or an excavated area around the storm drain inlet.

1.15.6 Rock Check Dam

Rock check dams may be installed in ditches which drain 2 to 10 acres. The allowable drainage area will be dependent on the gradation of the rock used to construct the check dam. The maximum height of the dam shall be 1.0 meter. The center of the dam shall be at least 6-inches lower than the outer edges. For added stability, the base of the check dam may be keyed into the soil approximately 6-inches. The maximum spacing between the dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.

1.15.7 Temporary Sediment Trap

Temporary sediment traps may be constructed below disturbed areas where the total drainage area is less than 3 acres.

1.15.8 Temporary Sediment Basin

Temporary sediment basins may be constructed below disturbed areas where the total drainage area is equal to or greater than 3 acres.

1.15.9 Other Controls

Other controls such as diversion dikes, level spreaders, temporary seeding, etc. may be used if deemed necessary by the Contractor.

1.16 COMPOSITE UTILITIES

The Contractor shall not run utilities underneath buildings. The Contractor shall avoid running utilities underneath streets and parking lots where practicable. In cases where it is necessary for the utilities to cross existing streets, the Contractor shall install the lines by trenchless excavation methods. No open trenching will be allowed through existing streets, unless written permission is obtained and approved by Fort Carson.

1.16.1 CATHODIC PROTECTION

Corrosion protection shall be provided for all buried gray or ductile-iron piping, fittings, valves, and other water line appurtenances, regardless of pipe material. Corrosion protection shall consist of an anode type cathodic protection system. See SECTION 01007 Electrical Requirements.

1.16.2 WATERLINES

Waterlines shall be designed and constructed in accordance with the combination of the State of Colorado Department of Public Health and Environment's "*Design Criteria for Potable Water Systems (Revised March 31, 1997)*" and the Corps of Engineers Guide Specifications, Technical Manuals (TM), Engineering Manuals (EM), Military Handbooks (MH), and the industry standards listed herein. In the event of conflict, the Contractor shall follow the State requirements/criteria which govern the waterlines. The Contractor shall refer to the Corps of Engineers standard details for waterline details. The standard details are available at the Corps FTP site under "Environmental" directory.

a. In addition to the State of Colorado criteria listed above, water distribution systems and water service lines shall be designed and constructed in accordance with TM 5-813-5, and the UFGS Section 02510 WATER DISTRIBUTION SYSTEM. The Contractor shall be responsible for protection of existing waterlines. If any potable waterlines are damaged during construction, the Contractor shall immediately notify the Contracting Officer. The Contractor shall disinfect all new water lines and any remaining lines which do not remain fully pressurized during construction or connection. The Contractor shall notify the Contracting Officer prior to disinfection of the water lines. The disinfection shall be in accordance with the American Water Works Association Standard AWWA C651, and shall not be considered complete until two consecutive days of bacteriological samples show no contamination. The Contractor shall perform the bacteriological, lead, and copper analyses at the Contractor's expense. All bacteriological, lead and copper tests shall be performed by Environmental Protection Agency (EPA)- certified laboratories. Copies of results of the analyses shall be forwarded to the Contracting Officer upon receipt.

b. The Contractor shall design and provide all facilities required to deliver water to the project. Service connections or extensions to the existing water distribution system shall be made without interruption to service. The domestic demand for the new facility served shall be designed in accordance with the "fixture count method" specified by the most current National Standard Plumbing Code. For design of the waterlines, use maximum Hazen-Williams "C" value of 130 for plastic pipe and 120 for other pipe materials.

1.16.2.1 Domestic Water Service Lines

- Flow Requirements

a. Water shall be supplied by service lines of appropriate capacity to provide the flows determined to be necessary to meet all requirements of the new facility. The requirements include all domestic use and lawn sprinkler/irrigation systems.

b. The Contractor shall perform fire hydrant flow tests to determine pressures (static and residual pressures) and flow rates and confirm the adequacy of the existing water line that is chosen. The Contractor shall also confirm hydrant flow test data with the Omaha District Corps of Engineers. Values obtained from the Corps of Engineers shall be used to design all new water lines so minimal head loss is achieved and maximum

residual pressure and flow are obtained. The contractor shall submit all design calculations and pressure analyses for approval with the design package.

- Service Connections

A maximum velocity of 10 feet per second shall be used for metallic piping and 5 feet per second shall be used for nonmetallic piping. A minimum pressure of 30 PSI at ground elevation is required under peak domestic flow conditions. Service connections shall be made via corporation stops, appropriate gooseneck connections, or tapping sleeves and valves. The number and maximum size of corporations stops shall be as specified in the UFGS Section 02510 WATER DISTRIBUTION SYSTEM.

- Dewatering, Hydrostatic Testing, and Flushing of Lines

The Contractor shall be responsible for implementing the terms and requirements of UFGS Section 13550 ENVIRONMENT PROTECTION for dewatering, hydrostatic testing, and flushing of lines after disinfection.

- Domestic Service Stop Valve

Building shall be provided with separate service and stop valves in areas readily accessible to maintenance and emergency personnel. Stop valves located in walks are prohibited.

1.16.2.2 Fire Protection Water Service Lines

Water shall be supplied by service lines of appropriate capacity to provide the flows determined to be necessary to meet all requirements of the interior and exterior fire protection. For the design and installation of the fire protection water service lines, the Contractor shall utilize the Military Handbook (MIL-HDBK-1008C) as necessary. In the event of a conflict between this handbook and any other document(s), the subject military handbook shall take precedence over all others.

- Fire Flow Data

For determination and documentation of fire protection, the Contractor shall conduct and provide all fire hydrant flow tests. Data to be included with the flow tests are static pressures, residual pressures, flowrates, date and time tests were conducted, and name of personnel conducting the fire hydrant flow tests. The static pressures, residual pressures, flowrates, test hydrant and flow hydrants shall be shown on the appropriate contract drawings. Fire hydrant flow tests required for fire protection design shall be made in accordance with the procedures specified in NFPA 291.The Contractor shall coordinate with the Fort Carson Fire Department and Civil Engineering Office prior to conducting such tests. The Contractor shall submit the fire hydrant flow test data with the design calculations to the Contracting Officer for approval. The Contractor shall confirm hydrant flow test data with the Omaha District Corps of Engineers, Environmental Design Section.

- Fire Hydrants

If removal and/or replacement of any existing fire hydrant(s) warranted, hydrant(s) shall be removed with the shut-off valve closed and capped. The Contractor shall be required to install fire hydrants for the new facility, if necessary. One fire hydrant shall be located within a minimum of 150 feet of the building fire department connection. All other hydrants shall be located in accordance with Military Handbook MH 1008C, as necessary. Fire hydrant styles shall meet the requirements of Fort Carson.

- Dedicated Fire Protection Water Service Line

The Contractor shall be required to provide a separate fire protection water service line to the building for interior fire sprinkler protection in accordance with NFPA 24 and Military Handbook MH 1008C. The fire protection water service line to the building shall be equipped with a Post Indicator Valve (PIV) that can be readily located by the fire department. The PIV shall not be placed closer than 40 feet to the building it is serving and shall be provided with a tamper switch connected to the building fire control panel. The PIV shall be set so the top of the Post will be 36 inches above the finished grade. The PIV shall be protected by 6-inch steel pipe bollards, filled with concrete, painted and spaced in accordance with the Fort Carson requirements.

1.16.2.3 Irrigation Sprinkler System

See paragraph: Irrigation Sprinkler System for irrigation system requirements.

1.16.3 WASTEWATER

Wastewater lines shall be designed and constructed in accordance with the combination of the State of Colorado, Dept. of Public Health and Environment, "*Design Criteria Considered in Review of Wastewater Treatment Facilities, Policy 96-1*" and the Corps of Engineers Guide Specifications, Technical Manuals (TM), Engineering Manuals (EM), Military Handbooks (MH), and the industry standards listed herein. In the event of conflict, the Contractor shall follow the State requirements/criteria which govern the wastewater lines. The Contractor shall refer to the Corps of Engineers standard details for sewer line details. The standard details are available at the Corps FTP site under "Environmental" directory.

1.16.3.1 Design Criteria

In addition to the State criteria listed above, the sewage system shall be designed in accordance with TM 5-814-1, TM 5-814-2, and UFGS Section 02531 SANITARY SEWER. No interruption of service shall be allowed on the existing sanitary sewer line. The Contractor shall coordinate with the Contracting Officer the sequencing of construction as it affects the existing sanitary sewer line. Exterior building sanitary sewer service lines shall be 6 inches minimum diameter. All design slopes will be calculated using the Manning formula.

1.16.3.2 Manholes

Manholes are required at all changes of direction, slope, and size. Manholes shall be spaced not more than 300 feet apart. Manholes shall be located at intersections of streets when possible. Avoid placing manholes where the tops will be submerged or subject to surface water inflow. Where the invert of the inlet pipe would be more than 18 inches above the manhole

floor, a drop connection shall be provided. The Contractor shall provide all calculations.

1.16.3.3 Sewer Mains

The peak diurnal and extreme peak flowrates shall be calculated according to TM 5-814-1. Curved sewers are prohibited. Pipes shall be designed to provide a minimum velocity of 2 feet per second at the average hourly flowrate, and a minimum velocity of 2.5 to 3.5 feet per second at the peak diurnal flowrate. Maximum velocity shall be 10 feet per second.

1.16.3.4 Sanitary Sewer and Waste Drain Connections

There are two existing sanitary sewer lines around the new building. All floor and trench drains in the apparatus room and vehicle bays shall be connected to a new waste drain line which shall be connected to one of the existing sanitary sewer lines.The new waste drain line shall have a valve to be closed off to contain any accidental spills (i.e., oil or fuel spills, AFFF spills from the fire-fighting agent storage vehicle (foam trailer) parked in the apparatus room. Trench drains from the bays or outside wash areas will discharge to the sanitary sewer. The contractor shall contact DECAM to determine if an oil/water separator is necessary. Oil/water separator shall be design in accordance with API guidelines. The exterior wash area drain line shall have a diversion valve to discharge the wash water to the sanitary sewer or direct runoff to the storm drainage.

1.16.4 Gas Distribution System

See SECTION 01006 MECHANICAL REQUIREMENTS for instructions and engineering information relating to the design of the exterior gas distribution system.

1.17 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

1.17.1 Trenches

Sewer and water lines, mains or laterals, shall be placed in separate trenches. The separate trenches shall maintain a minimum horizontal separation of 9'-10" and the bottom of the water line shall be at least 1'-6" above the top of the sewer. Sewers crossing above potable water lines shall maintain a vertical separation of 1'-6" and must be constructed of suitable pressure pipe or fully encased in concrete for a distance of 9'-10" on each side of the crossing. A trenchless excavation method shall be required when an underground utility line crosses any roadway.

The trench shall be excavated as recommended by the manufacturer of the pipe to be installed. Bedding and initial backfill material shall be in accordance with the manufacturer's recommendations. Where no manufacturer's installation manual is available, trench walls shall be excavated to a stable angle of repose as required to properly complete the work. Trench excavations shall adhere to requirements prescribed in EM 385-1-1 SAFETY AND HEALTH REQUIREMENTS manual. Special attention shall be given to slopes which may be adversely affected by weather or moisture content. Excavation, trenching, and backfilling shall be performed in accordance with the UFGS Section 02316 EXCAVATION, TRENCHING AND BACKFILLING FOR UTILITIES SYSTEMS. Groundwater is not expected to be encountered during the excavation of utility trenches, however, the Contractor shall coordinate and confirm with the Contracting Officer the depth to groundwater if the construction is

done during the wet season.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

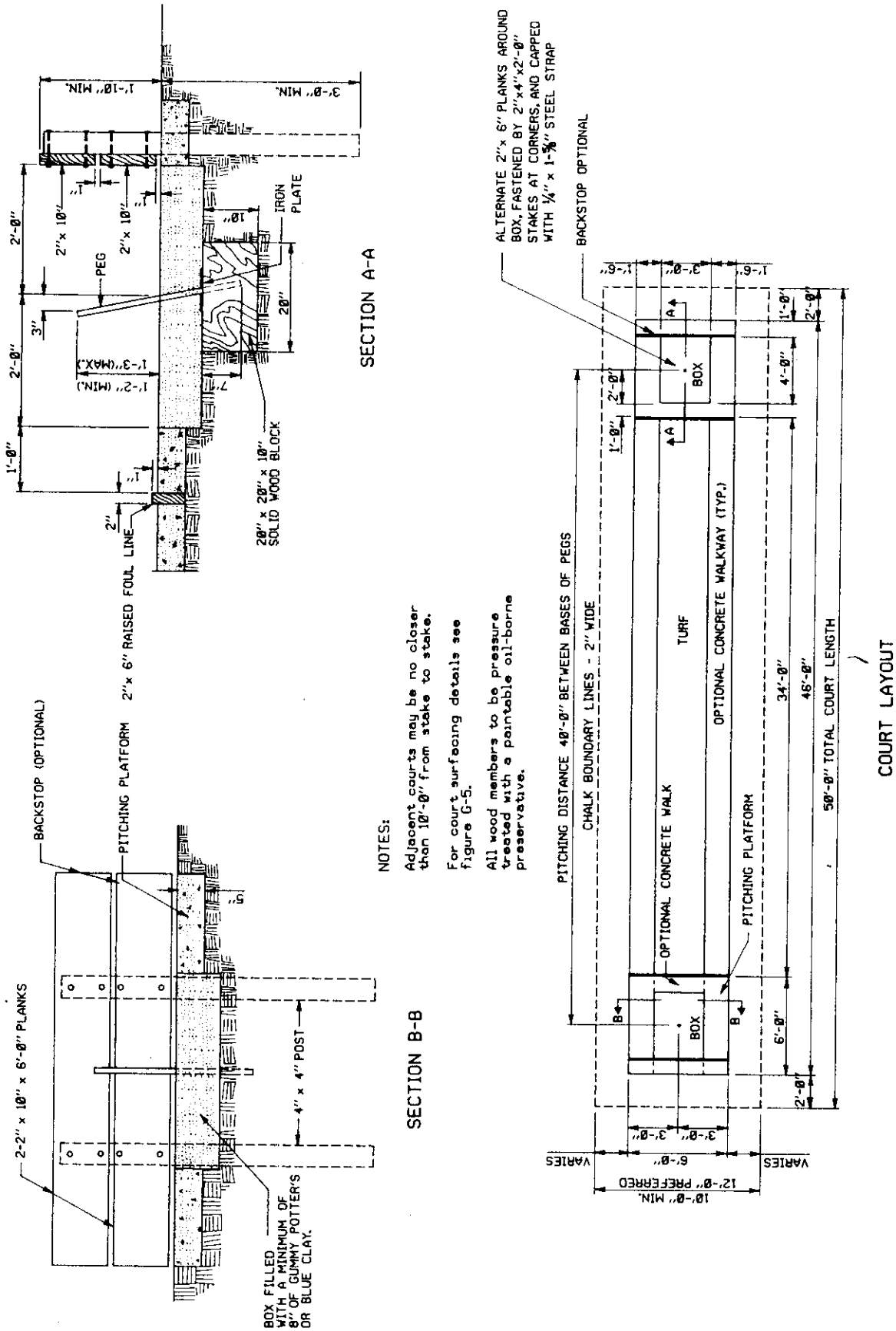
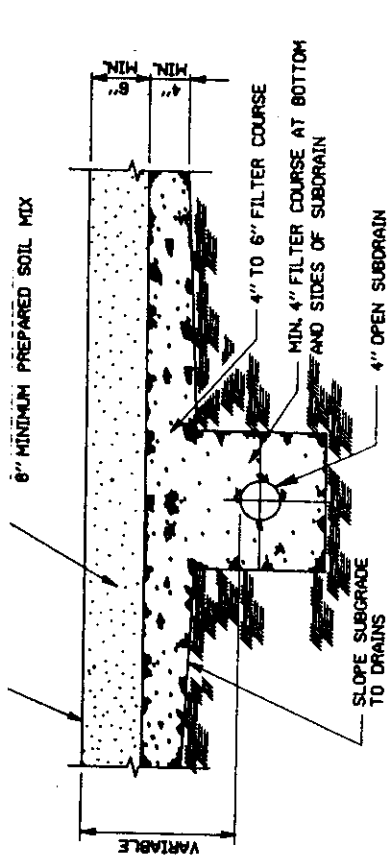
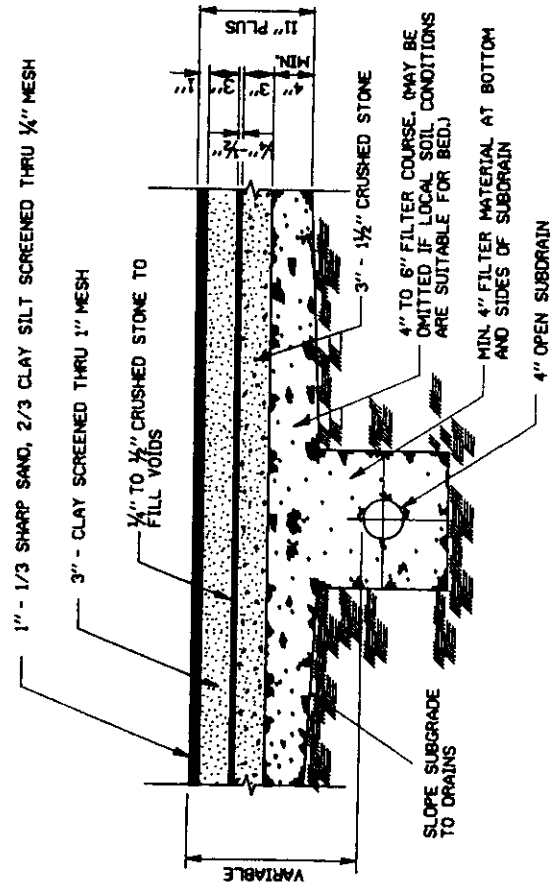


Figure A-11. Horseshoes.



TYPICAL SECTION - NATURAL TURF



TYPICAL SECTION - SAND CLAY

NOTES:

Install all underground utilities before constructing playing surfaces or walks.

Figure G-5. Typical playing surface.

Suggested plant species for the new fire station.

Extremely Drought Tolerant	Planting Aspect
Evergreen Trees	
Pinyon Pine	South/West
Ponderosa Pine	South/West
Rocky Mountain Juniper	South/West
Evergreen Shrubs	
Common Mountain Juniper (Spreader)	South/West
Kinnikinnik	North/East
Deciduous Trees	
Bur Oak	South/West
Golden Rain tree	North/East
Common Hackberry	South/West
Rocky Mountain Maple	North/East
Large Deciduous Shrubs	
Native Chokecherry	East/West/South
Canada Chokecherry	East/West/South
Nanking Cherry	East/West/South
Cotoneaster	East/West/South
Mountain Mahogany	East/West/South

Large Deciduous Shrubs (cont.)

Rabbit Bush	West/South
Native Fender Rose	West/South
Sumac Three leaf (6'/5')	West/South
Sumac Staghorn(20'/12')	West/South

Dwarf Deciduous

Sand Cherry	West/South
Coralberry	East/West/South
Creeping Colorado (Grape Holly)	East/West/South

Hardy, some irrigation may be required.

Evergreen trees

Colorado Blue Spruce	North/East

Deciduous Trees

Russian Hawthorn	North/East
Autumn Blaze Maple	North/East
Thornless Honeylocust	East
Narrow Leaf Cottonwood	North/East
Regal Elm	North/East

Deciduous Shrubs

Barberry	East
Potentilla	East
Peashrub	East

Perennials

Sedum: Stonecrop	East
Russian Sage	South/West
Lavender Cotton	South/West
Lily of the Valley	North/East
Thyme	East
Spanish Iris	East/South
Ice Plant	South/West

Ornamental Grass

Blue Fescue	South/East
Blue Oak Grass	South/East

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SECTION 01003

ARCHITECTURAL BUILDING REQUIREMENTS

PART 1 ARCHITECTURAL BUILDING REQUIREMENTS

1.1 FUNCTIONAL PLAN REQUIREMENTS

The facility design is based upon English measuring units. All dimensions shown on Architectural sheets are indicated in feet and inch units. The overall design and configuration can be slightly altered as long as each individual room area is not reduced and the overall building area is not changed. The areas shown on the drawings for the individual rooms is the minimum area to be provided for that room. Design alterations will be allowed as required for material modular sizing considerations, economy of detail connections, access for utilities and handicap provisions.

It is important that the functional integrity of the floor plan be maintained and any changes that the Contractor proposes to the RFP documents shall be submitted to the government for approval.

The architectural component of the project is a 17,314 square feet single story facility with a mezzanine. The final facility design and exterior features of the facility will reflect the furnished drawings and technical requirements outlined in the RFPand shall conform to the Installation design Guide. The contractor shall update all room names and numbers on all drawings and schedules as appropriate.

This facility will include the following Common Support, Administrative, and Operations areas:
Common Support areas include vestibules, waiting area, break room, conference room, storage, electrical/UPS rooms, communications rooms, mechanical rooms, generator room, corridors, janitor closet, stairs, and mezzanine. Administrative areas include secretary/receptionist, 911 supervisor and dispatch center offices, 911 communications room, 911 toilet, chief fire inspector, fire inspector's suite, fire chief's office, shift leaders office, and fire chief/shift leader dorm room and toilet. Operations areas include apparatus bays, pressure washing equipment rooms, breathing apparatus recharging room, fire gear cleaning room, disinfection/EMS/decontamination room, wet and dry chemical fire extinguisher room, and storage rooms. Operations area support spaces for personnel include dorm rooms, toilets and lockers, physical training facilities, kitchen, dining room, refrigerator/freezer room, pantry, library/crew meeting room, recreation area, day room, laundry room, captains offices and dorms, library/crew meeting room.

The layout of the mechanical, electrical and communication spaces are suggestive and may require wall configurations to be slightly altered to conform with equipment requirements. It shall be the responsibility of the contractor to verify that there is adequate space in rooms, chases, and above ceilings for all mechanical, electrical, and communication equipment and that coordination for this equipment installation and function occurs.

All attempts shall be made to locate columns within walls except in the Apparatus Bays. The Apparatus Bays shall be clear span and columns shall not be permitted between bays, but only at the permitter walls. Structural elements such as rigid frames that affect the function and impede on the usable space and volume of a room shall not be permitted. Column locations shall be approved by the Government. In-wall columns shall be concealed where ever possible. In-wall columns and pilaster protrusions (including finishes) shall be limited to 6-inches. These column locations however, shall be coordinated fully with equipment, specialties, and furniture systems furniture layouts so as not to impact the function of such items.

Fire separation walls and egress from the facility shall meet or exceed the requirements of NFPA 101 - Life Safety Code, and Military Handbook 01008C - Fire Protection for Facilities. The Military Handbook 01008C shall have precedence over all other fire codes. This facility will be completely fire sprinklered as part of the requirement. The facility shall have a complete fire code analysis by a fire protection engineer to determine the location of all fire rated walls, ceilings, and doors.

Provisions in the design and construction of the facility shall be made to accommodate building movement and expansion both during construction and after the facility is completed and occupied. With large floor and roof areas as for this project, structural steel and roof framing shall accommodate differential movement from expansion and contraction due to temperature differentials that will seasonally occur and throughout the day, without damage to adjacent areas, and connections to structural and other elements.

1.2 DESIGN CRITERIA

The technical specifications provided shall serve as the minimum design standards established for this project. Design publications listed in each specification section shall be used as sources of criteria for design. The criteria from these sources may be supplemented, but not supplanted, by applicable criteria contained in nationally recognized codes, standards, and specifications. The floor plan shall meet the needs of the building users, and as such no function shall be changed or removed from the design without approval of the building users.

References in the following 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 not be construed as limiting competition.

1.2.1 TECHNICAL SPECIFICATIONS

The government-provided technical guide specifications shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product and installation requirements for this facility.

The provided specifications define the minimum requirements and level of quality for items of equipment, materials, installation, and testing that shall be provided for the facility. Where items of equipment, materials, installation, or testing requirements are not covered in the provided specifications; special sections, paragraphs, or within each guide specification or new specifications sections shall be prepared to cover those subjects.

1.2.2 PUBLICATIONS

The design publications listed below shall be used as sources of criteria for the architectural design. The most current edition of the code or standard shall be used as criteria for the design. The criteria from these sources may be supplemented but not supplanted, by applicable criteria contained in nationally recognized codes, and standards.

1.2.2.1 National Fire Protection Association

Life Safety Code #101, most current edition (See SECTION 01008 - Fire Protection Requirements)

Installation, Maintenance, and Use of Fire Service Communications Systems # 1221, 2002 Edition

1.2.2.2 International Conference of Building Officials

International Building Code (2000 Edition)

1.2.2.3 Military Handbooks

MIL HDBK 1190 - Facility Planing and Design Guide, Dated 1 September 1987

Military Handbook 1008C Fire Protection for Facilities (1997)(This publication takes precedence over all others)

1.2.2.4 American with Disabilities Act (ADA)

Accessibility Guidelines for Buildings and Facilities (July 1, 1994)

Uniform Federal Accessibility Standards (UFAS) (Latest Edition)

1.2.2.5 Design Charrette Documentation

FY-03 Congressional Add, P.N. 12365 Main Fire Station, Fort Carson, Colorado

1.2.2.6 Occupational Safety and Health (O.S.H.A.) Standards

1.2.2.7 Installation Design Guide for Fort Carson, CO.

1.2.2.8 Unified Facilities Criteria (UFC)

UFC-4-010-01, Draft, 12 July 2002, DOD Minimum Antiterrorism Standards for Buildings

1.3 DESIRED IMAGE AND ARCHITECTURAL COMPATIBILITY

The Proposer shall verify all existing conditions and dimensions during design and prior to construction.

The building shall fit the site and be compatible with the surrounding environment. Building facades and elevations shall match the appearance to the enclosed elevation drawings. Slight alterations will be allowed as

required for material modular sizing as approved by the Corps of Engineers.

1.4 THE TYPE OF ACTIVITIES AND EQUIPMENT INVOLVED

The major functional activities of building are as follows:

Common Support, Administrative, and Operations areas:

The Common Support and public area is defined by the tower element and includes the main entry, vestibules, waiting area, break room with kitchenette and vending, display case, conference room with provisions for a training classroom and testing, storage, electrical/UPS rooms, communications rooms, mechanical rooms, generator room, corridors, janitor closet, stairs, mezzanine, and hazardous materials outbuilding.

Administrative areas includes a wide variety of spaces necessary for the operation of the facility. Spaces include secretary receptionist, 911 supervisor and dispatch center offices, 911 communications room, 911 toilet, chief fire inspector, fire inspector's open office suite, fire chief office, shift leaders office, fire chief/shift leader dorm room and toilet, administrative support (copier) area, and public toilets.

Operations areas include the apparatus bays which is a high roofed area. Vehicles parked in the apparatus bays are critical to the overall mission and operations but are not in continuous operation. The vehicle apparatus bays shall be used for storage of vehicles and could involve daily minor types of repair and inspections, but will not include labor intensive types of vehicle repairs. Also included are the pressure washing equipment rooms, breathing apparatus recharging room, fire gear cleaning room, disinfection/EMS/decontamination room, wet fire extinguisher room, storage rooms, and dry chemical extinguisher rooms.

Operations area support spaces for personnel include dorm rooms, toilets and lockers, captains offices and dorms, physical training facilities, kitchen, dining room, refrigerator/freezer room, pantry, library/crew meeting room, recreation area, day room, televisions room, laundry room, crew meeting room, and library. An exterior vehicle wash rack will be provided at the rear of the facility.

Additional description of the individual spaces within these three major groups are further defined within this Section.

1.5 TYPE AND METHOD OF CONSTRUCTION

1.5.1 Facility Construction

The facility shall be designed as permanent construction. The definition of permanent construction per MIL HDBK 1190: Buildings and facilities designed and constructed to serve a life expectancy of more than 25 years, shall be energy efficient, and must have finishes, materials, and systems selected for low maintenance and low life-cycle cost.

Types and methods of construction limited to the criteria established herein and shall meet all governing codes.

Wood construction shall not be permitted.

All concrete masonry units and/or concrete walls used in this buildings shall be developed on a standard masonry module. Standardization of masonry wall design shall be developed which result in as few cut blocks as possible. Masonry structural properties shall comply with requirements outlined in Section 01005 STRUCTURAL REQUIREMENTS.

Walls, windows, floors,and roofing systems shall be permanently constructed and attached to each other. All construction shall be done in a workman like manner, properly installed in accordance with manufacturer's recommendations and finished.

Construction andmethods, materials, systems, etc. shall be of a quality that requires little or no maintenance. The Contractor shall not change exterior material selection and colors
indicated. Materials have been selected to be durable, low maintenance and economical and reflect the level of quality required for this facility and area of the Post.

1.5.2 Exterior Walls and Finish Materials

Exterior walls and finish materials shall be selected on the basis of architectural compatibility and appearance in accordance with the design provided. The outside face of the exterior walls shall be composed of face brick, concrete masonry units (Split face, 1/2 scored, or burnished)and cast stone trim and banding (as indicated on the drawings). A unique color, style and/or shape of concrete masonry units or face brick shall be provided at the main entrance segment of the building as shown on the drawings. Walls shall be a system that is comprised of a masonry cavity wall. This masonry cavity wall system consists of 4-inch face brick or concrete masonry units on the exterior, a minimum 1-inch air space, 2-inch minimum cavity wall insulation meeting the specified, and a minimum 8-inch concrete masonry unit interior wythe. This will provide a durable interior surface for the abuse that may occur in an apparatus bay/shop environment. Other exterior walls where shop environments do not occur consist of a masonry cavity walls as described above with with a gypsum wallboard interior finish. An optional masonry veneer system for the non apparatus bay portions of the building may be considered and will consist of non-load bearing 4-inch nominal face brick or split face concrete masonry units, a 2-inch air space, an air barrier, 1-inch insulating sheathing to minimize thermal bridging, 3/4-inch structural sheathing (cementitious type board instead of gypsum board, 4-inch steel studs, fiberglass insulation, vapor retarder membrane, and a 5/8-inch interior layer of gypsum wallboard. All opaque portions of exterior walls shall have a minimum R-value of 15, based on aged insulation values for the entire exterior wall assembly. All walls shall require a minimum of 2-inches of rigid perimeter insulation on the inside of foundation walls extending down to below the frost line. All areas where thermal bridging can occur shall be insulated to meet the R-value requirements and the insulation and vapor retarder membranes shall be continuous. Exterior storefront and curtain wall systems for the building shall be thermally broken and improved, exterior glazed pressure plate systems with concealed fasteners. The framing shall be specially designed to have a 1-inch bite on the glass. The finish on the exterior storefront and curtain wall systems is anodized. The 1-inch insulating glass shall be tinted light to medium gray. Exterior walls shall have a minimum "U" Value of .07 based on aged insulation values for the entire exterior wall construction.

1.5.3 Interior Wall Construction

All interior walls shall be permanent construction. Demountable partitions shall not be considered acceptable.

Gypsum wallboard shall not be less than 5/8-inch thick and shall be type "X" fire rated where required.

Steel studs shall be sized and gaged according to the wall heights required. Manufacturers recommendations shall be consulted with regard to unbraced length. Steel studs to receive ceramic tile shall be as recommended by the Tile Council of America recommendations for gage and thickness.

Interior walls requiring security,fire ratings, sound ratings, and other walls extending to the underside of the roof structure shall be designed and constructed in accordance with UL and approved tested systems. These walls shall also have provisions for structural deflection of the roof structure above. Walls around the corridors, break rooms, conference rooms, all dorm and sleeping rooms, 911 dispatch center, laundry room, and physical fitness center shall contain insulation and have a minimum STC rating of 45 unless the adjacent room requires a higher level of sound separation. The partitions shall contain insulation and be sealed to the structure above and have a minimum STC rating of 45. All toilet, shower and locker room walls shall receive ceramic tile. All interior walls requiring fire ratings and smoke ratings shall be designed and constructed in accordance with UL and industry approved tested assemblies and systems. These walls shall have provisions for structural deflection of the roof structure above while maintaining the walls integrity for fire, sound, and security ratings. See Section 01005: Structural Requirements for criteria used to calculate loads and subsequent deflection control impacting interior walls. All fire and sound rated walls shall be designed and constructed as assemblies that have been tested and approved.

Partitions at mechanical shafts and elevators shall be a fire rated shaft wall system and as required by applicable codes.

Walls at mechanical rooms shall be fire rated concrete masonry units to help absorb sound and vibrations with furring and gypsum board on the side that faces corridors, offices, work areas and other people occupied spaces. Generally the partitions in the Storage Areas, Shops, and Apparatus Bay areas shall be concrete masonry units.

Glass used in interior partitions shall be 1/4-inch, clear, laminated glass and fire rated accordingly, unless otherwise indicated.

All interior walls around the perimeter of the Dispatch/911 Center including rooms 105, 106, 107, 108, and 110 shall be concrete masonry units. All walls, doors, windows and openings shall be constructed and provide security, fire protection, bullet resistance as required by NFPA 1221. Fire shutters shall be added as necessary.

The interior side of exterior walls and the interior walls of the Apparatus Bays, Janitor Closets, Storage Rooms, Alcoves, Disinfection/EMS Decontamination Room, Fire Gear Cleaning Room, and Training Room shall be of a base material and have a finish that is durable, impact resistant, is scrubbable and cleanable, and resists and does not stain or degrade when exposed to chemicals, blood, and solvents.

Corridor walls shall be full height with sound attenuation batt insulation, or some other construction that will reduce sound transmission of the wall to an STC of 45 or more.

1.5.4 Interior Wall Finishes

Interior wall finishes shall be high quality, low maintenance finishes suitable for the environment of this building.

Generally interior spaces shall receive a painted finish except as described herein and as indicated on the drawings. Color, texture, and pattern selections shall conform to the Fort Carson Installation Design Guide.

Toilet rooms, locker rooms, and janitors' closets shall receive full height ceramic tile. Showers and drying areas shall have full height ceramic tile walls. Walls receiving ceramic tile shall use Dry-Set mortar method on cement backer board on steel studs or furring in accordance with the Tile Council of America. Organic adhesive shall not be permitted.

Office areas, dorm rooms and normally occupied areas with exposed gypsum wallboard shall have a painted finish or fabric wall covering finish as indicated and coordinated with the Section 01004: INTERIOR DESIGN REQUIREMENTS portion of this RFP. The paint system shall be a high performance semi-gloss system. All interior gypsum wallboard walls to receive paint that are offices, dorms, or normally occupied except as noted otherwise shall have a light texture with one coat of primer, and two coats of high performance semi-gloss paint. Gypsum wallboard finish level shall be to a level 5 in accordance with the Gypsum Construction Handbook, 90th anniversary edition, Published by U.S. Gypsum Company and shall be approved by the Post. Oil based pints shall not be allowed.

The following areas shall have an orange peel wall texture: toilets, locker rooms, janitor, mechanical, electrical, maintenance, storage. All walls and areas to receive an orange peel wall texture shall be finished to a level 3 in accordance with the Gypsum Construction Handbook, 90th anniversary edition, Published by U.S. Gypsum Company.

All other rooms to receive a paint finish not otherwise indicated shall receive an orange peel finish wall texture. All walls to receive an orange peel texture shall have the gypsum board walls finished to a level 3 in accordance with the Gypsum Construction Handbook, 90th anniversary edition, Published by U.S. Gypsum Company.

See paint paragraph for other painting systems requirements.

All walls and areas to receive wall covering shall be finished to a level 4 in accordance with the Gypsum Construction Handbook, 90th anniversary edition, Published by U.S. Gypsum Company.

All walls above ceilings not exposed to view shall have a minimum level of gypsum wallboard finish of 1 in accordance with the Gypsum Construction Handbook, 90th Anniversary Edition, Published by U.S. gypsum Company, and as required to meet sound and fire rating requirements. All walls and partitions not extending to the underside of structure above shall extend a minimum 6-inches above the ceiling.

Walls with ceramic tile finishes on steel stud partitions shall have glass mesh mortar units, or concrete backer board as a substrate for tile. Corridors within this facility will be painted to help provide a more durable surface in these areas.

1.5.5 Floors

All interior floors shall be concrete slabs.

Depressed floor slabs and mortar bed method shall be used for all floors that will receive ceramic, quarry, and porcelain tile in accordance with Tile Council of America (TCA) methods.

The slab of the Dispatch/911 Center shall be recessed for the installation of a raised floor system. The structural floor slab shall be recessed a minimum 12-inches below the level of the finished raised floor. The raised floor system shall have 2 feet by 2 feet steel panels supported on raised pedestals with bolted stringers. See scheduled floor finishes for each room. See SECTION 01005: Structural Requirements for criteria for slabs on grade and for the design of the mezzanine floor.

A drainage trench to an oil water separator shall be provided at the apparatus bay and the exterior wash rack. Evaporative collection trench drains shall be provided at all other vehicle bays as shown. The drainage trenches shall be a minimum clearance width of 12 inches and 8 inches deep. The drainage trench shall have an aluminum or "G-90" galvanized steel open grate with removable panels and finished flush to match the surrounding floor. The grating shall be capable of supporting all vehicle loads. The purpose of the drainage trench is to catch water runoff from the vehicles. Except for the wash bay, the trench shall be self contained with no drainage to an outside source. All concrete floor slabs in the Apparatus Bays shall slope positively away from walls and doors and towards the trenches.

Depressed floor slabs shall be used to receive recessed entrance floor mats and frames at vestibules.

All exterior doors shall have structural stoops so designed and constructed so there are not any steps.

1.5.6 Floor Finishes

Flooring for this facility shall consist of the following finishes.

Concrete floors shall have a non-skid finish and shall be impervious to fuels, (including gasoline, diesel, JP-4, and JP-8). The floor surface must also be sealed to make it impervious to automotive lubricants, cleaning chemicals, and fire fighting chemicals.

Concrete floors of the Apparatus Bays shall have a light broomed finish with a light color finish.

Floors of the Laundry Room and Janitor's Closets shall be sealed concrete.

Ceramic tile and/or porcelain tileshall be installed in toilet rooms, locker rooms including showers, and shall be set in a cement mortar bed. Ceramic tile floors in toilet rooms and associated areasshall be level except in the areas around floor drains which shall be sloped to the drains

or as indicated on the drawings. Shower areas, drying areas, and other areas indicated on the drawings shall have the floor slope to allow moisture to migrate to floor drains. Control and expansion joints shall be provided in tile floors in accordance with Tile Council of America recommendations.

Vestibule areas shall receive porcelain tile (around the recessed floor mat) set in a cement mortar bed, in accordance with Tile Council of America Method #F112.

The Alcoves immediately adjacent to the Apparatus Bays shall receive a recessed floor mat.

The Kitchen shall receive a quarry tile floor set in a cement mortar bed, in accordance with Tile Council of America Method #F112.

Vinyl composition tile shall be used in the Break Room, recesses for drinking fountains, Main Entry Corridor and Corridors in the administrative portion of the facility, Dining Room, and the Corridor in the eating area..

Carpeting shall be used in the corridors of the sleeping areas, all office areas, Secretary/Reception area, dorm rooms, Day Room, Physical Training area, Library/Crew Meeting Area.

In the Dispatch/911 Center, removable carpet tiles shall be used over the raised floor system. The concrete floor slab beneath the raised floor system shall be coated with an epoxy coating.

The mechanical, electrical, communications, and all other shop and storage areas immediately adjacent to the Apparatus Bays shall have exposed concrete slabs and shall be cleaned and sealed with a concrete hardener for durability and minimization of dust.

1.5.7 Ceiling Finishes

Gypsum wallboard ceilings shall be furnished in vestibules, toilet areas,locker and showerrooms, laundry room, janitor's closets, physical fitness areas, dorm and sleeping rooms rooms, kitchen, protective clothing lockers, disinfection/EMS/decontamination room, fire gear cleaning room, apparatus bay alcoves,and shall be painted as indicated andin accordance with specification Section 09900. All gypsum wallboard ceilings shall be a minimum 5/8" thick and shall be painted with a semi-gloss enamel paint. All gypsum wallboard ceilings shall have a smooth texture. All ceiling areas shall be finished to a level 5 in accordance with the Gypsum Construction Handbook, 90th anniversary edition, Published by U.S. Gypsum Company.

The remaining areas unless otherwise indicated are generally acoustical tile ceiling panels shall be at least 3/4-inch thick mineral fiber material in a medium-duty suspension system. Acoustical tile shall be installed where indicated on the Room Material and Finish Schedule. Gypsum board and acoustical tile ceilings (gypsum board soffit borders with raised acoustical tile centers) shall be constructed for the Conference Room , Dining Room , Day Room , Library/Crew Meeting Room, and Main Entry Corridor.

It is acceptable for mechanical, generator, mezzanine,electrical, UPS, Apparatus Baysand communication equipment rooms to have exposed structures

that do not require any finished ceilings. However, exposed structural elements in these areas will require painting or a spray-applied fireproofing depending on structural design and compliance with applicable building and fire safety code requirements.

1.5.7.1 Ceiling Height

Minimum allowable clearance for ceilings shall be8 feet, 6 inches above the finish flooring in all room except the Apparatus Bays #135 which shall have a clear height of 17 feet 8 inches to the underside of structure.

1.5.8 Building Demolition and Removal

Building 1518, the existing main fire station, shall be demolished as part of this contract. Building 1518 is located northwest of the new Main Fire Station location, across Prussman Boulevard. The Building Demolition shall be phased and shall not begin until the new Main Fire Station is substantially complete. The critical item will be the relocation of the existing 911 and Dispatch equipment from the existing building into the new Main Fire Station. The relocation and time of relocation of applicable Dispatch/911 equipment shall be fully coordinated with Contracting Officers's representative. The building demolition includes the removal of the building, all interior floor slabs, utility service lines to the building, 3 wooden poles holding the existing "Harlow" antennas, removal of exterior drives, walks, stoops, planters and signage that have the sole purpose of servicing the existing fire station. The pavement shall be removed as indicated in Section 01002: SITE WORK. The demolition of the building shall be complete, including all footings and foundations. Upon completion of the removal, the site shall be fine graded for drainage and established with turf (seed). Records from an asbestos survey dated 16 September 1999 show that there is 42 linear feet of (2-3% Chrysotile asbestos) exterior window putty and 20 square feet of (10% Chrysotile asbestos) on roof flashing tar. There is not any lead based paint present.

1.6 FUNCTIONAL REQUIREMENTS

1.6.1 Equipment and Specialties.

See Specification Sections 01004: INTERIOR DESIGN REQUIREMENTS, 01006: MECHANICAL REQUIRENMENTS, 01007: ELECTRICAL REQUIREMENTS,and 01008: FIRE PROTECTION REQUIREMENTS for furniture and furnishings, mechanical equipment, electrical equipment, and fire protection equipment respectively. The equipment listed herein is not all inclusive and shall be coordinated by the contractor with the building users during the design for completeness with regard to items that have been added, deleted, or where requirements have been altered. There will be an average amount of coordination effort required with the users to understand the particulars of the Equipment and Specialties and some minor changes to the Equipment and Specialties lists could possibly occur. The final equipment locations shall coordinated with the building users as intended for functionality and shall coordinate with the building design, including locations of electrical and communication outlets, junction boxes for furniture systems, mechanical systems, and lighting within the building. See the aforementioned Specification Sections for other equipment, furnishings and requirements. The equipment locations shall also be coordinated with other building features such as architectural elements, thermostats, lighting, power outlets, location of TV's, etc.

1.6.1.1 Definitions/Classification of Equipment

Contractor Furnished/Contractor Installed: CFCI
Government Furnished/Contractor Installed: GFCI
Government Furnished/Government Installed: GFGI

1.6.1.2 Contractor Furnished and Contractor Installed Equipment and Specialties (CFCI). See Interior Design Section for Contractor Furnished and Contractor Installed Furniture as applicable.

Contractor Furnished and Contractor Installed equipment within this facility shall include but may not be limited to the following:

Building Signage and Number
Interior Building Signage
Door Hardware and Miscellaneous Items
Toilet fixtures and accessories, see Section 01006
Recessed Entrance Floor Mats
Recessed and semi-recessed Fire Extinguisher Cabinets, brackets, and fire extinguishers (for 10 lb type A.B.C. fire extinguishers)

Reception counter in Secretary/Receptionist Area #103, workstation shall include: adjustable keyboard, pencil drawer, minimum 2 pedestals, task lighting along length on one of the work surfaces, handicapped height counter segment, and a transition counter. Counters shall be constructed of a solid polymer material.
Other casework (including base and wall cabinets for kitchenette in Break Room #119, countertops forlavatories in Toilet Rooms #110, 112, 126, 157, and 160, base and wall cabinets and countertops for base cabinets, peninsulas and islands in Kitchen #176 and Dining Room #174, and base and wall cabinets for Laundry Room #163. All of these counter tops shall be solid polymer material in accordance with Department of the Navy Specification #06650)
All other Casework, Base Cabinets, Wall Cabinets, Countertops, Sinks, and Hardware with under counter storage for equipment, shelving, storage cabinets, and drawers.

Aluminum windows with solid polymer window stools.

Personnel Doors (Standard, Fire Rated, and Insulated)
Overhead Sectional Vehicle Doors

Built-in wood storage cabinets in Library/Crew Meeting Classroom #166

1.6.1.3 Government Furnished Contractor Installed (GFCI)

Government Furnished and Contractor Installed equipment within this facility shall include the following:

Stand-by Generator

1.6.1.4 Government Furnished Government Installed (GFGI)

Government Furnished and Government Installed equipment within this facility shall include the following:

1.6.1.5 Function/Activity: Entry Vestibule 101

CFCI
Built-in "Knox Box" at exterior wall, fully recessed in the face brick.
Built-in weatherproof telephone for after hour building access, to Dispatch/911 Center.
GFCI

GFGI

1.6.1.6 Function/Activity: Entry Corridor 102

CFCI
Fire Extinguisher Cabinets and Fire Extinguishers as applicable.
CCTV ceiling mounted Camera and Accessories

GFCI

GFGI
Directory/Information Board

1.6.1.7 Function/Activity: Secretary Receptionist 103

CFCI
Built-in radiused Reception Counter with 2 surface heights (1 standing height and 1 sitting and handicapped accessible height).
Built-in wall cabinets at locations shown where there is a full height wall.

GFCI

GFGI
Computer Equipment,
See Drawings, I-series for furnishings and furniture footprint as applicable.
Fax Machine
File Cabinets, lateral type, 3 ea., 3'-0" L, 5'-0" H, 2'-6" D

1.6.1.8 Function/Activity: Waiting Area 104

CFCI
Built in Casework Bench with storage below/within.

GFCI

GFGI

1.6.1.9 Function/Activity: Dispatch/911 Corridor 105

CFCI
8 Double Tier Metal Lockers - 12" x 12" x 72" (36" per tier).
Bullet Proof Door Assembly
Fire Extinguisher Cabinets and Fire Extinguishers as applicable.

GFCI

GFGI
Dispatch and 911 Computer Equipment and associated Computer Equipment Racks.

1.6.1.10 Function/Activity: Dispatch/911 Communications Room 106

CFCI

GFCI

GFGI
Dispatch and 911 Computer Equipment and associated Computer Equipment Racks.

1.6.1.11 Function/Activity: Dispatch/911 Center 107

CFCI
Bullet Resistant Window Assembly
Ceiling Mounted Television Bracket and required support for GFGI television
PA System Accessories
CCTV Monitoring Equipment

GFCI
Existing Reinstalled Antenna Tower
Existing Reinstalled Antennae and Satellite Dishes

GFGI
Dispatch and 911 Computer Equipment and associated Computer Equipment Racks.
Dispatch and 911 Consoles and associated equipment.
Electric Unit Kitchen with 2 burner range, 1 sink, and 1 refrigerator, similar and equal to those built by "Dwyer Products Company).
Computer Equipment
Fax Machine
See Drawings, I-series for furnishings and furniture footprint as applicable.
27-inch Television
Video Cassette Recorder

1.6.1.12 Function/Activity: 911 Supervisor 108

CFCI
Bullet Resistant Window Assembly
Fire Shutters

GFCI

GFGI
Dispatch and 911 Consoles, Radios, Receivers, and associated equipment.
Computer Equipment
Fax Machine
See Drawings, I-series for furnishings and furniture footprint as

applicable.

1.6.1.13 Function/Activity: Toilet 110 and Public Toilet 112

CFCI
Handicapped Accessible
Toilet Accessories
Floor Drain

GFCI

GFGI

1.6.1.14 Function/Activity: Corridors 111, 122, 144, 147, 162, 166, 170 and 171

CFCI
Fire Extinguisher Cabinets and Fire Extinguishers as applicable.
Electric Water Coolers (Standard and Handicapped Accessible) as applicable.

GFCI

GFGI

1.6.1.15 Function/Activity: Radio/Communications Closet 113 and Communications Room 164

CFCI
Telephone Backer Board as required
Telephone, Data, and Communications Building Support Equipment and accessories as required
PA System Equipment and Accessories
GFCI

GFGI
Dispatch and 911 Radios and associated equipment.

1.6.1.16 Function/Activity: Administrative Storage 114

CFCI

GFCI

GFGI
Supply Shelving Units.

1.6.1.17 Function/Activity: Janitor Closet 115 and 159

CFCI
Shelf with 4 Integral Mop Holders
Floor Mounted Mop Sink
Floor Drain

GFCI

GFGI

1.6.1.18 Function/Activity: Conference Room 117

CFCI
Ceiling Mounted Recessed Motorized Projection Screen and Controls, similar and equal to Draper Signature Series
Floor Mounted recessed in floor Duplex Electrical Receptacle centered in room
Floor Mounted recessed in floor Data and Communications Receptacle centered in room
Ceiling Mounted Television Bracket and required support for GFGI television
Ceiling Mounted Retracting Video Projector Mount, similar and equal to Draper LCD Mount
4'-0" x 8'-0" Dry Marker Board

GFCI

GFGI
Computer Equipment
See Drawings, I-series for furnishings and furniture footprint as applicable.
27-inch Television
Video Cassette Recorder
Computer Projector

1.6.1.19 Function/Activity: Conference Room Storage 118, Storage 124, and Storage 175

CFCI
Built-in Closet Shelving and Clothes Rod

GFCI

GFGI

1.6.1.20 Function/Activity: Break Room 119

CFCI
Built-in Base and Wall Cabinets
Single Bowl Stainless Steel Bar Sink with Gooseneck Faucet in Countertop
Water Supply for Coffee Maker
Water Supply for Ice Maker in Refrigerator
Ceiling Mounted Television Bracket and required support for GFGI television

GFCI

GFGI
Refrigerator with Ice Maker
See Drawings, I-series for furnishings and furniture footprint as applicable.

27-inch Television
Video Cassette Recorder

1.6.1.21 Function/Activity: Administrative Support 120

CFCI
Built-in Base and Wall Cabinets

GFCI

GFGI
Computer Equipment
Photo Copy Machine
Fax Machine

1.6.1.22 Function/Activity: Display Area 121

CFCI
Built-in (2'-2" wide x 2'-0" deep x 7'-0" high) Wood Display/Trophy Case with full height Lockable Glass Door/Hardware and 4 Adjustable Glass Shelves (7'-0" high). Any aluminum to have natural finish.

GFCI

GFGI

1.6.1.23 Function/Activity: Dorm Rooms 125, 145, 146, 148, 149, 150, 151, 152, 153, 154, 155, 168, and 169

CFCI
Built-in Wood Desk and Overhead Open Cabinet Unit with 2 Adjustable Shelves under a lowered soffit, plastic laminate writing surface.
2 Built-in Wood Wardrobe/Locker/Closet Units with 11" high drawers at the bottom, hat shelf 1'-0" from the top of unit, clothes hanging rod, lockable doors, and under a lowered soffit. Unit to be a total of 7'-0" high and lockable.

GFCI

GFGI
Computer Equipment
See Drawings, I-series for furnishings and furniture footprint as applicable.

1.6.1.24 Function/Activity: Toilet 126

CFCI
Handicapped Accessible
Toilet Accessories
Built-in Linen Closet with 4 wood shelves
Shower and Base
Shower Curtain Rod, Shower Curtain, and Shower Toilet Accessories

Towel Bars, 36" long, 2 ea.

GFCI

GFGI

1.6.1.25 Function/Activity: Fire Chief Office 127

CFCI

GFCI

GFGI
Computer Equipment
Fax Machine
See Drawings, I-series for furnishings and furniture footprint as applicable.
27-inch Television
Video Cassette Recorder

1.6.1.26 Function/Activity: Shift Leader Office 128

CFCI

GFCI

GFGI
Computer Equipment
Fax Machine
See Drawings, I-series for furnishings and furniture footprint as applicable.

1.6.1.27 Function/Activity: Fire Inspector's Suite 130

CFCI

GFCI

GFGI
Computer Equipment
See Drawings, I-series for furnishings and furniture footprint as applicable.
Fax Machine
File Cabinets, lateral type, 7 ea., 3'-0" L, 5'-0" H, 2'-6" D

1.6.1.28 Function/Activity: Chief Fire Inspector's Office 131

CFCI

GFCI

GFGI
Computer Equipment
Fax Machine
See Drawings, I-series for furnishings and furniture footprint as

applicable.

1.6.1.29 Function/Activity: Storage 132 and 133 (For Fire Inspector's Suite)

CFCI
Built-in Closet Shelving with 4 wood shelves

GFCI

GFGI

1.6.1.30 Function/Activity: Alcove 134, 137, 141

CFCI

GFCI

GFGI

1.6.1.31 Function/Activity: Apparatus Bays 135

CFCI
Trench Drains, Evaporative Type
Emergency Eye washes and Showers, 2 each, with associated floor drains, one each side of Apparatus Bay
Utility Sinks, 2 each, one each side of Apparatus Bay
Fire Fighting Gear Lockers, 2 tier, 18" x 18" x 72" each (each tier is 36" high), 36 total, heavy duty metal mesh/ventilated (some could be located in Corridor 170).
Steel Stairs, Handrails, and Landing up to mezzanine with removable guardrails at landing.
Interior and Exterior Pipe guards at each overhead sectional door
Floor Drains and Condensate Drains as required
Compressed Air and retractable hoses and reels
Water Supply as required. Include Ice Machine

GFCI

GFGI
Ice Machine
Hose Drying Rack

1.6.1.32 Function/Activity: Storage Room 1 and Storage Room 2, 136 and 140

CFCI
Floor Drains
GFCI

GFGI
Heavy Duty Steel Shelving

1.6.1.33 Function/Activity: Disinfection/EMS Decontamination Room 138

CFCI
3 Compartment Stainless Steel Sink Unit with Heavy Duty Faucet

Heavy Duty Steel Shelving
One 3'-0" x 3'-0" Shower and Base
Shower Curtain Rod, Shower Curtain, and Shower Toilet Accessories
Towel Bars, 36" long, 2 ea.
Towel Pins, 6 ea.
Floor Drain
Custom Built Stainless Steel Equipment Wash and Base Drain Area with drain, Stainless Steel Grating/Drip Racks, 5'-0" High continuous Stainless Steel Backsplash, and Heavy Duty Stainless Steel Retainer Clamps
High Pressure Sprayer with 8 foot hose (commercial)

GFCI

GFGI

1.6.1.34 Function/Activity: Fire Gear Cleaning 139

CFCI
Washer/Extractor (for fire gear)
Utility Sink
Heavy Duty Clothes Hanging Hooks, 6 ea.
Compressed Air
Floor Drain(s)

GFCI

GFGI
Heavy Duty Work/Tool Bench (6'-0" wide x 2'-6" deep) with overhead shelving

1.6.1.35 Function/Activity: Wet/Dry Chemical Fire Extinguisher Room 142

CFCI
Floor Drain(s)
Compressed Air
Air Compressor and Accessories
GFCI

GFGI
Heavy Duty Steel Shelving, 3 sets, 3 shelves each, 7'-0" long x 3'-0" deep x 6'0" high, 800 pound shelf capacity

1.6.1.36 Function/Activity: Breathing Apparatus Room 143

CFCI
Compressed Air
Computer Outlet
GFCI
SCBA Compressor and Controls
High Pressure Cylinder, 4 each
Mask Cabinet
Tool Box
PC, Monitor, and Printer
Fill Station
SCBA Units, 30 each

Air Bottles, 75 each
Heavy Duty Steel Storage Racks
Heavy Duty Steel Shelving, 3 sets, 3 shelves each, 7'-0" long x 3'-0" deep x 6'0" high, 800 pound shelf capacity

GFGI

Portable Trailered SCBA Filler Unit

1.6.1.37 Function/Activity: Men's Shower/Locker Room 156

CFCI

3'-0" x 3'-0" Showers and Bases, 3 each
Shower Curtain Rods (6 each), Shower Curtains (6 each), and Shower Toilet Accessories as applicable
Towel Bars, 36" long, 3 ea.
Towel Pins, 6 ea.
11 ea. Double Tier Metal Lockers - 12" x 12" x 72" (36" per tier, total of 22 Lockers), solid panel with venting, upper storage shelf, clothing hanger rod or hooks, and lockable with a padlock.
Floor Drains

GFCI

GFGI

1.6.1.38 Function/Activity: Men's Sinks 157

CFCI

Lavatories (3 each) in full vanity top with backsplash
Glass Mirrors, 3 each, (18" x 30" min.) or full wall mirror
Soap Dispensers (liquid type under counter), 3 each
Paper Towel Dispenser/Waste Receptacle Combination Units, 2 each (fully recessed)
Other Toilet Accessories as applicable
Medicine/Supply Storage Closet with 4 Wood Shelves
Towel Pins, 6 ea.
Floor Drain

GFCI

GFGI

1.6.1.39 Function/Activity: Men's Toilet 158

CFCI

Urinals, 3 each
Urinal Screens as applicable
Toilets, 2 each
Toilet partitions, as applicable with coat hooks
Toilet Tissue Dispensers (recessed in partition type)
Other Toilet Accessories as applicable
Floor Drain

GFCI

GFGI

1.6.1.40 Function/Activity: Women's Toilet 160

CFCI
Lavatories (1 each) in full vanity top with backsplash
Glass Mirrors, 1 each, (18" x 30" min.) or full wall mirror
Soap Dispensers (liquid type under counter), 1 each
Paper Towel Dispenser/Waste Receptacle Combination Units, 1 each (fully recessed)Toilets, 1 each
Toilet partitions, as applicable with coat hooks
Toilet Tissue Dispensers (recessed in partition type)
Sanitary Napkin Dispenser, 1 ea.
Sanitary Napkin Disposer, 1 ea.
Other Toilet Accessories as applicable
3 ea. Double Tier Metal Lockers - 12" x 12" x 72" (36" per tier, total of 6 Lockers), solid panel with venting, upper storage shelf, clothing hanger rod or hooks, and lockable with a padlock.
Towel Pins, 1 ea.

GFCI

GFGI

1.6.1.41 Function/Activity: Women's Shower 161

CFCI
3'-0" x 3'-0" Showers and Bases, 1 each
Shower Curtain Rods (2 each), Shower Curtains (2 each), and Shower Toilet Accessories as applicable
Towel Bars, 36" long, 1 ea.
Towel Pins, 2 ea.
Built-in Bench
Floor Drain

GFCI

GFGI

1.6.1.42 Function/Activity: Laundry Room 163

CFCI
Laundry/Utility Sink, 1 each
Built-in Wall Cabinet over Utility Sink
Built-in shelf over Washer/Dryer Area
Clothes Hanging Rod
Built-in Folding Table/Surface, 2'6" deep min., open underneath, standing height
Floor Drain
Washer and Dryer Utility Connections, 2 ea.
Dryer Exhaust, 2 each
Laundry Room Exhaust

GFCI

GFGI
Washers, 2 each

Dryers, 2 each

1.6.1.43 Function/Activity: Library/Crew Meeting 166

CFCI
Ceiling Mounted Recessed Motorized Projection Screen and Controls, similar and equal to Draper Signature Series
Floor Mounted recessed in floor Duplex Electrical Receptacles centered in room
Floor Mounted recessed in floor Data and Communications Receptacles centered in room
Ceiling Mounted Television Bracket and required support for GFGI television
Ceiling Mounted Retracting Video Projector Mount, similar and equal to Draper LCD Mount
4'-0" x 8'-0" Dry Marker Board
GFCI

GFGI
Computer Equipment
Fax Machine
See Drawings, I-series for furnishings and furniture footprint as applicable.
27-inch Television
Video Cassette Recorder
Computer Projector

1.6.1.44 Function/Activity: Captain's Office 167

CFCI
Key Storage Cabinet

GFCI

GFGI
Computer Equipment
Fax Machine
See Drawings, I-series for furnishings and furniture footprint as applicable.

1.6.1.45 Function/Activity: Physical Training 172

CFCI

GFCI

GFGI
Exercise Equipment
See Drawings, I-series for furnishings and furniture footprint as applicable.
27-inch Television
Video Cassette Recorder
AM/FM Stereo Receiver, Tuner, CD Player, and Cassette Player, 4 Hi-Fi Speakers

1.6.1.46 Function/Activity: Day Room 173

CFCI

GFCI

GFGI
See Drawings, I-series for furnishings and furniture footprint as applicable.
27-inch Television
Video Cassette Recorder
42-Inch flat Screen Television
DVD Player
AM/FM Stereo Receiver, Tuner, CD Player, and Cassette Player, 4 Hi-Fi Speakers

1.6.1.47 Function/Activity: Dining Room 174

CFCI
Built-In Wood Casework Eating Peninsula with accessible storage from each side, and minimum of 2 duplex receptacles at sides

GFCI

GFGI
See Drawings, I-series for furnishings and furniture footprint as applicable.
27-inch Television
Video Cassette Recorder

1.6.1.48 Function/Activity: Kitchen 176

CFCI
Built-In Wood Casework Food Preparation Island with accessible storage from each side, and minimum of 2 duplex receptacles at sides
Built-in wood Base Cabinets
Built-in wood Wall Cabinets
Built-in 30" wide high capacity commercial Dishwasher
Built-in dual basin kitchen sink
Garbage Disposal
Gas Range/Oven, 6 burner, commercial
Kitchen Canopy Exhaust Hood
Floor Drains and Condensate Drains as required

GFCI

GFGI
Commercial Upright Refrigerator
Commercial Upright Freezer
Ice Making Machine
Coffee Maker
See Drawings, I-series for furnishings and furniture footprint as applicable.

1.6.1.49 Function/Activity: Refrigerator/Freezer Room 177

CFCI
Exhaust for Room, adequate exhaust of build up of equipment heat
Floor Drain and Condensate Drain as required

GFCI

GFGI
Commercial Upright Refrigerator
Commercial Upright Freezer

1.6.1.50 Function/Activity: Pantry 178

CFCI
Built-in Closet Shelving with 5 adjustable wood shelves.

GFCI

GFGI

1.6.1.51 Function/Activity: Mechanical/Electrical Room 179, Electrical and UPS Room 180, Mechanical Room 181, and Mechanical Room 202

CFCI
Mechanical and Electrical Building Support Equipment and accessories as required
Floor Drains as required

GFCI

GFGI

1.6.1.52 Function/Activity: Patio

CFCI
Built-in Gas Barbecue Grill
Floor Drain

GFCI

GFGI

1.6.1.53 Function/Activity: Storage Room 201

CFCI

GFCI

GFGI

1.6.1.54 Function/Activity: HAZMAT Storage Building/Room 001

CFCI
4" retaining curb or other means of retaining hazardous materials as required.
Mechanical ventilation/other as required

GFCI

GFGI

1.6.1.55 Function/Activity: Generator Building/Room 002

CFCI
Ventilation as required

GFCI
Emergency Generator, from Building 1518, Contractor to Relocate in New Main Fire Station
GFGI

1.6.2 Occupational Safety and Health

Building design shall comply with OSHA Occupational Safety and Health Standards criteria for all items which must be included in the design to ensure safety compliance.

1.6.3 Handicapped Accessibility

The public spaces of the building, and the Dispatch/911 Center shall comply with handicap accessibility requirements as outlined in the American With Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities. All spaces occupied by fire fighting personnel can be non-handicapped. Handicapped access to the main entrance and the Dispatch/911 Center shall be provided.

1.6.4 Interior Sound and Vibration Control

The facility is located off of the main access to the Post and as such vehicle traffic occurs at all hours of the day and night, therefore sound control within the facility is very important to allow the personnel within the facility to sleep while these situations occur. Standard materials and installation procedures shall be incorporated into the facility development. When constructing walls, floors, ceilings, and roofs, materials shall be selected that will impede transmission of equipment vibrations and noise between rooms and within a room. Interior walls shall extend up to the underside of structure, or be capped with solid ceiling construction as required to limit sound transmission from one space to another. Dorm rooms are to be enclosed in construction that has a minimum STC rating of 45 for walls with a ceiling over the rooms that reduces sound transmission into the area. Minimum STC of 45 is required for walls and doors of the dorm rooms. Concrete masonry walls enclosing , Mechanical/Electrical Room #179, Electrical and UPS Room #180, Mechanical and Generator Room #181, Dispatch/911 Center #105 tthrough 110 shall be sand filled to reduce sound transmission into the space . Windows in Dispatch/911 Center #105 through #110 shall be sound rated to provide a STC of 45. Fire Chief's dormroom #126 walls shall have a minimum STC of 45. Conference Room #117 shall have walls with a minimum of STC 35. Fire Chief's Office #127, Shift Leader's Office #128, and Chief Fire Inspector's Office #131 shall have walls with a minimum STC of 35. Library/Crew Meeting Room #166 walls shall have a minimum STC of 45. Dining Room #173 and Kitchen #175 shall have walls with a minimum STC of 35.

1.6.5 Physical Security

Conventional security measures, such as: door locking hardware, door viewers, cypher locks, electric strikes, card readers, and other means shall be incorporated into the facility design and development. See UFC -4-010-01 for minimum applicable anti-terrorism requiremetns. See also specific paragraphs in this section for additional security criteria.

The Main Entry Vestibule #101 and Vestibule #129 entrances shall have remote locking capabilities controlled from the Dispatch/911 Center. All entrances to the building will have card reader capabilities and all occupants entering and exiting the facility shall be visually monitored by CCTV.

Blast Resistant and Fragment Retention glass and frame system shall be provided to exterior windows to minimize the spread of glass fragments when glass is shattered. The inner pane of insulating glass units for windows and doors shall be a minimum of 1/4-inch thick annealed laminated glass.

Access to roofs shall be controlled.

1.6.6 Composition of Masses and Spaces and Architectural Details to Reflect the Desired Image, and the Scale and Nature of the Activities Involved

Features of scale such as horizontal banding, and changes in material and texture shall be used to tie the building together with the ground line and adjacent volumes and masses. Colors and materials selected for the exterior of this buildings shall be match those defined in the Installation Design Guide Guide, Fort Carson, CO and the enclosed documents and drawings.. Materials selected shall be compatible with "commercial" construction.

1.6.7 Economy of Building Construction, Operation, and Maintenance: Life-Cycle Cost Effectiveness

1.6.7.1 Economy

All materials shall be readily available within the local area, as shall sufficient trades to construct the building.

No special or unique forms of construction shall be used and skilled workers within the area shall be familiar with the proper methods required to build this facility.

1.6.7.2 Operations and Maintenance

Material selections shall be based upon reducing operation and maintenance costs. All materials shall be easy to clean and resist soiling.

1.6.8 Design Requirements

The following is a general description of each activity, approximate occupancy, overall function and other special requirements. See Furniture Footprint Drawings (I-Series) for additional information on furnishings and furniture and Electrical Requirements in Section 01007.

Rooms

MAIN ENTRY VESTIBULE 101/VESTIBULES 129

Floor: Porcelain Tile. A decorative tile pattern shall be provided. Recessed Floor Mat shall also be provided.
Floor Base: Porcelain Tile
Walls: Gypsum WallBoard - Painted
Ceiling: Gypsum Wallboard, (ceiling height - 9'-0")
Notes: Install fully glazed doors and door frames and sidelites as shown on the drawings. See hardware for additional information.

Function: Vestibules serve as an energy thermal barrier.

MAIN ENTRY CORRIDOR 102

Floor: Vinyl Composition Tile. A decorative vinyl composition tile pattern coordinated with adjacent finishes shall be provided.
Floor Base: Resilient Base
Walls: Gypsum WallBoard- Painted
Ceiling: Gypsum Wallboard and Acoustical Panels (ceiling height 9'-0" minimum, but varies as ceiling is open to above.)
Notes: Install fully glazed doors and door frames and sidelites as shown on the drawings. See hardware for additional information.

Function: Serve as a greeting area and is a space that needs to provide a positive first impression to visitors.

1.7 TECHNICAL REQUIREMENTS

1.7.1 Miscellaneous Metals

Information regarding miscellaneous metals shall be referenced to the Unified Facilities Guide Specifications (UFGS), SECTION 05500, MISCELLANEOUS METALS for design criteria and minimum quality requirements.

1.7.1.1 Steel Pipe Handrails & Guardrails

Handrails and guardrails shall meet the requirements of OSHA. All structural components of the handrails and guardrails system shall be covered with a coating system at interior locations.

1.7.1.2 Access Doors and Panels

Access doors and panels shall be flush type. 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-inches 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 and a keyed operated latch. Exposed metal surfaces shall have a shop applied prime coat. Finished paint coat shall match surrounding surfaces. Panel shall be installed in unhabitable rooms (i.e., closets, janitor closets, mechanical rooms) and/or non-conspicuous locations.

1.7.1.3 Miscellaneous

Detailing and construction of louvers, motorized dampers, and ductwork shall be fullycoordinated. Color shall be compatible with wall material color and shall be approved as part of the color board and in accordance with the Fort Carson Installation Design Guide. All louvers shall be storm proof type to not allow entrance of wind blown precipitation. All louvers shall have bird screen mounted on the interior side of the louver.

1.7.2 Finish Carpentry

Information regarding finish carpentry shall be referenced to the Unified Facilities Guide Specifications SECTION 06200, FINISH CARPENTRY for design criteria and minimum quality requirements.

A. Fire retardant treated lumber shall not be used in this facility except at electrical and communication panel board locations.

B. All interior wood molding, shall be of the red oak species, Grade 1 in accordance with the grading rules per AWI. All interior wood trim items shall be stained and finished to coordinate with interior color scheme.

C. Wood chair rails shall be molded solid oak, sanded smooth, and a minimum 2 1/2 inch in height. Wood chair rail shall be a decorative molding with several curvature moldings. Chair rail trim shall be installed at 30 inches above the finished floor. Final mounting height and dimensions shall be coordinated.

D. Wood molding and other interior wood trim pieces shall be solid oak, sanded smooth and finished to match the wood doors and other trim.

E. Shelving shall be a prefabricated particle board, 3/4-inch thick with a curved edge or 3/4-inch plywood with a continuous hardwood edge would be considered acceptable. All shelving shall be painted. Utility shelving shall be provided at locations shown on the drawings.

F. Clothing rods shall be an aluminum pipe or tubing 1 inch in diameter.

G. Window Stool shall be a solid surfacing material and shall be provided at each exterior window location. Material and decorative edge treatment characteristics shall match solid surface countertops. Window stool shall have a minimum one inch overhang at the wall/stool location.

1.7.3 Roof Design

1.7.3.1 Standing Seam Metal Roofing System

Information regarding the roof shall be referenced to the Unified

Facilities Guide Specifications (UFGS) for the following sections:

SECTION 07131, ELASTOMERIC SHEET WATERPROOFING,
SECTION 07720A, ROOF VENTILATORS, GRAVITY-TYPE,
SECTION 07220, ROOF AND DECK INSULATION,
SECTION 07416A, STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM,
for design criteria and minimum quality requirements.

A. This facility shall be covered with a standing seam metal roof system. The critical aspects of the roofing system shall be appearance, and minimal maintenance. Roof panels shall have a Kynar 500 finish with minimum paint thickness of 1.0 mils.

B. All roofing areas (except as otherwise noted shall have roof slopes a minimum of 4-inches per 12-inches . Provide the minimum roof slopes as shown on the drawings. Roof system shall meet the wind uplift requirements calculated based on the criteria given in SECTION 01005: Structural Requirements. The standing seam metal roof system shall consist of the standing seam metal roof on concealed clips, fastened to steel roof purlins, an ice and water shield, rigid insulation (thickness as required to meet the RSI value specified herein), continuous vapor retarder membrane, over a structural steel roof deck. The roof design presented in this document has been approved by the Post, alternate roof designs can be submitted for approval by the Post and the Corps of Engineers.

C. Primary roof slope shall be accomplished by sloping of the structural roof framing members to a gutter and downspout drainage system. The Civil Requirements Section and the enclosed drawings identify which downspouts are discharged onto a splash block and which ones are connected into the underground storm sewer system.

D. Roof system shall provide a 20 year minimum warranty.

E. Lightning protection shall be fully integrated and coordinated with the roofing detailing, and installation to not jeopardize in any way the roof warranty.

F. The roofing panels and concealed clips shall be capable of supporting a minimal uniform live load as calculated by the criteria defined in Section 01005: Structural Requirements.

G. Roofing panel shall be free to move in response without damage to expansion and contraction forces resulting from a total temperature range of 220 degrees F.

H. External reinforcement to improve uplift resistance, such as clamps on the ribs, and/or bolts through the seams is not considered acceptable.

I. The roofing panel finish shall be a factory applied baked-on fluoropolymer topcoat over a factory applied prime coat.

The exterior coat shall consist of a nominal 2 mil thickness consisting of a polyvinylidene fluoride topcoat and the paint manufacturer's recommended primer of not less than 0.2 mil thickness.

The interior coat shall consist of a nominal 1 mil thick

polyvinylidene fluoride finish otherwise the same as the exterior and the paint manufacturer's recommended primer of not less than 0.2 mil thickness.

J. The roofing panel salt spray panel test shall receive a rating of 10 (no blistering) and a rating of 8 (3/64-inch failure) per ASTM D 714.

K. The roofing panel abrasion resistance test shall withstand a minimum of 80-100 liters.

L. A separate vapor retarder membrane (also referred as a vapor barrier) membrane shall be laid directly over the roofing deck and under the rigid insulation. The vapor retarder shall be laid over the entire facility roofing area. Care shall be exercised to not damage or rupture the vapor retarder membrane during it's installation or the installation of other roofing system components.

M. A continuous 60 mil ice and moisture water barrier membrane shall be installed at all roof eave, roof ridge, and valley conditions. The membrane shall extend a minimum of 36 inches up from the eave roof edge and on either side of the ridge and valley center line.

N. Provide snow guard (fence type) protection on the roof over all personnel and vehicle doors and adjacent walkways to the facility. Snow guards shall be an integral part of the roofing system and covered under the warranty furnished by the roofing manufacturer. Snow guard finish shall match that of the roof system. Adhesively applied snow guards shall not be permitted.

1.7.3.2 Roof Insulation

A. Roofing insulation shall be a polyisocyanurate type. A minimum aged "R" value of the roofing insulation shall be R-33, based upon a R-5.56 per 1-inch of thickness. Therefore, the total roofing insulation thickness allowed shall be a minimum 6-inches.

B. A single ply vapor barrier shall be installed between the roofing deck and the bottom of the roofing insulation. The thickness of the vapor barrier shall be in accordance with the roofing system standard thickness. The installation shall be in accordance with government supplied specification Section 07220 Roof Insulation.

C. Sheets shall be installed with the maximum sizes possible in order to minimize cuttings.

1.7.3.3 Roof Ventilators

A. Roofing penthouse ventilator shall be designed for wind speeds of not less than 36 meters per second (80 mph).

B. All roofing ventilators are stationary units.

C. Ventilator paint finish thickness shall match the roofing panels.

D. Bird screen shall be provided on each ventilator. Screens shall be furnished by the ventilator manufacturer and easily removed for periodic maintenance.

E. See Mechanical Requirements for additional information.

1.7.4 Exterior Insulation and Finish System (Not Used)

1.7.5 Factory Insulated (Foamed in Place) Pre-Finished Flush Metal Siding Wall Panels

Information regarding general pre-finished and factory insulated (foamed in place CFC free)flush metal wall panels shall be referenced to the Unified Facilities Guide Specifications SECTION: 07413, METAL SIDING for design criteria and minimum quality requirements. The panels shall be finished with a high performance architectural coating that shall be warranted for 20 years. Oil canning of the panels shall not be allowed.

A. The wall panels and fasteners shall be designed to withstand wind loads normal to the plane of the wall as calculated by the criteria defined in Section 01005: Structural Requirements

B. Vertically oriented wall panels shall be flush architectural type and shall have a stucco embossed exterior face. Flush is defined as a relatively smooth exterior profile with slightly grooved striations not more than 1mm (1/32") which can add a very light shadow line and as required for additional panel strength and to prevent oil-canning of the panels. Exterior skin shall be 24 gage minimum.

C. The interior face of the wall panel shall have the same paint dry film thickness as the exterior metal panels.

D. The wall panel salt spray panel test shall receive a rating of 10 (no blistering) in accordance with ASTM D 714. The panel shall also have a rating of 10 with no edge creep failure at scribe per ASTM D 1654.

E. The panel formability test shall have been bent over a 1/8 or 3T, whichever is greater, in accordance with ASTM D 522 and show no evidence of fracturing to the naked eye.

F. The panel shall show no evidence of blistering and cracking when subjected to a humidity test for 1500 hours in accordance with ASTM ASTM D 2247. Panels shall be G90 galvanized.

G. The wall panel abrasion resistance test shall withstand a minimum of 80-100 liters.

H. A specular gloss value of 30 to 70 at a 60 degree angle. The wall panel color shall be in accordance with the Fort Carson Installation Design Guide and shall be semi-gloss in appearance.

I. Factory insulated wall panels shall have a UL or FM approval for Class I non load bearing wall panels. Panels shall have a flame spread not higher than 25 and a smoke development rating not higher than 450 in accordance with ASTM E 84.

J. Wall panels shall be double interlocking tongue and groove panels with concealed fasteners.

K. Interior panel skin shall be 26 gage minimum 2100 mm (7 ft.) in height above the finished floor. A matching metal 4 inch base trim shall be provided. Panels and base and accessories shall have a factory applied baked enamel finish.

L. Laminated wall panels shall not be permitted.

M. Panels shall be 2 1/2" thick and shall have an R-value of 15 minimum.

1.7.6 Sheet Metalwork, General

Information regarding general sheet metalwork shall be referenced to the Unified Facilities Guide Specifications SECTION 07600, FLASHING SHEET METAL for design criteria and minimum quality requirements.

A. Contractor shall include a quality assurance plan which includes a checklist of points to be observed, prior to start of roofing work.

B. All interior cavity thru-wall flashing shall be a metal type. A non-metal elastomeric ply sheeting is not considered to be acceptable.

C. Metal fascias, trim, and soffits shall have "V" crimps and a stable substrate as required to prevent "oil-canning" effect.

D. All sheet metal work shall be done in accordance with SMACNA plate standards and recommendations.

E. Downspouts and gutters shall have a factory finish applied. Galvanized or field applied painting is not considered acceptable. Downspout boots shall be provided to attach the downspouts to an underground drainage system where required.

F. All exposed ductwork shall be oval or round and painted to match adjacent areas.

G. All louvers shall be designed and constructed with bird screens. Louver design shall be such as to prevent wind blown snow and rain from entering the building.

1.7.7 Doors

Information regarding doors shall be referenced to the Unified Facilities Guide Specifications for the following sections:

SECTION 08110, STEEL DOORS AND FRAMES,
SECTION 08120, ALUMINUM DOORS AND FRAMES,
SECTION 08210, WOOD DOORS,

SECTION 08331A, METAL ROLLING COUNTER DOORS
SECTION 08361, SECTIONAL OVERHEAD DOORS

for design criteria and minimum quality requirements.

General

A. All exterior steel and aluminum door frames shall have a thermal break to prevent temperature transferring. Steel door frames shall be used with only hollow metal doors and aluminum door frames shall be used only with aluminum doors. All pressed steel door frames for all types of doors located in masonry walls shall be one-piece welded construction grouted

full, with a minimum of 3 anchors per each jamb.

B. All exterior doors shall be complete door and frame assemblies which include; weatherstripping, door bottoms, and thresholds. All exterior personnel doors shall have overhead door stops as indicated herein, and an additional floor stop to prevent the doors from bending and racking when caught by the wind. The stops shall be adjusted so both stop the door at the same degree of opening..

C. All exterior doors opening on to a structural concrete stoop and shall conform to NFPA #101 for floor slope at the door.

D. Doors in fire rated walls shall be fire rated according to the fire rating requirements of the walls in which they occur. All fire doors shall be in accordance with the requirements of NFPA #101.

E. Typical personnel door leaf (single) size for wood, aluminum , and steel shall generally be 3'-0" wide x 7'-0" high x 1 3/4" thick.

F. All doors from corridors to administrative office suites that have door closers shall have magnetic hold-open devices that are tied into the buildings smoke detection and fire alarm system. The activation of a detector or alarm shall release the doors.

1.7.7.1 Steel Doors and Frames

A. All exterior personnel service and exit doors shall be a flush insulated steel door type with minimum 10-inch x 10-inch vision panels as appropriate except doors to Mechanical, Electrical, and Communications Rooms. Doors and frames shall have a designation G60 galvanized. Exterior door frames shall be a one-piece frame unit.

B. All interior personnel doors that are not wood doors shall be a flush hollow metal door type with minimum 10-inch x 10-inch vision panels except doors to Secure Areas, Janitor Closets, and Communication Rooms. Doors and frames in steel stud and gypsum wallboard walls shall have a designation A40 galvanized. All interior door frames shall be a one-piece or "dry-wall" frame unit with the "wrap-around" edges.

C. All exterior and interior steel doors and frames shall be factory primed and field finished.

D. All exterior steel doors such as for Mechanical and Electrical Rooms shall be heavy duty with a minimum of 16 gauge face sheets with 16 gauge pressed steel door frames, shall be weather tight and weatherstripped, and insulated to meet a minimum R-value of 7.

E. All interior hollow metal single and double doors located between the Apparatus Bays and the administrative portion of the facility, shops, operations areas, any occupied area, and corridors shall be fire rated according to the fire rating requirements of the walls in which they occur and shall meet the minimum exterior door thermal insulation requirements.

F. All hollow metal door construction shall meet or exceed heavy duty (Grade II) requirements. Door and door frame construction shall be rated according to the fire rating requirements of the walls where they are shown.

1.7.7.2 Aluminum Doors and Frames

A. All exterior personnel entrance doors shall be aluminum doors and incorporated into store front window wall systems as applicable and as shown on the elevations. All front and secondary entry vestibule doors, other personnel entry doors at corridors, and door from the Dining Room shall be insulated medium stile aluminum doors, full glazed with integral divided lites, with an anodized aluminum finish. The glass in the exterior vestibule doors shall be 1-inch insulating laminated glass. The glass in the interior vestibule doors shall be 1-inch laminated glass. The glass in the exterior vestibule doors shall be tinted to match the exterior glazing and the glass in the interior vestibule doors shall be clear. Adjacent glazing shall match the door glazing in color.

1.7.7.3 Wood Doors

A. All interior wood doors shall be flush solid core wood type doors with minimum 4-inch x 24-inch vision panels, except doors to private offices within office suites, toilets, and janitor closets, or unless noted herein or on the drawings on the drawings otherwise. Spaces that are exclusively administrative shall have wood doors. This includes all doors to suites from corridors. Doors to Conference Room shall be fully glazed wood doors with divided lites.

B. Doors shall be 5 ply or 7 ply construction with premium grade, book matched red oak veneer with oak edges set in pressed steel door frames per Unified Facilities Guide Specification 08210.

C. A natural transparent finish over a light stain with a medium rubbed effect shall be applied to all interior doors.

D. Interior wood bi-folding doors shall be constructed of solid core wood consisting of premium grade red oak, in accordance with Unified Facilities Guide Specification 08210. All door shall be flush type.

1.7.7.4 Sectional Overhead Doors

A. Sectional overhead doors shall be provided as shown on the drawings. Overhead doors shall be a minimum 3-inch thick, heavy duty commercial standard lift type designed to slide up and back into a horizontal overhead position. All overhead sectional doors shall be coordinated with all other systems including but not limited to diesel exhaust system and other equipment.

B. The typical sectional overhead door and door support frame for large doors of the Apparatus Bays shall provide a minimum 15'-2" clearance height and a minimum width clearance of 14'-0". The smaller overhead sectional doors of the Apparatus Bay for administrative vehicle (Fire Chief, Shift Leader, and Chief Fire Inspector)shall provide a minimum 15'-2" clearance height and a minimum width clearance of 12'-0". The smaller overhead sectional door for the Breathing Apparatus Room 143, shall provide a minimum 7'-4" clearance height and a minimum width clearance of 7'-4".

C. Doors shall be designed to withstand a minimum wind load as calculated by the criteria defined in Section 01005: Structural Requirements.

D. Doors shall be equipped with torsion springs designed to operate through a minimum of 100,000 cycles. Each door shall be equipped with electric sensing edge to avoid entrapment.

E. Door exterior panel section shall be constructed of hot-dipped galvanized steel not lighter than 16 gauge. Panel sections shall be insulated and shall provide a minimum R-value of 14.5 and concealed with an inner galvanized panel section not lighter than 24 gauge.

F. Vision lites shall be glazed with DSB glass. All overhead doors shall have a minimum of three 24-inch x 12-inch windows with insulating glass, as standard with the manufacturer.

G. Door operation shall be by means of electric power operators with an auxiliary emergency chain hoist operator for use in the event of a power failure. All door must be capable of opening within a maximum of 20 seconds, and close no faster than 30 seconds. All door shall be electrically controlled by remote controls. Doors shall be equipped with special signaling system, with red and green lights. The green light signal will turn on when the door is in the fully open position. The signaling system shall be located on the driver's side of each door, mounted approximately 6'-0" above the finished floor.See ELECTRICAL REQUIREMENTS for additional information on the door motors, switches and power operations.

H. Door shall be factory primed and finish paint coating shall be a factory applied baked-on enamel finish.

1.7.7.5 Metal Rolling Counter Doors

A. Metal rolling counter door, frame, guides, and hood shall be fabricated of stainless steel. Door slats shall be a minimum of 22 gauge thickness. Curtain door shall be have a padlock locking capability on the inside of the room door side. Door shall be manually operated.

1.7.7.6 Special Doors

A. Doors and frames located at rooms and walls shown or identified with STC requirements shall meet or exceed the shown or identified STC requirements. Completed and installed door assemblies shall be tested to ensure compliance with the shown STC requirements.

B. Door frames for double doors located where STC ratings are required will be furnished with a removable mullion frames for movement of large items through the opening.

1.7.8 Hardware; Builder's (General Purpose)

Information regarding door hardware shall be referenced to the Unified Facilities Guide Specifications, SECTION 08710, DOOR HARDWARE for design criteria and minimum quality requirements and as specified herein.

1.7.8.1 Hinges

All hinges shall be grade I with a minimum of 3 hinges per door for a single type door for doors 7'-0" high. Excessively heavy (sound doors) or tall doors shall have additional or special hinges provided as recommended by the door manufacturer. Hinges shall be fully recessed (mortised)and fit flush within designated frame slots.

All exterior doors shall have a A5111 type hinge, unless noted otherwise.

All interior doors shall have a A8111 type hinge, unless noted otherwise.

1.7.8.2 Locks and Latchsets

All exterior and interior door locks and latchsets shall be series 1000 mortised type.

1.7.8.3 Lock Cylinders

Lock cylinders shall not be less than seven pins.

Cylinder shall have key removable type cores. Disassembly of knobs, levers and locksets shall not be required to remove core from lockset.

Provide a minimum of 5 spare cores, 2 blank master key sets and 10 blank keys.

1.7.8.4 Lock Trim

The doors of this facility shall have lever handles. All exterior doors having panic type fire exit hardware with lever handles opposite the exit device as exterior trim.

All exit devices installed on hollow metal and aluminum doors shall be Type 6 (Narrow Stile Concealed Vertical).

All exit devices installed on wood doors shall be Type 4 (Narrow Stile Rim Exit Device).

1.7.9 Keying

Locks and special key hardware shall be keyed to the Fort Carson master key system or equal compatible lock system with interchangeable cores.

A grand master keying system shall be provided. All of the keys shall be keyed in one series, except the mechanical, electrical and communication equipment rooms. This lock keying shall be compatible to the Post's locksmith requirements. All locks and special key hardware shall have interchangeable cores. The keying schedule shall be coordinated with the User through the Corps of Engineers.

Locks for all mechanical, electrical, and communications equipment rooms shall be keyed to the existing Base utility keying system.

1.7.10 Door Closing Devices

Surface type overhead door closures shall be Grade 1, Series CO2000 Standard Cover. Closures shall be size VI.

1.7.11 Auxiliary Hardware

Door floor stop and holder for exterior doors shall be Type L01371.

Door wall stops shall be Type L02251.

Door floor stop and holder for interior doors (without thresholds) shall be Type L02141.

Door floor stop and holder for interior doors (with thresholds) shall be Type L02161.

Lever extension flush bolts shall be type L04081.

Metal thresholds shall be Type J16130.

Door protection plates including armor, kick, and mop plates shall be provided for all doors subject to cart traffic and other impacts. Door protection plates shall be stainless steel, type J102 and J103_finish to match the finish of the door lock.

All exterior doors shall have aluminum housed type weather seals.

All fire and smoke rated doors shall have compression type seal gasketing. All fire rated doors from offices or office suites opening onto corridors shall have magnetic hold-open devices activated by a smoke detector or the fire alarm system to close the door.

Door floor stop and holder shall be Type L01371.

All sound rated doors shall have sound seals and automatic door bottoms.

All exterior doors shall have a metal thresholds shall be Type J16190.

All exterior doors shall have a metal thresholds shall be Type J16190.

All doors identified to be insulated shall have weather seals.

1.7.12 Finishes

Door hardware finish shall match satin stainless steel Type 630.

1.7.13 Door Hardware

1.7.13.1 Hardware Requirements

Door hardware in fire rated walls shall comply with NFPA and other applicable criteria.

1.7.13.2 Hardware Sets

The following hardware sets listed are the minimum functional hardware requirements for each door types. Additional hardware may be required for

each door type beyond that listed below.

a. Exterior Aluminum Doors

All single exterior personnel doors shall have the following hardware features:

Grade 1 hinges - Stainless Steel or as standard with mfr.

Exit device, Type ,Function _
Overhead closer - Type C02021
Overhead holder stop
Floor Stop
Weatherstripping
Threshold
Kick plate
Rain drips
Card Reader Access
Magnetic Lock
Provide close circuit television camera at doors to monitor in Dispatch/911 Center

Main Entry Vestibule #101 Door and double exterior personnel doors shall have the following hardware features:

Grade 1 hinges - Stainless Steel or as standard with mfr.
Exit device Type __, - Function 01, pull trim), (each door)

Card Reader Access
Magnetic Lock
Provide close circuit television camera at doors to monitor in Dispatch/911 Center
Overhead closers, - Type C02021 (each door)
Overhead holder stop (one each door)
Floor Stop (1 each door)
Weatherstripping (each door)
Threshold - continuous
Kick plates
Rain drips

b. Insulated Exterior Hollow Metal Doors

(1) All single exterior personnel doors shall have the following hardware features:

Grade 1 hinges

Exit Device, Type 1, F__,Mortise Device
Overhead closer - Type C02021
Wall or Floor stops
Overhead holder stop
Kick plate
Weatherstripping
Threshold
Rain drips

(2) All double exterior mechanical room, electrical room doors shall have the following hardware features:

Grade 1 hinges
Mortise lockset hardware F07(key locking capabilities on active leaf)
Overhead closer - Type C02021 (active leaf)
Lever extension flush bolts (inactive leaf)
Overhead holder stop (active leaf)
Wall or Floor stops (active and inactive leaf)
Kick plates
Weatherstripping
Rain drips
Thresholds

c. Interior Doors

(1) All single doors used in offices, conference room, library/crew meeting room, janitor's closets, storage rooms, fire fighting agent storage, protective clothing laundry, disinfection room, fire extinguisher maintenance, shall have the following hardware features:

Grade 1 hinges
Mortise lockset hardware (key locking capabilities - avoid self locking hardware.)
Overhead closer - Type C02021 (as required)
Kick plate
Wall stops (with holder where appropriate)
Gaketting (as required)

(2) All double doors in the path to the apparatus room shall have the following hardware features:

Grade 1 hinges
Surface vertical rod exit devices
Overhead closer - Type C02021 (both leafs)
Kick plates
Wall stops or Floor stops (with holder where appropriate)

(3) All single doors from or to the apparatus room including storage rooms, fire fighting agent storage, protective clothing laundry, disinfection room, fire extinguisher maintenance shall have the following hardware features:

Grade 1 hinges
Surface vertical rod exit devices
Overhead closer - Type C02021
Kick plates
Wall stops or Floor stops (with holder where appropriate)

(4) All single doors into dorm rooms shall have the following hardware features:

Grade 1 hinges
Mortise privacy lockset hardware
Overhead closer - Type C02021
Wall stop
Kick plate
Gaketting

(5) All single doors in classroom, recreation room, dinning room, and day room shall have the following hardware features:

Grade 1 hinges
Exit device, Type __, F__
Overhead closer
Wall stop
Kick plate
Gaketting

(6) All single doors in toilet/locker rooms shall have the following hardware features:

Grade 1 hinges
Mortise privacy lockset hardware
Overhead closer (as required
Wall stop
Kick plates

(7) All single doors into single water closet toilets shall have the following hardware features:

Grade 1 hinges
Mortise privacy lock hardware
Overhead closer
Wall stop
Kick plates

(8) All closets with bi-folding doors shall have the following hardware features:

Hook lock hardware standard for bi-folding doors.

(9) Single full glass door into conference room shall have the following hardware features:

Grade 1 hinges
Cypher lock hardware
Electric strike with switch on dispatch unit console
Overhead closer
Wall stop
Kick plate

1.7.14 Key Storage System

A surface mounted wall mounted key cabinet shall be provided in the Captain's Office #167, and contain all additional keys for all areas of this building. Cabinet shall have the capacity to store a minimum of two keys for each room on an individual key hook plus an additional capacity of 25 percent. Key hooks shall be mounted on panels with sufficient distance between hooks that will allow easy identification and removal. Cabinet key panels shall be readily removable and capable to insert additional panels for expansion needs. Key cabinet shall have key locking capabilities. Cabinet door shall be a full height piano hinge.

1.7.15 KNOX Box Exterior Key Storage

The contractor shall provide a wall mounted single "KNOX Box", used to house a building key for fire department use. The location of the Knox Box shall be in an exterior wall at the main entry in a location approved by the Fire Department. The Knox Box shall be a #3200 series from the Knox Company, color shall be manufacturer's standard black, size shall be 5" x

4" x 3". The box is to be keyed to the Fort Carson Fire Department access keying system. Coordinate the location and alarm coding with the Fire Department. A grand master key to the building shall be provided within the Knox Box.

1.7.16 Aluminum Window Frames and Entrances

Information regarding aluminum windows shall be referenced to the Unified Facilities Guide Specifications, SECTION 08520A, ALUMINUM AND ENVIRONMENTAL CONTROL ALUMINUM WINDOWS for design criteria and minimum quality requirements.

Due to Anti-Terrorism/Force Protection requirements for this facility, all exterior window frame units shall have a frame system designed to prevent window and glass assembly from dislodging from the wall construction and window frame in a blast event. Frame shall be anchored accordingly. Added bars are not acceptable.

Window manufacturer shall specialize in designing and manufacturing the type of aluminum windows specified in this section, and shall have a minimum of 10 years of documented successful experience. 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. Aluminum window shall generally be 3'-4" wide by 3'-4" high and in the arrangement indicated on the drawings.

Windows construction shall consist of an aluminum frame with a continuous thermal break. Performance rating of these windows shall be a HC 65 or greater in accordance with performance rating testing with AAMA 101. Windows shall have a U value of not greater than 0.50 and a solar heat gain coefficient of 40 or less. These windows shall include a 1-inch minimum insulated glazing unit as specified in Section 08810A, GLASS AND GLAZING and further defined herein. Window frames shall have a color anodized finish.

1.7.17 Aluminum Storefront

Aluminum storefront shall be used for the glazing of the Dining Room, Library/Crew Meeting Room, and various corridor locations. The storefront shall match the performance specifications for aluminum windows.

1.7.18 Interior Windows

Interior windows shall consist of pressed steel frame sections with applied stops and shall be provided to increase the amount of day lighting into the room and for visual control. The glass shall be laminated type.

1.7.19 Glass and Glazing

1.7.19.1 Insulated Laminated Glass

Information regarding glass and glazing shall be referenced to the unified Facilities Guide Specifications, SECTION 08810A, GLASS AND GLAZING for design criteria and minimum quality requirements.

Due to Force Protection requirements for this facility, all exterior insulated glazing units will require the inner glass unit be a laminated thermally tempered type glass. All exterior glazing units shall be installed in a manner which prevents the window and glass assembly from

dislodging from the wall construction and window frame. A "wet" glazing method which provides a completely filled and continuous sealant glazing and continuous sealant bond between the glazing unit and frame will be used. Glazing colors shall be tinted in the blue-green light. All exterior glazing units shall be a Low-E type units.

1.7.19.2 Insulated Laminated Glass- Low-E Unit

Insulated laminated type glass for door and window applications shall be a minimum of 1-inch thick. Glass panel shall consist of two - 1/4-inch glass panes separated by a 1/2-inch air space and hermetically sealed. Glass for exterior lite shall be Type I annealed glass, Class 1- clear, Quality q3- glazing select low "E" and laminated glass for the interior lite. All insulated glazing units shall be tinted light blue-green. Glass shall not be reflective. See also requirements for windows and glass.

1.7.19.3 Glass Mirrors

All glass mirrors shall be Type I transparent flat type, Class 1-clear and 1/4-inch thickness.

1.7.19.4 Laminate Glass

Laminated glass for interior applications such as interior door side-lites shall be Class 1- clear, Condition A uncoated surface, Quality q3- glazing select. Laminate glass shall consist of two layers of Type I transparent heat strengthen glass bonded together with a PVB plastic inter layer.

1.7.20 Gypsum Wallboard and Steel Studs

Information regarding gypsum board and steel studs and furring shall be referenced to the Unified Facilities Guide Specifications, SECTION 09250, GYPSUM BOARD for design criteria and minimum quality requirements.

Manufacturer shall have specialized in the manufacturing of these material products for a minimum of 10 years of documented experience.

Installer shall have a minimum of 5 years of documented experience.

All gypsum wall board shall be a minimum of 5/8-inch thick, and meet the requirements of ASTM C 36, ASTM C442, ASTM C 475, designed with a minimum 10 psf and a deflection of L/240. Gypsum wallboard partitions shall be type "X" fire rated where required for partitions where one-hour fire resistant construction is required or shown. All walls or partitions that are shown or required to be fire rated and/or sound rated shall extend to the underside of the roof or floor deck above. All walls or partitions that do not extend to the underside of the roof or floor deck shall terminate not less than 6-inches above the ceiling and be braced from the top of wall to structure above as required to meet minimum deflection requirements specified herein. Wall terminating at the underside of decks and walls that are braced overhead shall accommodate deflection in the structure above.

All steel studs shall be placed at a maximum distance 16-inches on-center. Steel studs in exterior walls supporting masonry, brick veneer, and other exterior wall material shall be spaced and have a gage that will have a maximum deflection of L/600 (per Technical Note 28B, page 9, by the Brick Institute of America) under full wind load as calculated by the criteria defined in Section 01005: Structural Requirements.

Predecorated gypsum wallboard is not acceptable.

Exterior gypsum soffit board is not acceptable.

Water-resistant gypsum backing board used as a substrate to receive ceramic tile is not acceptable.

Steel studs to receive ceramic wall tile shall be a minimum of (20 gage).

1.7.21 Tile

Information regarding floor and wall tile shall be referenced to the Unified Facilities Guide Specifications, SECTION 09310, CERAMIC TILE, QUARRY TILE, AND PAVER TILE for design criteria and minimum quality requirements.

Floor tile in toilets, vestibules, vending area, and laundry shall be installed in accordance with Tile Council of America (TCA) method F121. Floor tile in showers and shower drying areas shall be installed in accordance with Tile Council of America (TCA) method B415.

Wall tile in toilets, locker rooms, and shower areas shall be installed in accordance with Tile Council of America (TCA) method W202 or or W244.

Marble or natural stone thresholds shall be provided at all flooring transition locations involving tile and different materials.

1.7.22 Ceilings

1.7.22.1 Gypsum Board Ceiling

All gypsum wallboard ceilings shall have a light textured finish except in the toilets, showers, locker rooms, laundry room, and janitorial closets. Ceiling in the toilets, shower/locker rooms, laundry room, and janitorial closets shall have a smooth gypsum board ceiling. All gypsum wallboard ceilings in showers areas shall be water resistant gypsum wallboard. Provide support framing spaced at not more than 12-inches apart and as required to adequately support water-resistant gypsum wallboard ceilings.

1.7.22.2 Acoustical Tile Ceiling

Information regarding acoustical ceilings shall be referenced to the Unified Facilities Guide Specifications, SECTION 09510, ACOUSTICAL CEILINGS for design criteria and minimum quality requirements.

Acoustical ceiling system shall be a 24-inches x 24-inches exposed grid type. Acoustical panels shall have a square edge and recessed where the exposed grid system supports the panels. Characteristics of the acoustical panels shall consist of: textured surface, high density material to resist impact damage, non perforated tile with a textured finish. Acoustic tile ceiling shall conform to the Fort Carson Installation Design Guide standard.

Acoustical units shall have a NRC grade of 0.50 to 0.60 when tested in accordance with ASTM C423, a CAC (Ceiling Attenuation Class) range of 40-44 when tested in accordance with ASTM E1414, and LR of 0.75 to 0.80.

1.7.23 Painting, General

Information regarding painting shall be referenced to the Unified

Facilities Guide Specifications, SECTION 09900, PAINT AND COATINGS for design criteria and minimum quality requirements.

1.7.23.1 Surfaces to Receive Stain or Paint

A semi-gloss enamel paint shall be on all exposed wall surfaces to be painted, except mechanical, electrical and communication rooms. A semi-gloss enamel paint shall be used on all mechanical, electrical, communication, and janitor closet walls.

All gypsum wallboard ceilings shall receive a semi-gloss enamel paint finish.

Interior wood trim shall receive a stain and clear polyurethane finish.

Exposed masonry walls to be painted shall receive a latex filler coat, one coat of primer and two coats of semi-gloss paint. Concrete or masonry in unexposed locations shall receive a coat of latex filler, one coat of primer, and two coats of semi-gloss paint.

Steel roof deck, structural elements, handrails and balusters shall receive a semi-gloss paint finish.

1.7.23.2 Surfaces Not to be Painted

Surfaces in the following areas are not to be painted:

Concrete or concrete masonry units in unexposed areas.

Concrete floors - except where noted and under the raised floor system.

Metal surfaces of aluminum, stainless steel, chromium plate, bronze, copper and similar finish materials and all factory finished items.

Jacketing over pipe insulation in unexposed locations that do not require color coding.

Surfaces of hardware, fittings, sprinkler heads, fire protection equipment and other factory finished items not requiring a painted finish.

Glass, wall covering and other finish surfaces.

1.7.24 Metal Lockers (Personnel)

Metal lockers shall be standard lockers that are 15-inches wide x 15-inches deep x 7'-2" high. Lockers shall be prime, high grade Class I annealed, cold rolled steel free from surface imperfections. All fasteners shall be zinc plated. All lockers shall be preassembled with all joints welded. No bolts, screws, or rivets shall be used in the assembly of the locker bodies. Lockers shall have 16 gage bodies. Locker tops to be sloped. Lockers shall be provided with ventilation louvers in the doors. Doors shall be equipped with a device to receive a padlock. Metal shall be cleaned, rust inhibitive treated, and finished with a high quality enamel that is baked on. Accessories shall include hat shelves and coat hooks.

1.7.25 Exterior Signage

Information regarding exterior signage shall be referenced to the Unified

Facilities Guide Specifications, SECTION 10430, EXTERIOR SIGNAGE for design criteria and minimum quality requirements, and the requirements of the Installation Design Guide at Fort Carson.

Building number signage shall be cast aluminum material in a helvetica medium style, located at the building front entrance.
Building number signage shall be 8-inches tall, satin-finished brushed aluminum, and mounted at approximately 8'-8' above the finish floor. All signage shall be in accordance with the Fort Carson Installation Design Guide. Coordinate with the Department of Public Works at Fort Carson.

Door numbers signage shall be cast aluminum in a helvetica medium style, located above each door of the apparatus bay, centered over each overhead sectional door . Door number signage shall be 12-inches tall if satin-finished brushed aluminum, satin-finished brushed aluminum, centered above door. Coordinate with the Department of Public Works at Fort Carson.

1.7.26 Toilet Accessories

Information regarding toilet accessories shall be referenced to the Unified Facilities Guide Specifications, SECTION 10800, TOILET ACCESSORIES for design criteria and minimum quality requirements.

1.7.26.1 Accessory Types

Shelving for janitor closets shall be constructed using plastic laminate over plywood with wood support brackets, also a 18 gauge stainless steel, satin finish shelf integral 4 mop holder and 5 hook brackets shall be supplied.

Toilet partitions, and urinal screens shall be made of stainless steel . Toilet partitions shall be floor mounted with overhead bracing.

Paper Towel Dispenser / Waste Receptacle (PTDWR)shall be a fully recessed unit suppling multi-fold paper towels. The cabinet shall have a concealed tumbler key lock. Unit shall have a 10 gallon minimum removable molded plastic insert.

Electric hand dryers, see Section 01007.

Grab Bar (GB) shall have concealed mounting flange with set screw mounting holes concealed on the lip of the flange. Grab bars shall have a peeled non-slip surface.

Soap Dispenser (SD) shall be the liquid type pump type with a minimum 34 fluid ounce capacity. Dispenser shall be mounted on the lavatory fixture.

Mirror Glass(MG) mirrors shall be a minimum of 16-inches wide by 20-inches deep and shall be installed over each lavatory, see drawings for locations. A full length 20-inches X 6'-0" mirror shall be installed in each locker room, see drawings for location. Tilting type mirrors sized which meet American With Disabilities Act standards shall be installed in the handicapped toilets and over any handicapped lavatory. The west wall of Physical Fitness #171 shall have a floor to ceiling mirror installed on the west wall.

Toilet Tissue Dispenser (TTD) shall be a double roll dispenser with a recessed holder, integrated into the toilet partitions where applicable.

Sanitary Napkin Dispenser (SND) shall be wall mounted and mounted in Women's Toilet #160.

Sanitary Napkin Disposer (SND)shall be installed where indicated.

Soap Holder (SH) shall be tile and integral with shower tile.

Robe Hook (RH) shall be a double hook with a 4 inches wide stainless steel bar mounted horizontally that forms a hook at each end. Flange approximately size is 2-inches x 2-inches. Unit extends approximately 2-inches from the wall.

Shower enclosures shall be full height ceramic tile on concrete backer board with a terrazzo shower basin, and drain.

Shower doors shall be tempered swinging glass units with outswinging door hinges. Doors shall be equipped with standard handles and latches. Doors shall be completely water-tight units that will not corrode.

1.7.26.2 Toilet Accessory Finishes

Finishes shall match stainless steel, Type 304.

1.7.26.3 Miscellaneous Accessories

Shelf & Holder- a single mop broom holder with a metal self and bracket shall be provided in the Janitor Closets. Units shall be approximately 34"(w) x 16" (h) x 8" (d), fabricated of 18 gauge, Type 304 stainless steel with #4 satin finish. The unit shall have 4 metal hooks and 3 mop holders.

1.7.26.4 Toilet Accessories Requirements

Fire Chief's Toilet #126 shall have toilet accessories as follows:

1 Mirror (above counter)
1 Toilet Tissue Dispenser
1 Towel Bar
1 Robe Hook
1 Paper Towel Dispenser/ Waste Receptacle
1 Full Height Mirror
1 Glass Shower Door

dispatch/911 CenterToilet #110
1 Mirror (above counter)
1 Toilet Tissue Dispenser
1 Towel Bar
1 Robe Hook
1 Paper Towel Dispenser/ Waste Receptacle
1 Sanitary Napkin Disposer
1 Glass Shower Door

Public (Handicapped) Toilet #112
1 Tilted Handicapped Mirror
2 Grab Bars
1 Toilet Tissue Dispenser
1 Sanitary Napkin Disposer
1 Paper Towel Dispenser/ Waste Receptacle

Men's Showers/Lockers #156
3 Towel Bars
6 Robe Hooks
3 Glass Shower Doors
14 Personnel Lockers

Men's Sinks # 157
1 Large Mirror
2 Liquid Soap Holders
2 Paper Towel Dispensers/Waste Receptacles

Men's Toilet #158
3 2-Roll Toilet Tissue Dispensers
3 Robe Hooks (on toilet partition doors)

Janitor Closet #159
1 Floor Mop Sink
1 Shelf with Mop Holders

Women's Toilet #160
1 Large Mirror
1 Liquid Soap Dispensers
1 Paper Towel Dispenser/ Waste Receptacle
1 Sanitary Napkin Dispenser
1 Sanitary Napkin Disposer
1 2-Roll Toilet Tissue Dispensers
1 Robe Hooks (on toilet partition doors)
4 Personnel Lockers

Women's Shower #161
1 Towel Bars
2 Robe Hooks
1 Glass Shower Doors

1.7.27 Fire Extinguishers and Cabinets

Information regarding fire extinguishers and cabinets shall be referenced to the Unified Facilities Guide Specifications, SECTION 05500, for design criteria and minimum quality requirements. Furnish additionally a (5-pound) fire extinguishers (type meeting the code and hazard requirements of the space) sized to fit into the fire extinguisher cabinets selected.

Fire extinguisher cabinets shall be fully recessed type where wall construction allows or a semi-recessed type based on wall construction with a flat metal door. Fire extinguisher cabinets shall be sized for a future 10 pound fire extinguisher cabinet. Clear plastic bubble type door fronts are not acceptable. Each fire extinguisher cabinets shall hold a 5 lb type ABC extinguisher. The fire extinguisher cabinets shall be located in accordance with NFPA Life Safety Code #101, and NFPA #10. Fire extinguisher cabinets shall be brushed aluminum finished.

Fire extinguisher cabinets shall not be located on any walls designated with STC requirements.

1.7.28 Casework, Cabinets & Countertops

Information regarding cabinets and countertops shall be referenced to the Unified Facilities Guide Specifications, SECTION 12320, CABINETS AND COUNTERTOPS for design criteria and minimum quality requirements with additional requirements added to specifications to obtain commercial grade architectural woodwork, base and wall cabinets, and countertops. Solid surface countertops shall be provided for all countertops and shall be referenced to the Department of the Navy Guide Specifications, SECTION 06650 for design criteria and minimum quality requirements.

All cabinet construction shall meet the requirements of the National Kitchen Cabinet Association. Cabinets shall be provided where indicated on the drawings. Cabinets shall be standard, factory-manufactured products of modular kitchen cabinets suppliers or custom-built units. Frame type cabinets shall be supplied. Top and bottom corners shall be braced with either hardwood blocks that are glued together with water resistant glue and nailed in place, or metal or plastic corner braces. All cabinets shall be constructed of solid wood or five-ply plywood. The cabinet construction frame and doors shall meet minimum requirements set forth in ANSI/KCMA A161.1 for "high use" areas. Requirements for this organization may be found at www.kcma.org. The countertop shall be constructed of a minimum 3/4" particle board and covered with a solid surface material. All points of hardware attachment (e.g. screws, hinges) must be inserted into solid wood lumber. The finish of all exposed exterior cabinets, door surfaces shall be plastic laminate. All counter tops shall be solid polymer resin, such as Corian. The finish of the interior cabinets, shelving, and interior door surfaces shall be plastic laminate.

Doors- shall be finished with plastic laminate and shall be approximately 1/2-inch thick.

Drawers will have side guides with an automatic stop feature. Sides and bottom will be constructed of 3/8-inch thick hardwood or plywood. Drawer fronts shall be removable and replaceable. All drawers shall be dove-tail jointed.

Solid Surface Countertop- shall consist of solid polymer material composed of acrylic polymer, mineral fillers, and pigments. Countertops shall have a semi-gloss finish. Countertop material shall have a minimum 1/2 inch thickness and be continuously supported with particle board. Countertop material of 3/4 inch thickness shall not require continuous supported particle board material. Sinks shall have an under mount installation and all exposed countertop edges shall have a decorative grooved edge treatment. Backsplashes hall be a 1/4 inch thick solid surface material which matches the countertops.

Solid Surface Material Characteristics:
- color and pattern continuous all through the material,
- material shall not delaminate with age,
- installation joints shall be seamless in appearance,
- shall not be porous and resist stains,
- shall resist fractures, chipping and cracking,
  - have the ability to remove minor cuts and scratches with fine sand paper and restore it to the original condition,
- Class I flammability rating,
- vanity tops and bowls shall be fabricated in one unit (when possible),
- sinks with exposed lips and grout joints is considered unacceptable.

All exposed edges of the countertops shall be rounded.

Cabinet hardware finishes shall match stainless steel, Type 304. Door hardware shall be as follows:
door pulls- shall be similar to BHMA D1791,
door hinges- a minimum of two concealed hinges with each door (similar to BHMA B01501),
door latch- a magnetic door catch, similar to BHMA B03141 for each door,
mirrors- shall extend for top of backsplash to 7 ft.

1.7.28.1 Cabinet, Closets, Countertops, Vanity Requirements

A. Typical Dorm room Locker

Wood shelf at top of the unit (hat shelf)
Metal closet clothing bar similar to BHMA L03141
Wood bottom drawer
Lockable wood door concealed hinges

B. Typical Dorm room Writing Counter

Plastic laminate counter top
Solid casework box above with adjustable shelf
Under shelf task lighting above the work surface

C. Secretary/Receptionist Counter #103

Solid surface polymer writing surface and elevated countertop
Adjustable keyboard
Pencil drawer
Task lighting
Minimum of 2 pedestals
Transition counter
Handicapped Portion

D. Dorm room Closets

Wood shelf running the entire length of closet
Metal closet clothing bar similar to BHMA L03141

E. Wood Storage Cabinets

Wood veneer lockable doors with concealed hinges
Plastic laminated covered shelves (5 total) with 75 lb capacity each

F. Kitchen Cabinets, Room #175

Solid surface polymer countertop
Cabinet draws, cabinet doors, and overhead doors are to be aligned
Door shall be plastic laminate covered with concealed hinges
Overhead cabinets shall be 12-inches deep
Space above cabinets and ceiling shall be filled with gypsum board soffit
Backsplash and countertop shall be integral
Provide one door pull per cabinet door and drawer

Provide magnetic catch for each door
Contractor shall coordinate kitchen cabinet design with kitchen appliances
Each overhead cabinet shall have 2 adjustable shelves
Each under counter cabinet shall have one adjustable shelf
Cabinets shall be adjusted for under counter microwave unit

G. Kitchen Island Cabinets

Solid surface polymer countertop
Cabinet draws, cabinet doors are to be aligned
Door shall be plastic laminate covered with concealed hinges
Provide one door pull per cabinet door and drawer
Provide magnetic catch for each door
Contractor shall coordinate kitchen cabinet design with kitchen appliances
Each under counter cabinet shall have one adjustable shelf
Cabinets shall be adjusted for under counter microwave unit

H. Countertop Eating Area

Solid surface polymer countertop
Provide clear plastic protection plates to prevent scuffing of the casework. Protection plates shall run from floor to the underside of the countertop.

I. Laundry Counter, Room #163

Solid surface polymer countertop
Backsplash and countertop shall be integral
Countertop shall be without drawers or doors under the counter
All structural supports shall be concealed within the counter design
Counter shall be able to support 70 lbs

J. Toilets

Solid surface polymer countertop
Cabinets shall meet handicapped requirements where applicable
Backsplash and countertop shall be integral

1.7.29 Miscellaneous Equipment

1.7.29.1 Floor Mat and Frame

Information regarding floor mats and frames shall be referenced to the Unified Facilities Guide Specifications, SECTION 12675, RECESSED FLOOR MAT AND FRAME for design criteria and minimum quality requirements.

Entire floor mat and frame shall be fully recessed and flush with adjacent surfaces. The frame shall be constructed of aluminum extrusions and secured to the floor. The mat shall consist of carpet inserts with continuous interlocking treads which allows for easy roll-up. Floor mat size shall be approximately as shown on the drawings.

1.7.29.2 Marker Board

Marker board size shall be 6'-0" x 14'-0". Marker board writing surface shall be composed of porcelain enamel fused to nominal 28 gage thick steel.

A 2-inch oak perimeter frame shall be provided. Marker board shall be in accordance with Unified Facilities Guide Specification - Section 10100, Visual Communication Specialties

1.7.29.3 Raised Floor System

Information regarding floor panels shall be referenced to the Corps of Engineer Guide Specifications, SECTION 10270, RAISED FLOOR SYSTEM for design criteria and minimum quality requirements.

A. A raised floor system shall be provided in the Dispatch/911 Center as shown on the plans. The proposed floor panels shall require a pedestal and stringer support system.

B. Floor panels shall be capable of supporting 1500 pounds concentrated load without permanently deflecting per UFGS Guide specifications.

C. Floor panels shall be die-cast or extruded aluminum over a pedestal and stringer support system. Panel sizes shall be 2 foot width x 2 foot length. Finished surface of raised floor system shall be finished with floor surfacing materials to match adjacent floor surfaces. Floor finish shall be removable carpet tiles.

D. Flooring shall comply with conductive surfacing requirements.

PART 2 NOT USED

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SECTION 01004

INTERIOR DESIGN REQUIREMENTS

PART 1 INTERIOR DESIGN REQUIREMENTS

1.1 REFERENCES

The publications listed below shall be utilized for design of this facility to the extent referenced. The publications shall comply with the latest edition of the UFGS guide specification.

DESIGN CRITERIA

Fire Station Design Guide	(1998) Department of the Army Facilities Standardization Program http://hqserver.hnd.usace.army.mil/stddgn/Firestations
Installation Design Guide	(1989) Fort Carson Installation Design Guide

CODE OF FEDERAL REGULATIONS (CFR)

36 CFR 1191	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities

FEDERAL STANDARDS (FED-STD)

FED-STD 795	(Basic) Uniform Accessibility Standards

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 101	(2000) Life Safety Code

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

AATCC 134	Test Method: Electrostatic Propensity of Carpets

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 1335	Tuft Bind of Pile Floor Coverings Room Method
ASTM E 648	Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
ASTM E 84	Surface Burning Characteristics of Building Materials

ASTM F 793	Standard Classification of Wallcovering by Durability Characteristics
ASTM F 1066	Vinyl Composition Floor Tile
ASTM F 1344	Rubber Floor Tile

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A137.1	Ceramic Tile

CODE OF FEDERAL REGULATIONS (CFR)

16 CFR 1630	Standard for the Surface Flammability of Carpet and Rugs

FEDERAL SPECIFICATIONS (FS)

FS AA-V-00200	Venetian Blinds

1.2 DESIGN CRITERIA

The design of this building shall be in accordance with this document.

1.3 INTERIOR FINISHES

1.3.1 Carpet

Carpet tile and broadloom carpet shall be multi-colored for maximum soil-hiding properties and antistatic. Carpet tile shall be installed in rooms 105, 106, 107, 108 and 109. Remaining areas shall receive broadloom. Carpet shall be 100% continuous filament, solution dyed and/or yarn dyed, branded nylon with loop construction. Primary and secondary backing for carpet shall be synthetic. Preference should be given to products containing recovered material when possible. Carpet shall meet the following minimum requirements:

1.3.1.1 Pile Type

Pile type shall be loop with a minimum 1/8" gauge and minimum pile density of 4725. A minimum yarn weight of 28 ounces is recommended; coordinate lower ounce weight products with the Government.

1.3.1.2 Static Control

Static electricity build-up of the carpet shall be permanently less than 2.0 (carpet tile) and 3.5 (broadloom) kilovolts at 70 degrees F and 20 percent relative humidity as determined by the American Association of Textile Chemists and Colorists (AATCC 134 Test Method), Electrostatic Propensity of Carpets.

1.3.1.3 Flammability and Critical Radiant Flux Requirements

Carpet shall comply with 16 CFR 1630 and have a minimum average critical radiant flux of .45 watts per square centimeter when tested in accordance with ASTM E 648.

1.3.1.4 Tuft Bind

Tuft bind force required to pull a tuft or loop free from carpet backing shall be a minimum 20 pound average force for loop pile when tested in accordance with ASTM D 1335. A ten year warranty from the carpet manufacturer against edge ravel, delamination and tuft bind is required.

1.3.1.5 Installation

Broadloom carpet shall be installed direct glue down. Carpet tile shall be installed with release adhesive and shall be snugly jointed together. Tiles shall be laid in the same direction with accessibility to the subfloor where required. Adhesives and concrete primers shall be waterproof, nonflammable, meet local air-quality standards, and be as recommended by the carpet manufacturer.

1.3.2 Vinyl Composition Tile

Vinyl composition tile shall conform to ASTM F 1066, Class 2 (through pattern tile), Composition 1, asbestos-free. Tile shall have the color and pattern uniformly distributed throughout the thickness of the tile. Provide vinyl composition tile floor patterns in Entry 102 and Corridors 111 and 122. At least two different colors should be used to coordinate with the color scheme.

1.3.3 Fabric Wallcovering

Fabric wallcovering shall be a polyolefin woven fabric with paper or acrylic backing and shall be colorfast, stain, and soil resistant. The wallcovering shall have a Class A flame spread rating of 0-25 and smoke development rating of 0-50 when tested in accordance with ASTM E 84. In additiona, the wallcovering, adhesives and installation shall comply with UBC 42-2, UBC 8-2, or NFPA 265. Clear corner guards shall be provided for all outside corners. Provide wallcovering that is aesthetically pleasing and has some visual texture to simplify maintenance. Wallcovering shall not be solid in color.

1.3.4 Ceramic Tile

Ceramic tile shall conform to ANSI A137.1, moderate to heavy grade only. Porcelain tile flooring and trim shall be unglazed and unpolished with the color extending uniformly through the body of the tile, equal to Crossville Ceramics. Provide ceramic wall and/or porcelain floor tile pattern using several coordinating colors in the toilets as appropriate. The light color shall be the background color, and the dark colors shall be accents.

1.3.5 Interior Signage

Signage must conform to 36 CFR 1191 Americans with Disabilities Act (ADA) and FED-STD 795 Uniform Federal Accessibility Standards (UFAS), whichever is most stringent. Signage system shall match system which is currently the base standard. Provide signage for all rooms unless otherwise directed by the Contractaing Officer. Coordinate signage requirements and placement with user and Contracting Officer.

1.3.6 Horizontal Blinds

Horizontal blinds shall be provided on exterior windows and interior windows unless otherwise noted. Blinds shall be in accordance with FS AA-V-00200, Rev. B., Type II. Slats shall be aluminum and not less than .0070" thick .

1.3.7 Resilient Base

Base shall be 4 inches high and a minimum 1/8" thick. Job formed corners shall be furnished.

1.3.8 Installation of Finishes

All finishes shall be installed as per manufacturer's recommendations. Extra material shall be provided of all finishes in minimum quantities of 2% to 5% and coordinated with Contracting Officer.

1.4 INTERIOR COLOR, TEXTURE, AND PATTERN

The color, texture, and pattern selections for the finishes of the building shall provide an aesthetically pleasing, comfortable, easily maintainable and functional environment for the occupants. Color of ceramic tile and quarry tile grout shall be a medium range color to help hide soiling. Plastic laminates shall have patterns that are mottled, flecked or speckled with a mar-resistant finish such as Formica's "Crystal" finish. Solid surface material shall also have a pattern that is mottled, flecked or speckled, except for sinks and accent areas. Coordination of building colors, textures and finishes is necessary for a cohesive design.

1.5 EXTERIOR FINISHES

The exterior finishes and colors shall follow the Fort Carson Installation Design Guide.

1.6 FURNITURE

PART 2 NOT USED

PART 3 NOT USED

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SECTION 01005

STRUCTURAL REQUIREMENTS

PART 1 STRUCTURAL

1.1 PROJECT DESCRIPTION AND REQUIREMENTS

The Fire Station shall be constructed as indicated on the attached architectural drawings. The building shall be structurally designed and configured by the Design/Build Contractor in accordance with the criteria and other requirements stated herein.

1.2 DESIGN CRITERIA

The design publications listed below shall be used as sources of criteria for structural design. The criteria from these sources may be supplemented, but not supplanted, by applicable criteria contained in nationally recognized codes, standards, and specifications. (In all cases, later editions to the below listed documents may be used.)

1.2.1 Department of the Army Technical Manuals (AFM)

(These publications are available from the National Institute of Building Sciences Construction Criteria Base (CCB) on CD-ROM free of charge to the successful offeror. Some of these manuals may be available to download in Acrobat .pdf file format at the following internet address: http://www.hnd.usace.army.mil/techinfo.)

Army TM 5-809-3 Masonry Structural Design for Buildings (Oct 92)

Army TM 5-809-12 Concrete Floor Slabs on Grade Subjected to Heavy Loads

1.2.2 US Army Corps of Engineers Technical Instructions (TI)

(These publications are available at http://www.usace.army.mil/usace-docs, listed under "Engineer Instructions".)

TI 809-02 Structural Design Criteria for Buildings (Sep 99)

TI 809-04 Seismic Design for Buildings (Dec 98)

TI 809-07 Design of Cold-Formed Load Bearing Steel Systems and Masonry/Steel Stud Walls (Nov 98)

TI 809-29 Structural Considerations for Metal Roofing (Aug 98)

TI 809-52 Commentary on Snow Loads (Aug 98)

1.2.3 Unified Facilities Criteria (UFC)

UFC-310-01 Load Assumptions for Buildings (Jun 00)
UFC-010-01 DOD Minimum Antiterrorism Stands for Buildings

1.2.4 American Society of Civil Engineers (ASCE) Publication

ASCE 7-98 Minimum Design Loads for Buildings and Other Structures

1.2.5 American Concrete Institute Publications

ACI 318-02 Building Code Requirements for Structural Concrete and Commentary

ACI 530-92 Building Code Requirements for Masonry Structures and Commentary

1.2.6 American Institute of Steel Construction Publication

Specification for Structural Steel Buildings - Allowable Stress Design, Plastic Design (ASD) (June 1, 1989)

Load and Resistance Factor Design Specification for Structural Steel Buildings (LRFD) (December 1, 1993)

1.2.7 Federal Emergency Management Agency

(These publications can be obtained at no charge from:

FEMA Report Distribution Center
PO Box 2012
Jessup, MD 20794
Telephone: 800-480-2520; Fax: 301-497-6378)

FEMA 302 NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures : Part 1 - Provisions (February 1998)

FEMA 303 NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures : Part 2 - Commentary (February 1998)

1.2.8 Metal Building Manufacturer's Association (MBMA) Publication

Low Rise Building Systems Manual (1986)

1.2.9 Steel Deck Institute (SDI) Publications

Diaphragm Design Manual (2nd Edition, 1987)

Design Manual for Composite Decks, Form Decks and Roof Decks and Cellular Metal Floor Deck with Electrical Distribution (Pub No. 29)

1.2.10 Steel Joist Institute (SJI) Publications

Standard Specifications, Load Tables and Weight Tables for Steel Joists & Joist Girders (1994)

1.3 STRUCTURAL LOADING CRITERIA

Structural loading criteria shall be developed using the criteria sources and following the procedures indicated below. The Fire station shall be classified as an Occupancy Category IV facility, in accordance with ASCE 7-98, for the purpose of calculating of wind and snow loads. The FireStation shall be classified as a Seismic Use Group III E facility, in accordance with TM 809-04, for the purpose of calculating seismic loads. The mandatory DoD minimum antiterrorism standards for buildings in accordance with UFC-010-01 shall be incorporated into the design.

1.3.1 Roof Live Loads

1.3.1.1 Snow Load

Roof snow load, including additional loading due to snow drifting where appropriate, shall be calculated and applied in accordance with ASCE 7-98 and Army Corps of Engineers TI 809-52, using a ground snow load of 15 psf.

1.3.1.2 Rain Loads

Rain loads shall be considered in accordance with ASCE 7-98.

1.3.1.3 Minimum Roof Live Load

A minimum roof live load of 30 psf, applied in accordance with ASCE 7-98, shall be used as a loading condition for the roof, independent of the calculated snow load.

1.3.2 Floor Live Loads

1.3.2.1 Uniform Floor Loads

Floor slabs in various areas of the building shall be designed to support the following minimum uniformly distributed floor live loads:

AREA	LIVE LOAD (psf)
Apparatus Room	250
Storage and Maintenance Areas	150
Offices	50
Living Quarters	40
Corridors and Lobby	100
Locker Room	100
Fitness & Recreation Rooms	100
Alarm & Communications Rooms	150
Mechanical/Electrical Rooms	150
Mezzanines	80
Stairs	100
All Other Areas	100

Stair treads and landings shall be designed to support an independent alternative live loading condition of 300 lbs on an area of 4 square inches.

1.3.2.2 Vehicular Floor Live Loads

The floor slab of the Apparatus Room shall be designed for vehicle loading, separate and mutually exclusive of the above uniform loading, as follows:

Truck Loading	Total Weight (Loaded)		62,000 lbs
	Axle Loads:	Front	18,000 lbs
		Mid	22,000 lbs
		Rear	22,000 lbs

Additonal vehicle information can be obtained from the Fort Carson Fire Department.

1.3.3 Wind Loads

Wind loads shall be calculated in accordance with the procedures outlined in ASCE 7-98 using Exposure "C" and a Basic Wind Speed (3-Second Gust Speed) of 90 mph. Wind loads for both the main wind-force resisting system and for components and cladding shall be considered.

1.3.4 Seismic Loads

The Fire Station shall be designed to withstand seismic loading in accordance with Army Corps of Engineers TI 809-04, FEMA-302, and FEMA-303. Seismic Parameters for Fort Carson are as follows:

Fort Carson has a spectral response acceleration for short periods (0.2 second) of 0.17g, and a 1.0 second spectral response of 0.06g. These values were derived using guidance from the U.S. Army Corps of Engineers Technical Instructions "Seismic Design for Buildings" TI 809-04, dated 31 December 1998, and the Federal Emergency Management Agency (FEMA) publication "NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures, 1997 Edition". Both accelerations were interpolated from 1:5,000,000 scale maps prepared by the U.S. Geologic Survey (USGS), Building Seismic Safety Council (BSSC), and FEMA for 0.2 Sec. Spectral Response Acceleration (5% of Critical Damping), Site Class B, and 1.0 Sec. Spectral Response Acceleration (5% Critical Damping), Site Class B, respectively. The spectral response accelerations taken from these maps must be adjusted for site class effects using coefficients provided in the aforementioned guidance. For design purposes, the reference site condition is taken as National Earthquake Hazards Reduction Program (NEHRP) site class D.

The adjusted maximum considered earthquake spectral response acceleration parameters are:

The Short-Period Spectral Acceleration (SMS = FaSs) for site class D is (1.6 x 0.17) 0.272.

The 1-Second Period Spectral Acceleration (SM1 = FvS1) for site class D is (2.4 x 0.06) 0.144.

Seismic Design Category = C.

1.3.5 Dead Loads

Minimum design dead loads for common building materials shall be obtained from ASCE 7-98. Equipment loads and loads for materials not listed in that publication can be obtained from other recognized sources.

1.3.6 Lateral Partition Loads

The minimum design wind pressure on interior partitions shall be 10 psf normal to the partition.

1.3.7 Design Temperatures

Design differential temperatures shall be a minimum 100 degrees F for thermal analysis of framing systems.

1.3.8 Deflections

Roof and floor members and walls shall be designed to have deflections limited to the following maximums.

1.3.8.1 Floors

The deflection due to live load of structural members supporting floors shall not exceed 1/360 of the span.

1.3.8.2 Roofs

The deflection of structural members supporting roofs due to live, wind, or snow loadings shall not exceed 1/360 of the member span where plaster or other brittle ceiling materials are attached or suspeneded, and shall not exceed 1/240 of the member span where non-brittle ceiling materials are suspended

1.3.8.3 Partitions

The lateral deflection of interior partitions due to internal wind pressures shall not exceed 1/360 of the partition span.

1.4 STRUCTURAL MATERIALS

Materials for structural elements shall be as indicated herein or on the attached architectural drawings. Where materials are not indicated, selection shall be at the Contractor's discretion, with the following limitations. Wood products are not acceptable for use as structural elements.

1.4.1 Structural Steel

1.4.1.1 Design

Structural steel shall be designed in accordance with AISC Specification for Structural Steel Buildings - ASD or LRFD. All structural steel members shall be designed by the structural engineer to support all applicable loads. Structural drawings shall clearly show all structural members, connections and their locations.

1.4.1.2 Connections

Types of connections shall be consistent with the design assumptions for the basic type of steel construction used. Connections shall be designed and detailed to provide adequate capacities for the applied forces and moments. Connection design shall be the responsibility of the structural engineer and shall not be delegated to the steel fabricator.

1.4.2 Steel Joists and Joist Girders

The design and selection of steel joists and joist girders shall be governed by the Steel Joist Institute (SJI) Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders. The net wind uplift requirements shall be clearly delineated on the drawings. Joists requiring special configurations or design to resist wind uplift and non-uniform loads shall be designated as such on the drawings and the required design loads indicated, per SJI recommendations. Joist end supports and anchorage to resist uplift shall be designed to accommodate the applied forces, including those resulting from wind and seismic activity.

1.4.3 Steel Decking

The design and selection of steel deck shall be in accordance with the provisions of the Steel Deck Institute (SDI) Design Manual. Minimum required section properties of deck sections shall be determined as prescribed by the appropriate Specifications of the SDI Design Manual, and shall be specified or indicated on the drawings. Where the steel deck is designed to function as a shear diaphragm, the design shall be in accordance with the provisions of the Steel Deck Institute (SDI) Diaphragm Design Manual and Army Corps of Engineers TI 809-04.

1.4.4 Masonry

1.4.4.1 Design

Masonry design shall be in accordance with ACI 530-92, TM 5-809-3, and Army Corps of Engineers TI 809-04. Reinforcement shall be sufficient to satisfy the calculated requirements for strength, shrinkage crack control, and seismic design. In no case shall reinforcement be less than the minimum seismic reinforcement required by TI 809-04. If masonry walls are used in conjunction with steel framing as non-load-bearing and non-shear-resisting elements, the connections between walls and the structural steel frames must be designed to allow vertical and horizontal frame deflection without transferring loads from steel to adjoining masonry walls.

1.4.4.2 Masonry Material Properties

Hollow concrete masonry units shall conform to ASTM C90, Type I. Concrete building bricks shall conform to ASTM C55, Type I. Masonry units for use as exterior facing shall conform to Grade N. Type S mortar shall be specified for all masonry. Specified compressive strength of grout shall be 2000 psi minimum. Masonry exposed directly to the ground or weather shall be rated for severe exposure conditions. Facing brick shall conform to ASTM C 216, Type FBS. Brick exposed directly to the ground or weather shall be grade SW, other brick may be SW or MW at contractor option.

1.4.4.3 Crack Control

Concrete masonry crack control measures comprised of masonry control joints, joint reinforcement, and bond beams shall be incorporated in the design of concrete masonry walls and partitions. Masonry Control Joints (MCJ) shall be judiciously located at spacings no greater than the maximums recommended in TM 5-809-3. Control joints shall not be placed closer than 600mm to openings.

1.4.4.4 Sound Attenuation

Exterior concrete masonry walls, where indicated in Section 01003 ARCHITECTURAL REQUIREMENTS, shall have ungrouted unit cells filled with fine granular material. Material shall be as indicated in Section 01003 ARCHITECTURAL REQUIREMENTS.

1.4.5 Reinforced Concrete

1.4.5.1 Design

Reinforced concrete design shall be in accordance with ACI 318 and related current ACI publications which are applicable to the design, TM 5-089-12, and Army Corps of Engineers TI 809-02 and TI 809-04, as applicable. All concrete elements, including slabs-on-grade, shall be reinforced with temperature and shrinkage reinforcement as a minimum. Temperature reinforcement shall be as recommended by ACI 318 and TI 809-02, as appropriate.

1.4.5.2 Concrete Strength

The required 28-day compressive strength of the concrete shall be left to the Contractor's discretion, except that 3000 psi shall be a minimum. For concrete that is to be installed with exterior exposure, air-entrainment, producing a total air content in the concrete between 4 and 7 percent by volume, shall be required. Concrete in contact with soil shall be made with low alkali Type I or Type II cement.

1.4.5.3 Reinforcing Bar Usage Limitations

Grade 60 bars shall be used for concrete design.

1.4.5.4 Concrete Joints

Control joints and contraction joints shall be located to reduce concrete cracking to a minimum. All exposed concrete joints shall be sealed with appropriate joint sealants.

1.4.6 Precast Concrete

1.4.6.1 Design

The design shall conform with the requirements of ACI 318, Chp 16 - Precast Concrete. The precast units shall be designed for all applicable loads indicated in paragraph STRUCTURAL LOADING CRITERIA and the design shall consider all loading and restraint conditions from initial fabrication to completion of the structure. Flexural members shall be designed to support full live load acting in combination with full dead load, plus concentrated loads from any mechanical equipment actually furnished. The effects of initial and long-time deflections, as well as transporting the units, shall be considered in the design of precast members. Attachment of precast units shall be by welding, bolting, embedment of bars, or other connection devices, at the Contractor's option.

1.4.6.2 Precast Concrete Strengths

The required 28-day compressive strength of precast concrete shall be left to the Contractor's discretion, except that 5000 psi shall be a minimum. For any precast units that are to be installed with exterior exposure, air-entrained concrete, with a total air content between 4 and 7 percent by

volume, shall be required.

1.5 STRUCTURAL FRAMING SYSTEMS

The structural systems used for the Fire Station shall be selected and designed by the Contractor. The lateral load resisting system shall incorporate bracing, moment resisting frames, shear walls, diaphragms, or any combination thereof, provided the elements of the system are compatible with the attached architectural floor plan. Pre-engineered metal building systems are acceptable for the structural framing system. Cold-formed light-gage metal framing (i.e., steel studs) systems are not acceptable as gravity load-bearing systems. The structural framing system chosen shall meet all aforementioned project requirements and the requirements listed below.

1.5.1 Apparatus Room Clear Height Requirements

The clear height in the Apparatus Room from the bottom of structural roof framing members to the top of the finished floor shall be not less than 18 feet.

1.5.2 Roof Framing

The roof structure of the building shall slope as indicated on attached architectural drawings. The roof slope shall be accomplished by sloping of the structural framing members. The design of roof framing members shall include consideration of any concentrated loads from suspended mechanical and electrical equipment, including cable trays, piping and HVAC units. The location and magnitude of suspended equipment loads shall be closely coordinated with the mechanical and electrical system designs.

1.5.3 Location of Structural Elements

Structural elements, including columns, bracing, shear walls and load-bearing walls shall be located as required by the structural design. The structural design and corresponding selection and location of structural elements shall be compatible with the floor plan, roof plan, elevations and other architectural drawings included in the attachments to this document. Columns shall be located adjacent to walls where possible, and in such a manner that doorways or other accessways are not obstructed. Free standing isolated columns should be minimized. As indicated on the architectural drawings, isolated interior columns are not permitted in the Apparatus Room. Use of structural bracing shall be minimized, and shall be limited to locations where bracing is concealable at interior or exterior wall lines and does not obstruct windows, doors or other openings. Shear walls, where used, shall be located in coordination with architectural partition requirements.

1.5.4 Pre-Engineered Metal Building Framing Systems

Design of the structural framing of the building, if accomplished by pre-engineered metal building manufacturer, shall be in accordance with MBMA Recommended Design Practices Manual. Column locations and framing configurations shall conform to the Architectural floor plans included in the attachments to this document. Framing shall be isolated from masonry walls where possible, to allow for vertical and horizontal deflection of the framing system without cracking or unintentional loading of the masonry. Where masonry cannot by isolated, pre-engineered framing shall be designed to limit deflection to levels which will prevent damage to the

masonry. Framing induced lateral deflection of masonry walls shall not exceed 0.004 times the height of the masonry.

1.6 EXTERIOR/INTERIOR WALLS

Criteria indicated in Section 01003 ARCHITECTURAL REQUIREMENTS shall be incorporated into the design of all walls. The Architectural floor plans included in the attachments to this document indicate the location of walls to be incorporated into the project.

1.6.1 Non-Load-Bearing Walls

Non-load-bearing walls shall be shall be laterally braced by the overhead roof or floor structure, as appropriate, but shall be connected in a manner which provides for vertical deflection of the structure without inducing vertical loads into the wall.

1.6.2 Shear Walls

Shear walls, where used, shall be constructed of reinforced concrete masonry units. Shear walls shall be designed in accordance with ACI 318, ACI 530, TM 5-089-12, and Army Corps of Engineers TI 809-04.

1.7 FOUNDATION SYSTEMS

Design of foundation components shall be in accordance with the direction provided in the Final Foundation Anaysis, (Attachement No. 1). The components of the foundation system shall be constructed of reinforced concrete. The required 28-day compressive strength of concrete for the foundations shall be left to the Contractor's discretion, except that 3000 psi shall be a minimum. All parts of the foundation system shall be designed to keep dead load footing pressures relatively uniform, in order to minimize differential settlements.

1.7.1 Earthwork

Earthwork shall conform to the requirements set forth in Technical Specification 02315 EXCAVATION, FILLING AND BACKFILLING FOR BUILDINGS and to requirements stated in the Preliminary Soils Information Report (Attachment No. 1).

1.7.2 Foundation Systems

Two foundation systems used may be used for this project, conventional spread footings bearing on a layer of compacted engineered fill, or drilled piers bearing on the underlying shale bedrock. Which system is used shall be determined by the Contractor. See Final Foundation Analysis (Attachment No. 1) for specific requirements for each system.

1.7.3 Foundation Perimeter Insulation

Perimeter insulation shall be installed on the interior face of all exterior perimeter foundation walls. Insulation shall extend from the bottom of the floor slab down to top of footing or down to design frost depth.

1.7.4 Structural Stoops at Exterior Doorways

All exterior pedestrian doorways require structural stoops. Stoops shall have foundation walls extending down to frost depth and shall be rigidly attached to building foundation walls. Stoops shall have a 12 inch layer of uncompacted fill placed directly beneath the stoop slab. The stoop slab shall be flush with the interior floor slab at the threshold and shall slope away from the building at 2% minimum slope.

1.8 CONCRETE FLOOR SLABS-ON-GRADE

Design of slabs shall be in accordance with TI 809-02, TM 5-089-12, and the following detailed instructions:

1.8.1 General

Slabs shall be designed as either structurally-supported elements if a drilled pier foundation system is used and a cost analysis indicates that structurally-supported floors are adventageous, or as "floating slabs" without rigid edge support, and with lateral and vertical movement unrestrained, except where noted below. Refer to the Final Foundation Analysis for specific requirements for slab-on-grade (i.e. "floating slab") floors. Where compressible filler is used as a cushion, its thickness shall be not less than 2 inches. An isolation joint, consisting of a 1/2 inch layer of expansion joint material, is required where slabs abut vertical surfaces. Slab thicknesses shall be selected in accordance with TI 809-02, or as required by design. Slabs shall be reinforced with a minimum of 0.15 percent steel based on cross sectional area. Crack control measures shall be incorporated in the slab design. Control joint details and spacings shall be as delineated in TI 809-02. The required 28-day compressive strength of concrete for slabs shall be left to the Contractor's discretion, except that 3000 psi shall be a minimum.

1.8.2 Interior Concrete Slabs-on-Grade

Interior slabs-on-grade shall be placed over a a 20 mil unreinforced geomembrane vapor barrier, an 80 oz/square yard non-woven geotextile, and a capillary water barrier material not less than 6 inch compacted thickness. The vapor barrier shall be placed directly upon the subgrade material and then covered with the geotextile. Capillary water barrier will be placed over the geotextile. All slab crack control joints, construction joints, isolation joints between edges of slabs and vertical surfaces, and any mechanical, plumbing or electrical penetrations through the floor slab shall be sealed with a flowable polyurethane caulk.

1.8.2.1 Capillary Water Barrier and Sand Material

Capillary Water Barrier material shall consist of clean, crushed, nonporous rock, crushed gravel, or uncrushed gravel. The maximum particle size shall be 1 1/8 inch and no more than 2 percent by weight shall pass the No. 4 sieve. The capillary water barrier shall be placed in a minimum of 2 lifts, each compacted by a hand operated, vibratory compactor. Sand will be used to fill voids in the top surface of the capillary water barrier to provide an even surface for placement of the slab.

1.8.3 Slabs to Receive Quarry Tile, Ceramic Tile or Floor Mat Finish

Slabs to receive finishes requiring an inset grout bed or frame shall be 5 inches uniform in thickness, and shall be reinforced with #5 bars at 12 inches o.c. each way. Slabs shall be depressed as necessary to receive the

ceramic tile or the floor mat and frame. At interior edge locations, the slab shall be thickened and doweled into the adjacent slab with 3/4 inch diameter x 16 inchlong dowels at 12 inches o.c.. At locations where the slab abuts an exterior foundation wall, it shall be supported by the wall.

1.8.4 Concrete Floor Slab Finishes

Exposed concrete floor slabs in the Apparatus Room, Fire Fighting Agent Storage Room, Protective Clothing Laundry Room, Disinfection Room, Vehicle Maintenance Room, SCBA Maintenance Room, and the Fire Extinguisher Maintenance Room shall be given a non-skid, fuel impervious surface treatment. Surface treatment shall be as indicated in Section 01003 ARCHITECTURAL REQUIREMENTS. Slab finishes in other portions of the building shall be left to the discretion of the contractor, subject to the approval of the Contracting Officer.

1.8.5 Interior Equipment Pads

Floor mounted mechanical and electrical equipment shall be installed on 6 iinch thick raised concrete housekeeping pads. The pads shall be reinforced with at least the minimum temperature reinforcement required. The pads shall be sized 6 inches larger all around than the piece of equipment furnished and all edges of the pad shall be chamfered.

1.8.6 Equipment Vibration Isolation

All vibration producing mechanical and electrical equipment shall be mounted in such a manner as to prevent the transfer of vibrations to adjacent parts or areas of the building. If necessary for any large vibration producing equipment installed within the facility, the equipment will be supported on individual isolated foundations. The isolated foundation shall be separated from the building slab by a continuous 1/2 inch expansion joint.

1.9 OTHER STRUCTURAL WORK

1.9.1 Standing Seam Metal Roof System

Standing seam metal roof shall comply with the requirements set forth in Technical Specification \=07416=\ STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM. Final drawings shall provide a list of loading criteria, including roof live and wind uplift loads. A wind uplift diagram shall be used to identify wind uplift pressures and their locations on the roof.

1.9.2 Exterior Equipment Pads

Any exterior mechanical or electrical equipment shall be installed on concrete pads. The pads shall be a minimum of 8 inches thick and shall be reinforced with at least the minimum temperature reinforcement required. The pads shall be sized 6 inches larger all around than the piece of equipment furnished and all edges of the pad shall be chamfered. Design of exterior pads shall be coordinated with Mechanical and Electrical system designs.

1.9.3 Exterior Screen Walls

Exterior screen walls for the purpose of concealing equipment shall be constructed of reinforced brick masonry or reinforced concrete masonry with brick facing, with appearance to match the exterior of the Fire Station

building. See Section 01002 SITE WORK. Screen wall footings shall extend below frost depth.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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SECTION 01006

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PART 3 NOT USED

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SECTION 01006

MECHANICAL REQUIREMENTS

Prepared by: GDR
Reviewed by: xxx
Submitted by: IWO

PART 1 MECHANICAL REQUIREMENTS

1.1 MECHANICAL SYSTEMS CRITERIA

1.1.1 General Parameters/References

Mechanical systems, including HVAC systems, plumbing, gas distribution and building temperature controls shall be designed to comply with this section and the documents listed below to the extent referenced in this section. The publications are referred to in the text by basic designation only. The most current edition shall be used, whenever a specific edition is not mentioned. The most recently published of the date shown on the cover page/advertisement date shall be used. System design allowed for the Contractors selection shall be based on the combined factors of first cost considerations and related first cost (initial/construction) limitations using the criteria listed hereafter and acceptable analytic computer systems later in this section of the Request for Proposal (RFP):

Air Force Manual (AFM) 88-36, Energy Monitoring and Control Systems EMCS).

American Conference of Government Industrial Hygienists (ACGIH Industrial Ventilation: A manual of Recommended Practice current edition

American Society for Testing and Materials (ASTM) International publications - A53, B19.1, B19.3, Boiler and Pressure Vessel Code Section VIII.

American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE): The latest edition of the following standards and codes in effect and amended as of date of supplier's proposal, and any subsections thereof as applicable, shall govern design and selection of equipment and material supplied:

Terminology of HVAC&R, Second Edition
Guideline 1, The HVAC Commissioning Process
Guideline 3, Reducing Emission of CFC Refrigerants in Refrigeration
Guideline 12, Minimizing the Risk of Legonellosis Associated with Building Water Systems
Guideline 13, Specifying Direct Digital Control (DDC) Systems

Handbooks:

2003 HVAC Applications

2002 Refrigeration
2001 Fundamentals
2000 HVAC Systems & Equipment
1999 HVAC Applications
1998 Refrigeration
1999 HVAC Applications
1998 Refrigeration
1997 Fundamentals
1996 HVAC Systems & Equipment
1995 HVAC Applications
1994 Refrigeration
1993 Fundamentals
1992 HVAC Systems & Equipment
1991 HVAC Applications

Practices:

ASHRAE Terminology of HVAC&R, 2nd Edition, 1991;
Pocket Guide for Air-Conditioning.

Standards;

15-1994, Safety Code for Mechanical Refrigeration

55a-1995 Thermal Environmental Conditions for Principles of Heating, Ventilating and Air-Conditioning

62-1999 Ventilation for Acceptable Indoor Air Quality

90.1-2001 Energy Standard for Buildings Except Low-Rise Residential Buildings (IESNA COSPONORED) (ANSI COSPONORED); 1999 version w/12 amendments

52.1-1992 Gravimetric and Duct Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter

52.2-1999 Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size

129-1997 Measuring Air-Change Effectiveness.

American Society of Mechanical Engineers (ASME)International, 22 Law Drive, P.O. box 2900, Fairfield, N.J. 07007-2900, A17.1 Safety Code for Elevators & Escalators, ASME, 1996; B36.10, 61; section 8 & 9, Z83.6.

Army Technical Instructions TI 809-04 Seismic Design for Buildings, dated December 1998.

Air Force Engineering Technical Letter (ETL) 94-2 Utility Meters in New and Renovated Facilities

Engineering Technical Letters (ETL) 94-4 Energy Usage Criteria for Facilities in the Military Construction Program.

Air Force Engineering Technical Letter (ETL) 00-5 Seismic Design for Buildings and Other Structures

DRAFT Department of Defense Antiterrorism Construction Standards, XX ,

2001

Engineering Technical Letters (ETL) ETL 1110-3-483, Engineering Design Clothes Dryer Exhaust Venting

Energy Policy Act of 1992 (Public Law 102-486).

Executive Order 12902, Energy Efficiency and Water Conservation at Federal Facilities, dated March 8, 1994.

Executive Order 13123, Greening the Government Through Efficient Energy Management dated 3 June 1999.

Gas Institute Compressed Air (GACI)-Compressed Air and Gas Handbook current edition

Instrument Society of America Standard (ISA S75.01).

National Fire Codes (NFPA):

13 Installation of Sprinkler systems
54 National Fuel Gas Code
72 National Fire Alarm Code
90A Installation of Air Conditioning and Ventilating Systems
90B Installation of Warm Air Heating and Air Conditioning Systems
96 Ventilation Control and Fire Protection of Commercial Cooking Operations
211 Chimneys, fireplaces, Vents and solid Fuel Burning Appliances

National Fuel Code, 1999.

National Electrical Safety Code, IEEE, 1997.

International Sanitation Foundation (NSF)

SMACNA - HVAC Systems - Duct Design, 1990.

SMACNA -HVAC Duct Construction Standard - Method and Flexible, 2nd Edition1998.

Title 10 CFR, Part 435, Subpart A, pages 4535-4720 inclusive, Energy Conservation Voluntary Performance Standards for New Commercial and Multi-family High Rise Residential Buildings, Mandatory For New Federal Buildings Published January 30, 1989.

Title 10 CFR Part 436 Federal Energy Management and Planning Programs, Life Cycle Cost Methodology and Procedures, January 25, 1990.

Underwriters Laboratories (UL 142),(UL 441).

International Plumbing Code, 2000

US Green Building Council's Leadership in Energy & Environmental Design (LEED) http://www.usgbc.org/

WinLCCID - Life Cycle Cost in Design for Windows from USACERL (Support available @ (217) 333-3977

American National Standards Institute (ANSI) publications - 61;

section 8 & 9.

1.2 GENERAL REQUIREMENTS

The mechanical design shall consist of heating, ventilating, and air-conditioning, gas distribution, HVAC controls, food service and plumbing. Drawings, specifications, design analysis and calculations shall be provided for both the 60 percent design and Final design submittals, and shall be in accordance with SECTION 01336 - 60 PERCENT DESIGN REQUIREMENTS, & SECTION 01338 - 100 PERCENT DESIGN REQUIREMENTS.

a. This chapter contains instructions and engineering requirements for the mechanical design of the following:

- Equipment Identification and Abbreviations.
- Identification of Piping.
- Seismic Protection for Mechanical Piping and Equipment.
- Thermal Insulation of Mechanical Systems.
- Plumbing Systems.
- Exterior Gas Distribution Systems.
- Interior Gas Piping Systems.
- Hydronic Heating Systems.
- Heating, Ventilating, and Air-conditioning Systems.
- Chilled Water Systems.
- Building Temperature Control Systems.
- Testing, Adjusting, and Balancing of HVAC Systems.
- Technical Specifications.
- Energy Use Budget (EUB) Compliance Check.
- Training.
- Testing.
- Commissioning of HVAC.
- Food Service Equipment
- Emergency Generator
- LIFE CYCLE COST ANALYSIS (LCAA)

b. Provide new mechanical systems, complete and ready for operation. The design and installation of all mechanical systems, including manufacturer's products, shall meet the instructions and requirements contained herein and the requirements of the provided technical guide specifications. Where conflicts between these instructions and the guide specifications or criteria exist, these instructions shall take precedence. Any installation requirements within these instructions, but not contained in the specifications, shall be added to the specifications or shown on the drawings. For minimum specification requirements see paragraph TECHNICAL SPECIFICATIONS.

c. Mechanical designs shall give maximum consideration to the comfort of the occupants. The design shall also be economical, maintainable, energy conservative and shall take into account the functional requirements and planned life of the facility. Mechanical designs shall also consider life cycle operability, maintenance and repair of the facility and real property installed equipment components and systems. Ease of access to components and systems in accordance with industry standards and safe working practices is a design requirement. All like equipment and accessories shall be from a single manufacturer.

d. Standard Products - Material and equipment shall be a standard product of a manufacturer regularly engaged in the manufacture of the product and

shall be essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. The label or listing of the Underwriters Laboratories, Inc., will be accepted as evidence that the materials or equipment conform to the applicable standards of that agency. In lieu of this label or listing, a statement from a nationally recognized, adequately equipped testing agency indicating that the items have been tested in accordance with required procedures and that the materials and equipment comply with all contract requirements will be accepted.

e. Calculations shall be provided for all mechanical equipment such as boilers, air handling units, infrared heaters, heating & cooling coils, condensing units, dry coolers, unit heaters, piping, pumps, expansion tanks, supply/exhaust fans, ducts, louvers, penthouses, gas service and gas piping, plumbing, water heaters, re-circulating pump(s)and etc. Heating and cooling calculations may be provided by computer analysis i.e., Elite Software Inc., Trane Trace Load 700, Carrier E20-II Hourly Analysis Program (HAP) version 3.04 loads program etc.. Heat Loss calculation shall use actual design U-values. Add piping losses allowance of 15 percent. Design Energy Usage shall meet or be below Energy Use Budget target by ten percent (see paragraph ENERGY USE BUDGET (EUB) COMPLIANCE CHECK).

f. The existing facility's SCBA air compressor shall be relocated to the new Fire/Crash Rescue Station see paragraph GOVERNMENT-FURNISHED CONTRACTOR-INSTALLED (GFCI) SCBA COMPRESSOR SYSTEM.

g. Design Energy Usage shall meet or be below Energy Use Budget target by ten percent (see paragraph ENERGY USE BUDGET (EUB) COMPLIANCE CHECK). This shall be accomplished by increasing glazing, roof or wall insulation as necessary but, it shall not be below the level required by section 01003 ARCHITECTURAL BUILDING REQUIREMENTS. Also, develop and use building modeling and analysis techniques to establish a base case that meets the minimum prerequisite standard ASHRAE/ISNA 90.1. Then compare the baseline design energy cost budget for regulated energy components described in the requirements of ASHRAE/ISNA Standard 90.1 as demonstrated by a whole building simulation using the Energy Cost Budget Method described in Section 11 of that document, with the actual energy COST budget for this project in percentile. Regulated energy components include HVAC systems, building envelope, service hot water systems, lighting and other regulated systems, defined by the standard. Identify the percentile the actual design energy cost budget is above or below the baseline case in the design analysis.

h. "Green Buildings Technology": Mechanical equipment shall be energy efficient per Executive Order 13123 and ASHRAE/ISNA 90.1. Where products are not yet rated as energy efficient products by ENERGY STAR (Registered Trademark) the Contractor should strive to provide products that meet the above criteria and be in the upper 25 percent of energy efficiency as designated by FEMP. See other, paragraphs for other "Whole Building Design" minimum requirements.

1.2.1 Facility Descriptions

a. Fire fighters assigned to this station sleep, work, train, workout, study, recreate, cook, eat, and attend formations at this facility.

b. The facility shall be occupied (24) hours per day, (7) days per week. Mechanical rooms, stairs, exterior vestibules, janitor's closets, and storage shall be assumed as unoccupied. Backup boilers, hot water pumps and chilled water pumps shall be provided . The following areas/rooms shall

be provided with the equipment indicated.

1. Not Used.
2. Not Used.
3. Not Used.

4. Unit Heaters and Exhaust Fans:

Fire Gear Cleaning room	1
Disinfection/Decon	1
Breathing Apparatus room	1
Wet Fire Extinguisher	1
Dry Chemical Fire Extinguisher	1
Mechanical Room	1
Mechanical/Electrical	1
Mechanical/Generator	1
Mezzanine Storage	1
Mezzanine Void Area	1

5. Infrared Heaters:

Apparatus Room	1

6. Suspended Ceiling Cabinet Heaters:

At the end of all corridors:
main entrance vestibule
near exterior exits and alcoves

1.2.2 Not Used

1.2.3 Design Conditions

The following conditions shall be used in designing the mechanical systems:

1. Site Elevation:
Equipment design elevation is 5840 feet above mean sea level. Appropriate corrections shall be made when calculating the capacity of all mechanical equipment installed at this elevation.

a. Latitude: 38 Deg N
b. Heating Degree Days: 6,373

2. Outside Design Conditions:

Winter: -2 Deg F. for outside makeup air and infiltration
3 Deg F for transmission loads.

Summer: 89 Deg F DB; 58 Deg F MCWB for building loads.
95 Deg F air cooled equipment.

3. Inside Design Conditions:

Winter: 45 Deg F for Mechanical equipment areas, and vestibules.

70 Deg F @ 35% RH for Administrative areas including Conference, fire inspector's suite, corridors, private offices, Communication/radio communication rooms, Electrical/UPS room, Kitchen, dorms, day room, library/crew meeting room, break room, dining room, etc. (positive pressurization); restrooms/lockers, toilets (negative pressurization).

40 Deg F Apparatus bays (negative pressurization) and areas requiring unit heaters

Summer: 75 Deg F @ 35% RH for administrative areas including Conference room, corridors, private offices, Communication/radio communication rooms, Electrical/UPS room, Kitchen, dorms, day room, library/crew meeting room, break room, etc. (positive pressurization); restrooms/lockers, toilets (negative pressurization)

100 Deg F for mechanical/generator room and mechanical/electrical but, not less than minimum ventilation requirements

100 Deg F Apparatus Bays and areas requiring unit heaters but, not less than minimum ventilation requirements

72 Deg F maximum in Communication/radio communication rooms, and Electrical/UPS room,

4. Minimum Ventilation Requirements:

Apparatus Room (Vehicle Bays)1.5 cfm per square feet supply
General 20 cfm supply of outside air per person.
Private Toilets 50 cfm per Urinal/water closet (negative pressure)
Janitor's Closets 2 cfm exhaust per square feet (negative pressure).
Toilets and Lockers See paragraph SPECIAL REQUIREMENTS.
Mechanical equipment rooms - 20 AC/hour.
Kitchen Hood(s) - In accordance with ACGIH and NFPA 96.
Battery Room - 4 AC/hour and greater than the value required by paragraph BATTERY SHOP AND OTHER AREAS & system per ASHRAE Handbooks or ACGIH Industrial Handbook - A Manual of Recommended Practice

5. Cooling Loads:

Lighting/Communication/radio communication rooms, Electrical/UPS room, - Coordinate with Electrical designer (communications, radio, electrical and UPS equipment shall be assumed 100% resistive heating)
PC/monitor/printer = 840 watts total per station
People - 250 Btuh per person sensible and 200 Btuh per person latent moderately active office work per ASHRAE Handbook of Fundamentals
Physical Training - 635 Btuh per person sensible and 965 Btuh per person latent
Solar,Transmission, infiltration, etc. - ASHRAE Handbook of Fundamentals

6. Building Pressurization:

Entire building shall be pressurized to reduce radon infiltration in accordance with ETL 88-9. For negative pressurization see paragraph MINIMUM VENTLATION REQUIREMENTS.

7. Anti-terrorism & Force Protection:

As applicable, the following shall be provided for all new mechanical systems:

a. Air intakes. Air intakes to heating, ventilation, and air conditioning (HVAC) systems that are designed to move air throughout a building that are at ground level provide an opportunity for aggressors to easily place contaminants that could be drawn into the building.

1) New buildings. For all new buildings covered by this document locate all air intakes at least 10-ft above the ground.

b. Emergency air distribution shutoff. For all new buildings provide an emergency shutoff switch in the HVAC control system that can immediately shut down air distribution throughout the building. The switch (or switches) must be located to be easily accessible by building occupants. Providing such a capability will allow building occupants to limit the distribution of airborne contaminants that may be introduced into the building.

c. Utility distribution and installation. Utility systems can suffer significant damage when subjected to the shock of an explosion. Some of these utilities may be critical to safely evacuating personnel from the building or their destruction could cause damage that is disproportionate to other building damage resulting from an explosion. To minimize the possibility of the above hazards apply the following measures:

1) Utility routing. For all new buildings route critical or fragile utilities such that they are not on exterior walls.

2) Redundant utilities - Not Used.

d. Equipment bracing. Mount all overhead utilities and other fixtures to minimize the likelihood that they will fall and injure building occupants. Design all equipment mountings to resist forces of 0.5 times the equipment weight in any direction and 1.5 times the equipment weight in the downward direction. This standard does not preclude the need to design equipment mountings for forces required by other criteria such as seismic standards.

e. Under building access. To limit opportunities for aggressors placing explosives underneath buildings, ensure that access to crawl spaces, utility tunnels, and other means of under building access is controlled.

f. Mass notification. All buildings must have a timely means to notify occupants of threats and instruct them what to do in response to those threats.

1) New buildings. All new buildings must have a capability to provide real-time information to building occupants or personnel in the immediate vicinity of the building during emergency situations. The information relayed must be specific enough to discriminate appropriate response actions. Any system, procedure, or combination thereof that provides this capability will be acceptable under this standard.

8. Clearance Requirements:

a. Apparatus Room - Install as high as possible i.e.. including ductwork, HVU-1, piping, retractable air hose reels, etc.) minimum of 17.5 feet

b. Apparatus Room - Interior Fire Truck Fill Outlets shall be at 17.5 feet

c. Apparatus Room - Retractable air hose reels shall be accessible when standing on apparatus room floor.

1.2.4 Mechanical Equipment Rooms Layout Requirements

The mechanical equipment room layouts shall be provided with ample floor space to accommodate routine maintenance of equipment and have head-room to accommodate required equipment. Ample space shall be provided around equipment to allow unobstructed access for entry, servicing, and routine maintenance. Space provided in rooms for service and/or replacement of filters, coils, motors, and other equipment items shall be indicated with broken (dashed) lines on the drawings. Provisions for installation, removal, and future replacement of equipment shall be coordinated with the architectural design. The as-built drawings shall be provided using MicroStation in accordance with Section 01040 AS-BUILT DRAWINGS. The arrangement, selection, and sizing of all mechanical equipment shall be such that it can be broken down and removed from the building without dismantling any adjacent systems or structures. A 60 percent design submittal shall be provided for approval to verify mechanical room layout. Fire-rated walls shall be as required in Section 01003 ARCHITECTURAL BUILDING REQUIREMENTS. Mechanical equipment shall be energy efficient per Executive Order 12902, and ASHRAE/90.1. Servicing and maintenance areas interior and exterior to building shall be sized according to manufacturer's recommendations for equipment.

1.2.5 Mechanical/Electrical Equipment Coordination

Arrangement of all mechanical equipment and piping shall be coordinated with electrical work to prevent interference with electrical conduits that may run through the mechanical room(s) and to insure adequate space in shared chases. Mechanical equipment (pipes, ducts, etc. unless items solely serve the area) shall not be installed OVER OR WITHIN SPACE which is dedicated to transformers, panelboards, or other electrical equipment unless items solely serve the area. When electrical equipment is located in a mechanical equipment room, the dedicated electrical space shall be indicated by a dashed line and noted "Electrical Equipment Space".

1.2.6 General Mechanical Requirements

As applicable, the following shall be provided for all new mechanical systems:

a. All piping and equipment located in finished areas of the building shall be concealed or furred-in; exposed piping and equipment is only allowed in utility, equipment, storage and other rooms of this nature.

b. Provide separate isolation valves, balancing valve, flow measuring device, and pressure/temperature test taps at all heating and/or cooling units, pumps, hot water unit heaters, triple duty valves shall not be allowed,.

c. All coils shall be provided with valved drain and air vent connections.

d. Air vents shall be installed on all high points in piping systems. Drain valves shall be installed at low points and at equipment which must be dismantled for servicing.

e. Strainers shall be provided with a valved blowdown connection.

f. All vents, drain valves, and strainers which are located out of mechanical room spaces shall be provided with hose-end connections. All vents, drain valves, and strainers which are located within mechanical room spaces shall be piped to a floor drain.

g. Provide bypass piping with a balancing globe valve or cock around all non-redundant control and regulating valves. (Not applicable to Fan Coil Units.)

h. All butterfly valves shall have spool pieces upstream and downstream so that the disk can not enter any adjacent fitting.

i. Except at pump intake connections, eccentric reducers shall not be used.

j. Where steel flanges mate with cast-iron flanges, provide flat faces and full face gaskets.

k. Piping and supports shall not interfere with equipment maintenance access or pull space.

l. Dielectric unions shall be installed between dissimilar metals in soldered and threaded piping systems and insulated flanges shall be installed for welded systems.

m. All underground metallic lines, fittings, and valves; except for cast-iron piping, shall be cathodically protected in accordance with Electrical Section paragraph entitled "Cathodic Protection".

n. All exterior,underground non-metallic piping shall be buried with pipe detection tape.

o. Water and natural gas service lines shall be metered where they enter the building and buried with pipe detection tape and tracer wire.

p. All pumps, regardless of service, shall be non-overloading allowing the pump to operate at any point in its characteristic curve.

r. A thermometer shall be installed on the supply and return piping to/from each coil. Thermometers shall be legible to service mechanics standing at ground level.

s. Temperature/pressure taps shall be provided on the supply and return piping of each coil.

t. Pipe taps, suitable for use with temperature or pressure probe, shall be located at each pressure gauge.

1.2.7 Roof Mounted Equipment

Except for plumbing vents, exhaust fans, and louvered intake penthouses, no other mechanical equipment shall be located on the roof of the facility.

1.2.8 Vibration Isolation/Equipment Pads

Provide vibration isolation devices on all new floor mounted or suspended mechanical equipment. All new floor mounted mechanical equipment shall be provided with 6-inches thick housekeeping pads which extends 6-inches all

around equipment provided.

1.2.9 Permanent Maintenance Instrumentation

Provide sufficient instrumentation to aid maintenance personnel in balancing and/or troubleshooting mechanical systems. Instrumentation shall be provided in the media at each change in temperature and at all mixing points in air handling systems, at all discharges of air handlers, and at all return mains. Pressure gauges, thermometers, flow indicators, sight glasses, etc., shall be installed to be easily read from the adjacent floor. Separate pressure gauges shall be installed on both the suction end and discharge end of pumps. Provide an isolation valve on all pressure gauges. Thermometers shall have separable socket thermo-wells. Allow for the removal, repair, or cleaning of flow measuring devices without having to shut down the system. Provide a portable meter, with appropriate range, for each type of flow measuring device installed.

1.2.10 Temporary Control Instrumentation

Instrumentation shall be provided for the field calibration of all control and monitoring devices, and for the commissioning of the mechanical systems. Provide local indication measuring instrumentation for each of the HVAC control system components. Local instruments are to be independent of sensing devices used for the control system. The exceptions are air flow measuring stations, turbine flow meters, pitot tubes, and other flow measuring devices that may be shared as sensing devices by local indicating devices and control system devices and are required to be permanent. Local instruments are to be of industrial quality, must be certified as being factory calibrated, and must be capable of field calibration using standard procedures. Measuring provisions shall be provided at each varying input and control output in the system.

1.2.11 Color Coding Scheme for Locating Hidden Utility Components

To identify points of access for maintenance and operation of hidden utility components, a color coding scheme shall be provided for all areas of the facility where suspended grid ceilings are installed. Color coding scheme shall meet the requirements of Technical Specification 09900, PAINTING, GENERAL.

1.2.12 Utility Interruptions

Certain limitations on utility interruptions apply. Unauthorized utility interruptions will not be permitted. Any work that requires a utility interruption shall be scheduled in advance. Outages are subject to postponement or cancellation by site authorities without prior notification. Coordination requirements of utility interruptions shall be in accordance with SECTION 00800 SPECIAL CONTRACT REQUIREMENTS. All utility interruptions shall be identified with notes on the project drawings.

1.2.13 Power Outage Start-Up

Upon an electrical power outage, all air handling units, pumps, and other major mechanical equipment will shut down and shall be restarted in a logical and efficient manner. Timing between starts and sequence of equipment starting upon restoration of electrical power shall be provided and programmed into the HVAC temperature control system, with programming capable of being changed by the operating personnel.

1.2.14 Spare Parts Lists

Proprietary spare parts lists that require more than a 60 day lead time, and/or any special service tools shall be provided to the Government at the Final Inspection.

1.2.15 Equipment Room Diagrams

The following "As-Built" information, permanently mounted in a frame and covered by clear plexiglass, shall be provided in the mechanical equipment rooms:

a. Air distribution diagrams and damper schedules.

b. Hot water piping diagrams and valve schedules.

c. Chilled water piping diagrams and valve schedules.

d. Control diagrams, control device schedules, and sequences of operation.

1.2.16 Interior Design - Color Coordination

All mechanical items located in finished areas and on exterior walls, shall be coordinated with and painted to match the color scheme requirements of Technical Specification 09915, COLOR SCHEDULE.

1.3 EQUIPMENT IDENTIFICATION AND ABBREVIATIONS

This Section contains requirements for the identification and abbreviation of mechanical equipment.

1.3.1 Equipment Identification

Provide a brass name tag for each valve, temperature control device, control system device, etc., installed in all mechanical systems. In addition, all mechanical equipment shall be clearly identified with a conspicuously located, permanent label. Mechanical equipment shall be identified by type and sequence number. For example, the air handling unit in the building shall be identified as AHU-1, the first hot water pump shall be HWP-1, the second hot water pump shall be HWP-2, etc..

1.3.2 Abbreviations

The following list of abbreviations shall be used to describe the HVAC equipment types:

Air Dryer . . . . . AD

Air Handling Unit . . . . . AHU

BoiLeR . . . . . BLR

Cabinet Unit Heater . . . . . CUH

Chilled Water Pump . . . . . CWP

Control Air Compressor . . . . . CAC

Control Valve CV

Domestic Water Heater . . . . . DWH

Exhaust Fan . . . . . EF

Expansion Tank . . . . . ET

Fan Coil Unit . . . . . FCU

Filter Bank . . . . . FB

FinTube Radiation . . . . . FTR

Gov't Furnished Contractor Installed. . GFCI

Gov't Furnished Gov't Installed . . . . GFGI

Heating Ventilating Unit . . . . . HVU

Hot Water Pump . . . . . HWP

Horizontal Unit Heater . . . . . HUH

Local Control Panel . . . . . LCP

Motor Operated Damper . . . . . MOD

Make-up Air Unit . . . . . MAU

Not In Contract . . . . . NIC

ReHeat Coil . . . . . RHC

Relief Hood . . . . . RH

Supply Fan . . . . . SF

Transfer Fan . . . . . TF

Vertical Unit Heater . . . . . VUH

1.4 IDENTIFICATION OF PIPING

All exposed and concealed piping in accessible spaces shall be identified with color coded bands and titles in accordance with the requirements of Technical Specification 09900 PAINTING, GENERAL.

1.5 SEISMIC PROTECTION FOR MECHANICAL PIPING AND EQUIPMENT

This Section contains instructions and engineering requirements relating to the seismic protection design of new mechanical piping, ductwork, and equipment. Structural bracing and mounting of mechanical equipment mounting and shall be designed in accordance with TI 809-04 and Technical

Specification 13080 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT. The facility is to be considered Seismic Use Group III E, Design Category C,with site classifications indicated in Section 01005 STRUCTURAL REQUIRMENTS. The design of facility mechanical systems shall meet the seismic requirements of Technical Specification 15070 SEISMIC PROTECTION FOR MECHANICAL EQUIPMENT.

1.5.1 Piping

Piping within the facility, including fire protection piping, is required to have seismic restraints. All water pipes for fire protection systems shall be designed under the provisions of the current issue of the "Standard for the Installation of Sprinkler Systems" of the National Fire Protection Association NFPA 13, see Section 01008 FIRE PROTECTION REQUIREMENTS.

1.5.2 Ductwork

Ductwork within the facility, is required to have seismic restraints.

1.5.3 Floor Mounted and Suspended Equipment

See Specification 13080 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENTfor requirements in securing floor mounted and suspended equipment within the facility.

1.5.4 Miscellaneous Equipment

Miscellaneous items which consist of a number of individual components built into an assembly by the manufacturers may require additional internal reinforcements to meet Specification 13080 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT.

1.6 THERMAL INSULATION OF MECHANICAL SYSTEMS

Insulation requirements of new mechanical systems, including insulation of plumbing systems and equipment, hot water piping systems, chilled water piping systems and equipment, and the insulation of the duct systems shall meet the requirements of Technical Specification 15080 THERMAL INSULATION FOR MECHANICAL SYSTEMS. Heating piping in heated spaces and conditioned spaces shall be insulated. Hot water piping shall be required to follow tabulated thicknesses. Domestic hot and cold water piping shall be insulated. Cold piping shall have a vapor barrier. High abuse areas shall have aluminum jackets such as janitor's closets and mechanical rooms etc..

1.6.1 Insulation Covers

Provide reusable insulation covers at all check valves, control valves, strainers, filters, or any other piping component requiring access for routine maintenance. Insulation exposed to the weather or possible physical damage shall be covered by an aluminum metal jacket. All piping with metal jacket shall be identified on the drawings.

1.7 PLUMBING SYSTEM

This Section contains instructions and engineering requirements relating to the design of the new plumbing systems as required. A plumbing system

consists of the domestic hot and cold water supply distribution system to the various plumbing fixtures; make-up water piping to the various hydronic type environmental control systems (i.e. expansion tanks, boilers, etc.); fixtures, and fixture traps; make-up water to Food Service Equipment; soil, waste, and vent piping; and shall extend from connections within the structure to a point 5 feet outside the structure. The design of all plumbing systems shall, unless otherwise stated herein, comply with the most current International Plumbing Code and shall meet the requirements of Technical Specification 15400 PLUMBING, GENERAL PURPOSE. Traps for lavatories, and sinks shall be chromium-plated, adjustable-bent tube, 20-gauge brass, where exposed. All backflow preventers shall be installed for accessibility per Uniform Plumbing Code and shall comply with the requirements of the Department of Environmental Quality (DEQ) of the State of Colorado. State licensed plumbers shall install and/or test backflow preventors and cross connections devices. For Fire Protection backflow preventor requirements see Section 01008 FIRE PROTECTION REQUIREMENTS. Lead content in the water distribution system (including in-line devices) shall comply with SDWA of 1998 with amendments and ANSI/NSF 61, section 9. In-line devices shall include water meters, building valves, check valves, meter stops, valves and fittings and backflow preventors. A grease interceptor in the Kitchen sewer system shall be provided. Provide a separate line for sanitary line serving Toilets etc. from kitchen. Underground soil, waste and drain may be cast iron piping. Soil piping does not require any cathodic protection.

1.7.1 Water Service Entrances

New water service entrance lines shall be installed below the recognized frost line and enter the building through the mechanical room floor. New water service entrances shall be provided with a positive displacement type water meter up to and including 2-inch and a turbine type water meter for greater than 2-inch, a pressure reducing valve and a reduced pressure principal backflow preventer with isolation valves located inside the building. Meters shall be provided with a direct non-resettable, digital & remote readout. Meters shall have a pulse switch initiator capable pulse output of operating up to speeds of 500 pulses per minute with no false pulses and shall require no field adjustments or 4-20 mA output. Initiators shall provide the maximum number of pulses up to 500 per minute that is obtainable from the manufacturer. Meters shall be connected to Williams Electric Company Temperature controls and UCS system.

1.7.2 Piping Runs

Piping runs in buildings shall be arranged to not interfere with movement of personnel and equipment. Neither water nor drainage piping shall be located over electrical equipment or panels. Domestic water piping located outside of mechanical equipment areas shall be routed in the ceiling space above the corridors. Water and waste piping shall not be located in exterior walls or other spaces where there is possibility of freezing. Where piping is to be concealed in wall spaces or pipe chases, such spaces shall be checked to insure that clearances are adequate to properly accommodate the piping. Water piping shall be designed not to exceed a velocity of 8 fps at full flow.

1.7.3 Pipe Materials

Table I in Technical Specification 15400 PLUMBING, GENERAL PURPOSE identifies available material alternatives for above/below ground soil, waste, and vent. Materials for aboveground domestic hot and cold water

distribution systems shall be copper. All copper piping 2-inch and smaller shall be soldered using 95/5 tin antimony solder, piping 2/1/2 inches and larger shall be brazed. Multi-flame torch is not required for soldering or brazing. The Tables shall be edited to indicate which materials shall be used for installation of each system.

1.7.4 Protection of Water Supplies

Cross connections between water supply piping and waste, drain, vent, or sewer piping are prohibited. Reduced pressure type backflow preventers shall be provided on all make-up water systems.

a. Lawn Irrigation

An automatic lawn sprinkler irrigation system shall be provided for the sodded lawn and landscaped areas of the Fire Crash Rescue Station. Design requirements for the sprinkler irrigation system is defined in the Section \=1002=\ Site Work under paragraph entitled "Composite Utilities". A reduced pressure principal backflow preventor with isolation valves located in the mechanical room (reference paragraph MECHANICAL ROOM LAYOUT REQUIREMENTS) shall be provided in the supply line to each lawn irrigation system in order to protect the domestic water system in the building from the lawn irrigation system. Piping within 5-feet of the building shall be in accordance with Guide Specification \=15400=\.

1.7.5 Fixtures

Plumbing fixtures (water closets, urinals, lavatories, kitchen sinks, etc.) shall conform to ASME standards, the requirements of Technical Specification 15400 PLUMBING, GENERAL PURPOSE and Executive Order 12902 with; lead-free faucets. End-point devices shall meet lead leaching requirements of ANSI/NSF 61, section 9, ie. (lavatory faucets, kitchen and bar faucets, residential ice makers, supply stops and end point control valves). In-line devices do not have to meet section 9 (ie. bath and shower valves, all drains, backflow preventors). Work shall consist of but not be limited to the following. Coordinate location with the architectural plans (see also paragraph FOOD SERVICE EQUIPMENT).

a. For washer and dryer hookups see paragraph WASHER CONNECTIONS and LAUNDRY ROOM EXHAUST.

b. Provide electric water cooler located near Men's Toilet, Communications room and dual service near handicapped toilets.

c. Provide floor-mounted corner type Janitor's closet sink in Janitor's closet and disinfection/decon room.

d. Waterless urinals shall not be allowed; maintenance is required to the trap once every 6 months.

e. Water conservation fixtures (low flow type) with automatic metering devices conforming to the Technical Specification 15400 shall be provided in all private toilets. Automatic operating hard-wired electronic sensor flush valves shall be provided for urinals in the Men's Toilet. Automatic operating hard-wired electronic sensor water closets and faucets shall also, be provided in the Men's & Women's Toilets & Handicapped Toilets. Battery-operated sensors shall not be allowed. Hard-wired electronic sensors shall be provided with emergency pushbutton for

maintenance.

f. Provide showers in Toilet room 126, Women's Shower and Men's/Locker Room.

g. Laundry Room: Provide Laundry sink in the Laundry room next to two heavy-duty front loading washers and two front loading dryers. The laundry is for cleaning physical training and duty uniform clothes only.

1). Automatic Clothes Washer GFGI.

Washing machines provided shall have the follow features: non-coin operated, electric, commercial grade, large capacity (2.65 cubic feet), front loading, and a stainless steel drum. All machine utility connects shall be concealed. Energy Factor = 4.01.

2). Electric-dryer GFGI.

Dryer provided shall have the following features: non-coin operated, electric, commercial grade, large load capacity 6.5 cubic feet, front loading, autodry, drum light and easy-to-clean lint filter. Do not expose ducts, conduit, pipes etc. on ceiling or walls of the laundry room. All machine utility connects shall be concealed. Dryer venting shall use a rigid duct system. Dryers shall be stackable. See paragraph LAUNDRY ROOM EXHAUST.

h. Fire Gear Cleaning room provides cleaning of protective clothing. A double compartment utility sink shall be provided. Low pressure compressed air shall also, be provided. See WASHER-EXTRACTOR paragraph below and paragraph WASHER-EXTRACTOR CONNECTIONS.

1. Washer-Extractor (for fire gear)

a. Provide one washer-extractor for fire gear cleaning room. Unit shall have the following dimensions wide x deep x height (34.5 in. wide x 44.3 in deep x 53.8 in height). Unit shall have 30 different programmable wash formulas, including 10 pre-programmed strictly for decontaminating fire fighters gear. Units shall be 35 lb. capacity. Power requirements 208/60/3 phase, with FRN10 fuses in a separate disconnect. Shall be provided with a 6-inch concrete base. Pre-programmed wash formulas shall include the following:

1. Light soil turnouts
2. Heavy soil turnouts gloves
3. Moisture barriers
4. Breathable vapor barriers
5. Oil-contaminated gear
6. Brush gear
7. Hoods/suspenders
8. Truck towels
9. Stationwear
10. Sheets/pillowcases

i. Break room Sink.
Provide single bowl stainless steel bar sink in the break room.

j. Water Supply for Coffee Maker (Break room)

Provide a 3/8" domestic cold water supply line for coffee maker use. The line shall be stubbed out approximately 2 inches inches.

k. Provide two utility sinks in the Apparatus Room.

l. Garbage Disposal

Garbage disposal shall be provided in sink in double sink in kitchen and shall conform to commercial standards, continuous feed, minimum 1/2 hp heavy duty motor, corrosion resistant grinding elements, two 360-degree stainless steel anti-jam swivel impellers, manual motor reset, and sound insulation. A plug connector may be required.

m. Ice Machine (Kitchen) Water Supply

Provide a 3/8" domestic cold water supply line for ice machine use. The line shall be stubbed out approximately 2 inches from the wall and shall be provided with a shut-off valve. Also, provide activated carbon filter in the makeup water line and a sediment filter.

n. Water Supply for Coffee Maker (Kitchen)

Provide a 3/8" domestic cold water supply line for coffee maker use. The line shall be stubbed out approximately 2 inches inches from the wall and shall be provided with a shut-off valve.

o. Provide a domestic cold water supply line for the humidifiers use in the mechanical room including shut-off valves for both.

p. Provide a water softener for the water service to the building. The water softening system shall be as specified in Section 11250 WATER SOFTENERS, CATION-EXCHANGE (SODIUM CYCLE). Any water analysis required shall be done by the Contractor.

q. Provide High pressure washers with soap/water will be provide next to every other apparatus room shop air exterior columns.

1.7.6 Janitor's Closet Sinks

A enameled cast iron floor mounted type service sink shall be provided in janitor's closets. Overall sink dimensions shall be approximately 28" x28". The depth of the floor sink bowl shall be approximately 10-inch.

1.7.7 Electric Water Coolers

Bi-level, accessible or barrier-free, mechanically refrigerated electric water coolers shall be provided (as indicated on Architectural plans), with part of each suitable for use by the physically handicapped where indicated. Bottom spout unit shall be 27-inch above finished floor. Spout shall be 34-inch above finished floor. The push bar shall be front or front and side mounted. Cooler shall be lead-free and use CFC-free refrigerant R-134a. Unit shall provide a minimum of 8 gph at 50 degree F.. Coolers shall be certified to meet ANSI/NSF 61, Section 9 and meet lead leaching requirements of section 9.

1.7.8 Water Hammer Arresters

Commercially available water hammer arresters shall be provided at all new quick closing valves such as flush valves and solenoid valves and shall be installed according to manufacturers recommendations. Vertical capped pipe columns are not permitted in lieu of water hammer arrestors.

1.7.9 Disinfection/Decon Room

Emergency operations shall require a disinfecting room for cleaning of emergency medical equipment. Room shall meet cleanliness requirements of NFPA 1581. Disinfection/Decon room and medical storage shall comply with all technical requirements of NFPA standards and paragraph 3-8 of NFPA 1581. Disinfection/Decon room shall be provided with a triple-container sink with faucets, and wall faucet.

a. Three-Compartment Sink

Sink shall conform to the applicable requirements of the National Sanitation foundation (NSF) International Standard; Food Service Equipment Listing. Sinks shall be constructed of a minimum 14-gauge stainless steel. Sinks shall be equipped with waste and overflow fitting, drain plug with quick opening valve, and faucets. The sinks shall have approximately 24"x 24"x 24" compartments.

1. Faucets.

Faucets shall be provided for all three compartments. Fittings shall have swinging spout, approximately 8-inch length, with foot-operated operation.

1.7.10 Laundry Room & Fire Gear Cleaning room & Apparatus room Utility Sinks/Faucets

A utility sink shall be provided in the laundry room, fire gear cleaning room & two in apparatus room. The sink shall be wall mounted, white enameled cast iron. The overall sink dimensions shall be approximately 27" x 23". The sink shall have an extra deep bowl; minimum of 13".

1.7.11 Wall Hydrants

Exterior freeze-proof wall hydrants with vacuum-breaker-backflow-preventer shall be located on exterior outside walls at 200 feet intervals of the facility for exterior garden hose use. A wall hydrant shall be provided near Mechanical Room exterior door. Exterior wall hydrants shall be mounted 2-feet above finished grade.

1.7.12 Wall Faucets

An interior wall faucet shall be provided in Mechanical Equipment Rooms. Wall faucets shall be mounted 36" above the finished floor. As a minimum one standard hot and cold water garden hose bibb shall be provided for every other column in the vehicle bays in the apparatus room for a total of two on each side of the apparatus room. One wall cold water faucet shall be provided in the disinfection/decon room.

1.7.13 Trench Drains

Trench drains shall be provided (these are structural drains in the

apparatus room).

1.7.14 Emergency Shower/Eye washes

Emergency Shower/Eyewash shall be provided (2) in the apparatus room. Each eyewash and combination shower/eyewash shall be equipped with a mixing valve station located next to unit. All units shall be connected to the building plumbing system.

a. Mixing Valve Stations

1. Station shall be constructed to thermostatically control the mixing of hot and cold water and to deliver tempered water at a desired temperature regardless of pressure or input temperature changes. Station shall be a thermo-mechanical system with thermally activated and pressure-activated safety features that do not require electricity for operation. Outlet temperature shall be adjustable 59 to 84.2 degrees F. and shall be initially set at 69.8 degrees F.. Station shall be equipped with 1-1/4" inlet and outlet manifold piping with associated isolation valves, unions, strainers on inlets, checkstops, vacuum breaker, outlet temperature gauge, bypass valve, mixing valve, temperature adjustment knob, etc..

2. Safety features shall include: a) a pressure relief cold water bypass of the main mixing valve that protects against constricted flow of either hot or cold water; b) scald protection including a high temperature limit control valve (set @ 84.2 degrees F. non-adjustable that modulates incoming hot water; and c) the high temperature valve opens to provide tempered water when there is a unregulated flow of cold water (pressure relief valve is operating).

3. Cabinets for mixing valves shall be constructed of a size to accommodate the equipment to be factory installed therein, shall be rigidly assembled with joints welded, and shall be punched or drilled for the top passage of required pipes. Cabinets shall be fiberglass or 16 gauge minimum sheet metal. Sheet metal cabinets shall be primed and factory finished with baked on enamel. Cabinets shall include a lockable flush-fitting hinged front door with a viewing window. The station isolation valves required can be installed outside the cabinet if they are tamper resistant type.

1.7.15 Service Stop Isolation Valves

For normal maintenance or replacement, servicing stop isolation valves shall be installed in water connections to all installed new equipment and new fixtures. In addition, stop valves shall be provided to isolate portions of systems so as to not require shutdown of entire systems. Stop isolation valves for piping and equipment shall be shown on the drawings. Service stop isolation valves to faucets shall meet ANSI/NSF 61, section 9 lead leaching requirements.

1.7.16 Floor Drains

A floor drain shall be provided in mechanical equipment rooms, toilet rooms/lockers' shower drying areas including rooms, handicapped toilets, men's toilet, men's sinks' room, women's toilet, laundry room, fire gear cleaning room, two in disinfection/decon room, one in each fire extinguisher maintenance rooms, and one in each janitor's closets.

a. To prevent traps from drying out, deep seal traps or automatic trap primers shall be provided on all floor drains located in areas other than mechanical rooms.

b. The mechanical equipment rooms shall be provided with sufficient floor drains to accommodate routine maintenance and drain down of equipment and piping within the room without running drain pipes over the floor. In addition, a floor drain shall be provided in kitchen, near humidifiers, dishwasher(s) & ice machine areas. Floor drains in the Kitchen may be of the floor sink or trench drain type. A floor sink may be provided for each indirect waste plus floor drains. Multiple indirect wastes can be routed to a single kitchen floor sink or even a hub drain where the local code allows.

1.7.17 Kitchen Grease Interceptor

Construction of trap, interceptor minimum size (interior or exterior) installation shall conform to local code requirements. Unit shall meet the requirements of PDI Standard PDI-G101, installed flush with the floor. Minimum capacities shall be 75 gpm, 150 pounds grease, 105 gallon holding volume and 4-inch threaded outlet unless otherwise required by local codes. Size shall depend on volume of fixtures, capacity in gallons and drainage period of 1 minute.

1.7.18 Cleanouts

On straight runs of pipe,cleanouts shall be provided at not more than 50 feet apart. Cleanouts shall be provided at each change of direction of pipe and shall be provided at the base of all storm, soil, waste, and vent stacks.

1.7.19 Plumbing Vents

Where feasible, combine circuit vents in a concealed space to a main vent through the roof in lieu of an excessive number of individual vents through the roof. All vent lines through roof shall be 4-inch and terminate a minimum of 6-inch above finished roof. Where vents connect to horizontal soil or waste lines, the vent shall be taken off so that the invert of the vent pipe is at or above the centerline of the horizontal soil or waste pipe.

1.7.20 Duct Drainage

Outside air intake louvers and louvered penthouses shall be ducted and shall have provisions to dispose of melted snow and wind-blown rain which enters through the louvers. The duct seams shall be sealed watertight (soldering or brazing is not required) and a drain provided at the duct low point. The drain shall be routed to a floor drain. Duct access doors shall be provided near the louvers. Motorized dampers shall be provided at the exterior of the building.

1.7.21 Domestic Hot-Water Boilers

Domestic water heaters (Boilers)140 degrees F. shall be located in the mechanical room and shall be low NOx of 30 ppm or less. Water heater capacities shall be equal to the maximum demand of all fixtures operating. New heaters shall be gas fired with a combined water storage tank. The capacity of the water heaters shall be adequate to meet the peak hot water requirements of the facility and shall be designed in accordance with

Chapter 48, Service Water Heating, of the 1999 ASHRAE HVAC Applications Manual. An inlet water temperature of 39.2 degrees F. shall be used for sizing the water heater. Minimum efficiency shall be determined by the low NOx gas-fire boiler requirements. Water storage temperature shall be approximately 140 degrees F.. Provide 110 degrees F. water at lavatory faucets by using a mixing valve(s). Hot water for dishwasher purposes shall be provided by a built-in booster heater in the dishwasher located in the Kitchen.

a. Micro-processor based energy savings device (controller)shall be provided for each hot water heater (boiler) to time the last off-cycle and compute percentage of that period (the economy factor) and then delay ignition of the burner by that calculated additional time. By constantly applying this percentage, the amount of delay varies according to the last off-cycle. Longer off-cycles mean less demand and the micro-processor calculates longer delays. Shorter off-cycles mean greater demand and controller calculates shorter delays. Should the temperature of the water drop to a programmable low limit, due to a sudden increase in demand, the micro-processor immediately cancels any extended off-cycle, allowing the burner to ignite. Controller is wired in series between the operating control and the burner controls. During a power failure, a magnetic relay closes, returning the system to its preinstalled condition. The micro-processor shuts its self-down in the event of a power failure and returns to the last programmed setting when correct power is restored.

b. Domestic Water Heater Vents

Domestic water heater vents shall be type "B", and shall conform to UL 441. Boiler stacks and domestic hot water heater vents shall not be tied together. Height of vents shall be as required by NFPA 54 and shall be provided with a rain cap. Also, see paragraph Vents and Stacks.

1.7.21.1 Domestic Hot Water Recirculation System

Domestic hot water recirculating pumps shall be provided for each water heater. Pump sizing shall be in accordance with simplified pump sizing method 1995 ASHRAE Applications Manual unless specific conditions warrant the need for more detailed calculations. The system shall continually circulate domestic hot water in order to insure that domestic hot water is available at each fixture without delay. The domestic hot water recirculating pumps shall be all bronze for long life. A clock, DDC or other automatic control shall be installed on domestic hot water circulation pumps to permit operation only during periods of occupancy plus 30 minutes prior. Initial operation shall be 24 hours per day.

1.7.22 Storm Drainage

Where required storm drainage system shall include roof drains, overflow drains, leaders, and conductors within the building to a point 5 feet outside the building. Where required by the architectural drawings, roof drains, with auxiliary overflow drains, shall be provided at the low points of the roof. Storm water shall be routed through interior downspouts and piped directly to the facility storm system. Roof drains shall be designed for a maximum rainfall rate of 4.3 inches per hour with one common pipe. All elbows for the storm drainage and overflow drainage piping 10 inches and smaller shall be 90 degree short sweep elbows.

1.7.23 Cathodic Protection

Cathodic protection shall be provided for any new underground metallic piping, fittings, and valves except cast iron. Design of cathodic protection system shall in accordance with Section 01007 ELECTRICAL REQUIREMENTS, paragraph entitled "Cathodic Protection".

1.7.24 Compressed Air System

This section contains guidance for designing compressed air systems including piping and compressors. Where special conditions and problems are not covered, industry standards shall be followed. Compressed air systems shall be designed in accordance with ASME B19.1 and B19.3 Safety Standards for Compressor Systems and Technical Specification 15400. New compressed air piping shall be black steel. Minimum shop air compressor capacity shall be at least 140 scfm @ 125 psi. The compressor shall be located in the each Fire Extinguisher Maintenance rooms and shall provide one air outlet in Fire Extinguisher Maintenance rooms, Fire Gear Cleaning room, and Breathing apparatus room.

a. Compressed air outlets shall be provided for servicing vehicle tires, brakes and operating air tools. Outlets shall be provided between each set of two bays on retractable hose reels mounted from roof joists for a total of two locations on both sides of the apparatus room. Retractable air hose reels shall be accessible when standing on the apparatus room floor. A total of four hose reels shall be provided in apparatus room.

b. Compressor Selection.

Compressor and all accessories shall conform to American society of Mechanical Engineers (ASME) B19.1 and B19.3, ASME Boiler and Pressure Vessel Code Section VIII, PTC-9 & PTC-10, and Instrument Society of American (ISA) S7.3, as applicable. Where lubricating oils cannot be tolerated at the point of use, oil-free operation is required in a non oil-free compressed air system,i.e. coalescing filters shall be used to remove solids, moisture, and oil from the air stream in lieu of providing an oil-free compressor.

c. Analysis.

An analysis shall be made for each compressor selection to insure that the best value is obtained. Comparisons of such items including, but not limited to, brake horsepower (bhp) x per x scfm , unloaded horsepower, expected compressor life, and expected operation and maintenance costs, should be made between the different types of compressors before final selection is made. The analysis shall be included in the design analysis.

d. Compressor Capacity.

Total air requirements <u>will not</u> be based upon the total of individual maximum requirements, but upon the sum of the average air consumption of air operated devices. Determination of the average air consumption is based on the concept of load factor (the ratio of actual air consumption to the maximum continuous full-loaded air consumption). The Compressed Air and Gas Institute (GAGI) Compressed Air and Gas Handbook explains making the calculation, add 10 percent to the estimated consumption for leakage. The total is the compressor capacity required for design.

e. Compressor Location.

Adequate aisle space shall be provided between items of equipment for

normal maintenance as well as for equipment removal and replacement per manufacturer's recommendations.

f. Foundations.

Foundations which are isolated from the building structure shall be provided for low pressure compressor. Six inch concrete housekeeping pad shall also be provided.

g. Make-up Air.

Compressor located in wet Fire extinguisher maintenance room,shall be provided with a wall opening for make-up air. Exterior wall opening shall be provided with louver and motorized damper, damper shall open when air compressor starts and vice versa.

h. Piping

Compressed air piping shall be schedule 40, black steel.

i. Underground Piping

Underground compressed air piping shall not be permitted.

j. Pipe Sizing.

Compressed air piping shall be sized in accordance with Industry Standard.

k. Compressed Air (CA) Outlets.

A ball valve, pressure reducing valve (one for 125 psig), coalescing filter, and a quick-disconnect shall be provided at each compressed air outlet. Type of compressed air quick-disconnect shall be coordinated with the air-devices used by the end User. Air outlets shall be located 36-inch above finished floor.

l. Retractable overhead air hose reels in Apparatus room

A ball valve, pressure reducing valves (one for 125 psig, coalescing filter, retractable overhead air hose reel, which shall be accessible when standing on the apparatus room floor and a quick-disconnect shall be provided. Type of compressed air quick-disconnect shall be coordinated with the air-devices used by the end User. Two retractable overhead air hose reels shall be provided on each side of apparatus bays mounted on the roof joists. Retractable air hose reels shall be accessible when standing on apparatus room floor. Total of four retractable overhead air hose reels shall be provided.

m. Refrigerated Air Dryer.

A refrigerated dryer shall be provided, sized to match the compressor. A floor drain shall be located next to the dryer. Refrigeration equipment provided shall have an ozone depletion factor of 0.05 or less. HCFC-22 shall not be allowed. HCFC-22 alternatives shall be documented in the design analysis and catalog cuts provided for three manufacturer's before an alternate refrigerant's equipment will be allowed.

1.7.25 Washer Connections

a. Automatic Clothes Washer Connections - Drainage and hot and cold water supply shall be provided for the two automatic clothes washers. Washer connection, complete with 2-inch drain, 3/4-inch hose thread supplies, and electrical outlets for both washer and dryer, shall be provided in a standard manufactured recessed wall box with single-face plate. Box shall be constructed of sheet steel and shall have a corrosion-resistant epoxy enamel finish. Boxes shall be mounted 3.9 feet above the finished floor. Finish color shall be painted to match adjacent finishes.

b. Washer-Extractor connections

Provide 1/2" water supply (hot and cold) for Washer/Extractor. Provide 3-inch drain in back which shall drain into trough 12"x12"x36". Also, provide 1/4" low pressure compressed air outlet & connection.

1.7.26 Government-Furnished Contractor-Installed (GFCI) SCBA Compressor System

a. The existing mobile SCBA compressor, cascade & controls, (4) 6000 psi high pressure cylinders, mask cabinet, tool box, PC, monitor and printer, fill station, 30 SCBA units along with 75 air bottles and storage racks shall be relocated from the existing Fire Station Building. This is to be done after the new fire station has been completed and with two weeks notice to the Contracting Officier and shall be relocated and installed by the Contractor in 72 hours. Relocate existing SCBA system to SCBA maintenance room. Reinstalled GFCI SCBA system shall meet the requirements of NFPA 1404.

b. The SCBA system provides approximately 15.7 cfm at 6000 psig.

c. New intake air piping for the relocated SCBA air compressor shall be provided. It shall be routed through the roof, then down to the existing SCBA high pressure compressor using a 3-inch PVC pipe fresh air inlet either from roof line or high on the exterior wall. . Then it shall be connected to the relocated SCBA compressor by a 1- 1/4-inch flexible hose approved by the manufacturer. Intake air pipe shall penetrate the roof, extend 3' feet above the roof and be provided with a 90 degree elbow down which shall be covered with birdscreen. Intake air for the relocated SCBA air compressor must be located 49 feet from each of the following:

1. Any contaminated air source
2. Vehicular exhaust fumes
3. Emergency generator exhaust
4. Restroom and kitchen exhaust
5. Mechanical exhaust.

d. GFCI Compressor Location.

Adequate aisle space shall be provided between items of equipment for normal maintenance as well as for equipment removal and replacement per manufacturer's recommendations.

e. Foundations.

New foundations are not required.

f. Make-up Air.

Relocated GFCI SCBA compressor shall be located in Breathing apparatus room: a roof opening shall be provided for make-up air. Exterior roof opening shall be provided with raincap. Use 6-inch PVC for ducted outside air with accessible drain valve (& bushing) at bottom and provide vertical supports per section 15400. Provide a PVC tee (& bushing) for connection to the compressor intake filter assembly. Connection to Compressor shall be by (approx. 6' of vacuum hose) 1-1/4" flexible hose (& adapter). The connection to the tee must be lower than the compressor intake to prevent accumulated condensed water from passing to the compressor. A floor drain shall be located next to the drain valve.

g. Piping

New high pressure compressed air piping shall be stainless steel tubing rated for 6000 psig.

h. Underground Piping

Underground high pressure compressed air piping shall not be permitted to outlets.

i. Pipe Sizing.

New high pressure compressed air tubing shall be sized in accordance with Industry Standard.

j. Breathing Air (BA) Outlets.

A ball valve, pressure regulator and a quick-disconnect shall be provided at each breathing air outlet. The type of compressed air quick-disconnect shall be coordinated with the air-devices used by the end User. Two outlets shall be provided between GFCI SCBA high pressure compressor; one on relocated workbench in SCBA Maintenance room and one in apparatus room, 36" above finished floor.

1.7.27 Interior Fire Truck Fill Outlets

Provide ten fire truck fill stations on the interior of each apparatus bay of apparatus room located at the centerline above the fire trucks, i.e. when parked in each bay. Only one shall operate at a time. Each fire truck fill outlet shall be provided with 2 1/2-inch NSN thread (with ball valve) and shall be freezeproof. The main shall be a 3-inch common manifold for all outlets. Minimum operating pressure for each fire truck fill outlet shall be 20 psi. Minimum operating flow rate shall be 200 gallon per minute. These outlets shall be connected to the domestic water service. Outlets shall be 17.5 feet above the finished floor.

1.7.28 Interior Fire Truck Fill Outlets ("Standpipes")

Provide four "standpipes on the interior of the apparatus room for exterior use by firefighting personnel filling vehicles. Two "standpipes" shall be located on the interior of the apparatus room south side and two exterior of the apparatus room north side. Two fill outlets shall operate at a time. Standpipes shall be evenly spaced from each other along the interior of the apparatus room and next to the exterior wall as indicated on sheet. Each standpipe shall be provided with 2 1/2-inch NSN thread, single fire department connection and shall be freezeproof. Each standpipe shall be independently operated and the tool used to operate these hydrants shall be able to operate without any obstructions. Minimum operating pressure for

each standpipe shall be 20 psi. Minimum flow rate for each hydrant shall be 200 gallons per minute. These standpipe shall be connected to the domestic water service.

1.8 EXTERIOR GAS DISTRIBUTION SYSTEMS

This Section contains instructions and engineering requirements relating to the design of the new exterior natural gas distribution system where required, including the building gas service lines and gas service regulator assemblies. The gas distribution systems shall be designed in accordance with NFPA-54, and shall meet the requirements of Technical Specification 02556GAS DISTRIBUTION as attached.

1.8.1 Service & Main Lines

a. A new service line shall be provided and connected to the existing 6 inch 50 psi main line that is located east of the facility and shown on concept drawing U1.01. Pressure shall be reduced at the main regulator serving each building from 90 psig to 25 psig. The pressure serving each building shall be a minimum of 20 psig regulated down to building pressure required. The distribution system for the gas line will be all plastic as indicated. A 50 to 25 psi gas pressure regulation station shall be provide where indicated. The gas line shall be provided with an isolation valve. The tap into the existing main line shall be a "hot tap" and the Base Fire Department shall be given 30 days advance notification of the date of the tap (see minimum service line sizing paragraph Service Line Sizing). The point of connection shall be provided with a shutoff plug valve, conveniently located outside of any traffic area and protected with a valve box. Thirty days notice shall be given the Contracting Officier when the gas tie-in is to be made.

b. Provide underground line for barbecue grill for grill location). Provide isolation valve and pressure regulator.

c. Not Used.
d. Not Used.

e. Service lines shall not be installed under or routed thru the facility. Except for piping located at the new gas meter/service regulator assemblies, no aboveground gas piping shall be exposed to view. The service line shall enter the buildings in an accessible location outside the mechanical room areas. The gas meter/service regulator assemblies shall be hidden from view to the greatest extent possible.

f. Service lines to buildings shall run parallel and/or perpendicular to the building lines, shall be buried at least 18" below the ground surface, shall not be laid in the same trench with other utilities, and shall be above other utilities whenever they cross. Main lines to buildings shall run parallel and/or perpendicular to the building lines, shall be buried at least 24" below the ground surface, shall not be laid in the same trench with other utilities, and shall be above other utilities whenever they cross. New gas lines shall not be laid under paved streets, parking lots, roads or in other locations subject to heavy traffic whenever practicably avoidable and economically feasible to locate elsewhere. Whenever it is necessary to locate gas lines in such locations, the lines shall be protected by suitable encasement or by burying to a depth to provide at least 5 feet of cover over the top of the pipe except gas lines shall be provided with encasement when laid under new or existing paved streets, and

parking lots.

g. All manholes, or valve boxes of any nature within the project that do not conform to the new finish grade in either surfaced or unsurfaced areas shall be adjusted to the new finish grade. Where manholes, or valve boxes fall within a surfaced or unpaved roadway or parking, the existing frames and cover shall be removed and replaced with a heavy-duty frame and cover. The structure shall be adjusted as needed to fit the new conditions. All structures shall be of a type suitable for the intended use and shall conform to the requirements of the applicable section of these specifications

1.8.2 Service Line Sizing

The size of the service lines to new Fire Crash Rescue Facility and gas barbecue grill shall be sufficient to supply the demand without excessive pressure drop and shall not be less than 1-inch in size.

1.8.3 Service & Main Line Materials

All new underground service lines shall be polyethylene and all aboveground lines steel.

1.8.4 Service & Main Line Markers and Tracer wire

New underground service lines shall be identified by a permanent on grade utilities marker which indicates the type of service and depth of burial. Markers shall be located a maximum of 100 feet apart on straight runs and at every change in direction. Markers in high traffic areas shall be protected from physical damage. Markers shall consist of a stamped or engraved brass name plate embedded in concrete. Tracer wire shall be 18 gauge AWWG copper secured to piping at not more than 1 meter intervals.

1.8.5 Service & Main Line Protection

New below grade lines shall be protected from physical damage by placing a continuous, detectable plastic ribbon in the trench such that any excavation will uncover the ribbon prior to reaching the line. When non-ferrous service lines are in stalled, a foil backed magnetic tape shall be installed above the pipe to permit locating with a metal detector.

1.8.6 Cathodic Protection

Cathodic protection shall be provided for all underground metallic piping and fittings except cast iron piping. Design of cathodic protection system shall in accordance with Section 01007 ELECTRICAL REQUIREMENTS, paragraph entitled "Cathodic Protection".

1.8.7 Gas Meters

A new gas meter shall be provided as part of the new service regulator assemblies. Meters shall be provided with a direct non-resettable, digital readout. Meters shall have a pulse switch initiator capable pulse output of operating up to speeds of 500 pulses per minute with no false pulses and shall require no field adjustments or 4-20 mA output. 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 2.8 cubic meter of gas. Meters shall be connected to existing EMCS Williams Electric Company temperature controls and UCS system.

1.8.8 Gas Barbecue Grill

Provide 36-inch Built-In Grill with Rotis, integrated side burner (no insulted jackets). Overall dimensions 36"x 24". Exterior finish shall be manufacturer's standard. Grill to be AGA design certified. Single 3/4" gas connection with manual shut-off valve and gas regulator shall be provided.

1.9 INTERIOR GAS PIPING SYSTEMS

This Section contains instructions and engineering requirements relating to the design of new interior natural gas piping systems. Interior gas piping systems shall extend from the outlet of the gas service regulator/meter assembly to the point of connection of each gas utilization device. The aboveground gas piping system shall be steel designed in accordance with NFPA 54 and shall meet the requirements of Technical Specification 15190 GAS PIPING. All interior gas piping shall be painted with one coat of primer and two coats of black paint.

1.9.1 Gas Piping

Piping shall be sized in accordance with NFPA 54 to supply the demand without excessive pressure drop between the point of delivery and the gas utilization equipment. Minimum interior gas pipe size shall be 3/4". The calorific value of the natural gas to be used in calculations for sizing equipment and piping is 805 cfh. Gas piping shall be shown on the mechanical HVAC Drawings.

1.9.2 Equipment Connections

The final connection to gas equipment shall be made with rigid metallic pipe and fittings. Accessible gas shutoff valve and coupling are required for each piece of gas equipment. Flexible connectors must be used for kitchen range and shall be at least 40 inches long. Other acceptable uses of flexible connectors include equipment located where accessibility shall be limited to qualified personnel. Flexible connectors must conform with ANSI Z21.45 except flexible connectors for movable food service equipment must conform to ANSI Z21.69. In addition to cautions listed in instructions required by the ANSI standards, flexible connectors <u>will not</u> be allowed to pass through equipment cabinets. Accessible gas shutoff valve and coupling are required for each piece of gas equipment.

1.10 Not Used

1.11 HYDRONIC HEATING SYSTEMS

Heating system shall be a forced-air/hot water system consisting of two natural gas fired boilers in parallel, water distribution system, circulating pumps, distribution pumps (and associated space heating equipment). Boilers shall be of the low NOx type of 30 ppm or less. The heating system shall be capable of providing heat for the building air ventilation systems. The heating water piping system shall be used to circulate hot water to the heating equipment during the heating season of Sep 15 to May 15. Piping shall utilize reverse-return configuration. The heating system designs shall meet the requirements of Technical

Specification 15569 WATER AND STEAM HEATING; OIL, GAS OR BOTH; UP TO 20 MBTUH and, unless otherwise stated, shall comply with the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Handbooks and Terminology of HVAC&R guide. The heating system design shall include safeguards to protect against freezing damage. Hot water pipe velocities shall be sized to not exceed 5 feet per second.

1.11.1 Boilers

The hot water supply shall be heated to 200 degrees F. and supplied by two natural gas-fired, cast iron, fire-tube or water-tube type boilers rated for a pressure of 30 psig. Each boiler shall be provided with a forced-draft unless noted otherwise,and modulating burners and shall be interlocked with the hot water pump flow sensor to provide a continuous flow of hot water to the facility at outdoor temperatures below 60 degrees F. (adjustable). The hot water system supply temperature to the space shall be automatically controlled by manufacturer's standard controls. The boilers shall be interlocked with the heating water circulating pumps, through the control system, such that the boilers' burner can notfire unless flow is present through the boiler's piping system. There shall be a heating water circulation pump per boiler, three-way valve and two distribution pumps arranged in parallel. The boilers shall have a minimum efficiency of 85 percent but, shall meet low NOx requirements of 30 ppm or less. The use of a natural draft boilers shall not be allowed. Boiler reset shall be 200°F@ 0°F & 120°F @ 72°F. in the secondary loop.

a. If a high efficiency (condensing type) boilers are provided, to meet high efficiency requirements and low NOx requirements, the hot water shall be supplied at a lower temperature ie. 140°F supply and returned at 120°F. All heating coils, pumps, and hot water heating equipment shall be sized an selected for these temperatures to ensure all equipment is sized larger to take into account the lower return temperature upon which these boilers are normally selected. The use of a natural draft boilers shall be allowed if the minimum efficiency of 85 percent and low NOx 30 ppm or less can be met at the site elevation and boilers are less than 1,000,000 Btuh.

b. A packaged boiler plant control panel shall sequence the boiler's to provide the required capacity. It also, shall rotate the boilers for equal run time on a time clock schedule. The heating hot water temperature reset shall be accomplished by primary/secondary loop such that return temperatures to boilers are maintained above 120 degrees F.. The primary loop to boilers shall allow full flow through operating boilers at all load times. Lead boiler shall run at outside temperatures below 60 degrees F..

1. Boiler Control

The lead boiler shall be energized in response to a system demand. After an adjustable time delay, to allow the boiler firing sequence to elapse, the controller shall begin modulating the lead burner upward from the ignition starting point at a rate proportional to the system temperature rate of change and gain setting. If the lead boiler should fail the lag boiler shall be energized. The lag boiler shall begin modulating at the ignition start point, after a time delay, and proceed according to system rate of change and gain setting. As the system temperature rises, control shall decrease the modulation of the lag boiler so as not to over shoot the set point.

1.11.1.1 Boiler Connections

Design of boiler connections and auxiliary equipment shall conform to the requirements of ASME Boiler Code.

1.11.1.2 Low-Water Cutoffs

Float-type safety water feeders with low water cutoffs shall be provided for the hot-water boilers.

1.11.1.3 Water Column Connections

Provide crosses at right-angle turns on water column connections to boiler.

1.11.1.4 Smoke Connection

Boiler flue stack connections shall be in accordance with NFPA 211. Also, see paragraph Vents and Stacks.

1.11.1.5 Boiler Flue Termination

The boiler flue shall extend up through the roof of the building. The flue shall be provided with a rain cap fitting.

1.11.1.6 Boiler Location

The boilers and all associated fuel burning equipment shall be located in mechanical/electrical room.

1.11.2 Heating Water Distribution Pumps

The heating water shall be circulated by two parallel base mounted, end-suction, centrifugal pumps with mechanical seals. Each pump shall be sized for 100 percent of the maximum required heating water flow and 100 percent of the maximum system head pressure. The pumps capacity shall be based on a 200 degrees F. supply and 180 degrees F. return water. The pumps shall be non-overloading allowing the pump to operate at any point on its characteristic curve. Each pump shall be provided with a suction diffuser and shall be mounted on a 6-inch thick concrete housekeeping pad. Each pump shall be provided with a calibrated bronze balancing valve (venturi), check valve and shut-off valves. Pumps shall run at outdoor temperatures below 60 degrees F.. If one pump should fail, the other stand-by pump shall start (providing 100% of the full flow capacity). Pumps shall alternate starting and have run-time meters. Pump flow rate (and head loss) shall be corrected for glycol. This corrected flow rate shall be used in selecting all other equipment ie. coils.

a. Pump Control

The boiler circulation pumps shall start and stop with their respective boilers. A flow switch in the heating water return line to each boiler in the production loop shall allow the boiler to fire, only after flow has been established through the boiler. The heating water distribution pumps shall be controlled to run in a lead-lag configuration when the outdoor air temperatures is be below 60 degrees F., so that only the lead pump shall operate.

1.11.3 Expansion Tanks

A floor mounted bladder type expansion tank shall be provided in the heating hot water piping systems. The expansion tank's precharge pressure

and acceptance volume shall be selected based on the design of the piping systems. The STRUCTURAL DESIGN ENGINNER shall be thoroughly consulted before hanging the tank from the structure.

1.11.4 Air Separation Tanks

The heating hot water piping systems shall be provided with an air separation tank. The air separator shall include an automatic air vent and make-up water system, consisting of a pressure reducing valve, strainer, reduced pressure type backflow preventer and isolation valves.

1.11.5 Water Treatment Systems

Provide a mixture of 35% propylene glycol and 65% water into the primary loop of both the heating systems. Provide a shot feeder (chemical feeder) at the heating water distribution pump to allow introduction of chemicals into the system and automatic glycol feeder. Provide the chemical treatment necessary to protect the heating system's equipment from damage due to corrosion and freezing.

1.11.6 Air handling Unit Coils

a. Each air handling unit coil shall be provided with a three-way control valve.

b. Leaving air temperatures for heating coils (except for preheat) shall be between 100 to 105 degrees F..

c. Coils shall be selected with no more than 500 fpm coil face velocity.

1.11.7 Variable Air Volume Box Reheat Coils

Each VAV Box shall be provided with a two or three-way control valve. Leaving air temperatures for reheat coils shall be a minimum of 104 degrees F. at 40% of maximum air flow rate. Each VAV box shall be provided with a volume damper which allows only 40% of the maximum cooling air flow rate - when the box is in the reheat mode..

1.11.8 Piping

All piping shall be pitched up in the direction of flow, 1 inch in 40 feet shall be designed without pockets which would permit accumulation of air, and shall be provided with vents at high points and drains at low points.

1.11.8.1 Pipe Materials

All new heating water piping within the facility shall be black steel conforming to ASTM A53, Schedule 40 or copper.

1.11.8.2 Pipe Joints

Heating water pipe joints shall be of the following types:

a. Heating water piping installed within the facility shall utilize threaded joints or welded joints. Welded joints and fittings shall be used for joints 2-1/2 inch and larger. Copper pipe joints 2 1/2 inch and larger shall be brazed. Grooved mechanical joints shall not be used.

b. Connections to equipment shall utilize unions for pipe 2-inch and

smaller and flanges for pipe 2-1/2 inch and larger.

1.11.8.3 Pipe Expansion

In runs of pipe 50 feet and longer, or in shorter runs where design deems it necessary, indicate size on project drawings the location of all anchors, bends, loops, and pipe guides to adequately limit and provide for pipe expansion. Do not use expansion joints in piping unless absolutely necessary and justified. Anchors and guides shall be indicated on the project drawings and detailed for installation in the building structure provided. The STRUCTURAL DESIGN ENGINEER shall be thoroughly in formed of all forces generated.

1.11.9 Vents and Stacks

Stacks shall be in accordance with NFPA 211. Generally all stacks shall be of the prefabricated type with individual stack provided for each appliance. Stacks are generally used for forced draft applications. Vents shall conform to UL 441 and be Type B or per boiler manufacturer's recommendations. Vents are generally used for atmospheric burners only. Vents can be tied together to a main vent. Combined stacks shall not be used for appliances with power burners or draft fans. Stacks and vents can not be tied together. Height of stacks and vents shall be as required by NFPA 54 and shall be provided with a rain cap.

1.11.10 Heating of Mechanical Equipment Rooms

The mechanical equipment rooms shall be provided with a thermostatically controlled, hot-water, horizontal throw unit heaters to maintain a space temperature of 45 degrees F. minimum. The unit heater airflow shall be directed toward the combustion air intake(s) in order to warm the combustion air.

1.11.11 Combustion Air

The mechanical equipment room shall be provided with combustion air louvers sized and located in accordance with NFPA 54. The combustion air louvers shall be provided without dampers and shall be ducted to within 12 inches of the mechanical room roof (in order to minimize the potential for piping freeze-up in the mechanical room due to combustion air intake). High efficiency boilers shall have combustion air ducted to the units

1.11.12 Not Used

1.11.13 Low Intensity Infrared Radiant Heating

The use of low intensity infrared heating systems shall be provided in the apparatus room to offset natural building heat losses, infiltration and open overhead door losses (use 2 air changes per hour for door openings in apparatus room) and may be provided in breathing apparatus room, disinfection/decon room, fire gear cleaning room, and each fire extinguisher maintenance rooms in lieu of unit heaters. Radiant heat will not be permitted in any of the Office areas or areas with ceilings. High Intensity infrared heating is not permitted. The entire radiant heating system shall meet the requirements of Technical Specification 15565HEATING SYSTEM, GAS-FIRED HEATERS, unless otherwise stated herein.

a. The entire heating system(s) supplied shall be design certified by the American Gas Association. System(s) shall be a gas fired vented low

intensity radiant heating system(s) equipped for and adjusted to burn natural gas. System(s) shall be complete with burners, exhausters, tubular infrared emitters, shields, pre-wired control boxes, thermostats, and reflector and duct hangers. System shall provide sufficient radiant heating surface to attain a minimum steady-state thermal efficiency of 83 percent. After heater reaches operating temperature, all condensation shall cease and moisture shall exit the system in a vapor state.

b. Heaters shall conform to the requirements of ANSI Z83.6 with AGA label and shall be single-burner power vented, single-burner vacuum vented or multiple-burner vacuum vented. Maximum number of burners per exhauster shall be 2 for multiple burner/exhauster parallel or series systems. Each heater shall be provided with a gas pressure regulator that shall satisfactorily limit the main gas burner supply pressure. Heater style shall be tubular type.

c. System(s) shall be supplied ducted air from outside to each burner and end vent for the support of combustion. Intake shall be insulated sheet metal or PVC type as recommended by the heater manufacturer. Sidewall combustion air intakes shall be terminated with a manufacturer supplied intake hood, approved by A.G.A. Laboratories as suitable for each service. Combustion air sheet metal duct shall be provided in place of manufacturer's supplied intake hood with sidewall intakes. Provide and with stainless steel bird screen. Combustion air roof intakes shall not be allowed.

d. Heaters shall be vented to the outside atmosphere and comply with NFPA 54 and NFPA 211. Vent shall be Type 316 stainless steel or high-temperature corrosion-resistant plastic rated for minimum 400 degrees F.. Plastic vents shall be acceptable only if they conform to the manufacturer's recommendations. Direct sidewall venting shall be terminated with a manufacturers supplied discharge vent approved by A.G.A. Laboratories as a suitable horizontal venting means. Provide with stainless steel bird screen. Roof venting shall not be allowed.

1.11.14 Unit Heaters

Thermostatically controlled, hot water unit heaters are permitted in non-administrative areas, disinfection/decon room, breathing apparatus room, fire gear cleaning room, each fire extinguisher maintenance rooms, mezzanine storage, mechanical rooms, and mezzanine void area. Unit heaters shall cycle on and off to maintain setpoint. Suspended ceiling cabinet unit heaters shall be provided near all corridor area exits; main entrance vestibule, near exterior exits. Thermostats shall be wall mounted 60" above finished floor.

1.11.15 Electric Resistance Heating

The use of electric resistance heating is not permitted.

1.12 HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS

This Section contains instructions and engineering requirements relating to the design of the new HVAC supply and distribution systems. The design of all systems shall comply with the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Handbooks, to the requirements of NFPA Standards Nos. 30, 90A, 96, Terminology of HVAC&R and shall meet the requirements of Technical Specification 15895 AIR SUPPLY,

DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEMS. Mechanical ventilation and ventilation requirements for occupants shall provide the minimum outdoor air supply rates for occupants in heated or air-conditioned facilities, or both, required by ASHRAE Ventilation Standard 62. The cooling (ventilation) operation for the Apparatus room shall be based on removal of heat generated in ventilated areas so inside temperature shall not exceed 98.6 degrees F. at design ambient temperature. Air distribution systems shall be designed to prevent infiltration at the anticipated prevailing wind. Design of variable air volume systems shall ensure proper ventilation rates at low and high system air flow by providing constant volume of outside air. Cooling shall be produced by mechanical ventilation and air conditioning. Equipment capacities and flows shall be corrected for altitude on drawings and included in notes on schedules. **The use of gas-fired "unit heaters & air-handling units or furnaces"**is not permitted except HVU-1 (serving the apparatus room, general ventilation vehicle exhaust and carbon monoxide system) may be indoor indirect gas-fired unit. Also, no track vehicle exhaust system is required.

a. Noise Criteria shall be in accordance with the following Noise Criteria unless otherwise indicated as follows:

1.	Equipment rooms	= 60 NC (max)
2.	Administrative/Office areas	= 30 NC (max)
3.	Lobby/Toilets/Corridors	= 40 NC (max)
4.	Conference rooms	= 32 NC (max)
5.	Dining	= 35 NC (max)
6.	Dorms	= 30 NC (max)

1.12.1 System Designs

All spaces in the facility including Communication/radio communication rooms, Electrical/UPS room, shall be heated and cooled by air-conditioning except for interior janitor's closets, areas requiring unit heaters (see paragraph UNIT HEATERS and in apparatus room) and interior storage closets. Vestibules, stairs, etc, shall be heated for freeze protection of sprinklers only (or Mechanical design shall be coordinated with the Fire Sprinkler Installation for freeze protection). Ventilation in rest rooms/lockers, handicapped toilets and janitor's closets shall be for odor exhaust only and shall be interlocked with AHU-1 & AHU-2 respectfully. Unheated or air conditioned closets and storage areas in air-conditioned facilities shall be provided either directly with air conditioned air or provided with exhaust to transfer conditioned air to adjacent spaces. Building shall be maintained at a positive pressure when operating. Excess outside air shall first be relieved through areas generating odors (such as kitchen, toilet rooms & lockers, then through relief system and positive with respect to the apparatus room. Air handling Units, and heating and ventilating units not located in mechanical rooms shall be suspended on platforms or catwalks with perimeter railings for maintenance access. Heating and ventilation for Apparatus room shall be provided by suspended air handing unit(s) in the Apparatus room. Heating and ventilation air for other areas shall be provided by air handling units located at the following locations:

a. Variable air volume unit AHU-1 in Mechanical/Generator Room except dorm rooms shall have fan coil units.
b. Variable air volume unit AHU-2 suspended in mezzanine mechanical room 202.
c. Constant air volume unit HVU-1 suspended in Apparatus room.

1.12.2 Air Handling Units

1.12.2.1 AHU System For "Dorm area"

a. AHU-1 in Mechanical/Generator Room serving the dorms, captain's office, library/crew meeting, Men's & Women's Toilet/Locker Rooms, physical training room, dining room, laundry room, day room, kitchen and other rooms located on the east side of plan shall be a modular type draw thru unit equipped with a glycol hot water pre-heating coil, glycol chilled water cooling coil, packaged electric or gas-fired humidifier and a combination filter/mixing section. An in-line return fan and relief louvered penthouse shall be provided for use of 100 percent outside air ventilation during economizer mode. The mixed air dampers shall modulate to maintain the mixed air temperature set point and the relief air dampers shall modulate to maintain a slightly positive building pressure, in response to the economizer thru the DDC. An intake louver shall be provided on an outside wall and shall be ducted to the top of the AHU mixing box section. The pre-heating operation shall be capable of supplying the minimum outside air required at a constant discharge temperature. Minimum outside air shall be relieved thru toilet/locker exhausts. The VAV air handling unit shall provide a variable volume of primary air, at a constant temperature, to VAV terminal units in the air handling system. The speed of the supply fan shall be modulated by a variable frequency drive to maintain a constant pressure in the air distribution system. Discharge air reset shall be provided. (ie. DAT = 55 degrees F. when RAT is greater than 78 degrees F. and DAT = 65 degrees F. when RAT is less than 70 degrees F. The speed of the return air fan shall also, be modulated by a variable speed drive to track the supply fan and to maintain building at a slightly positive pressure. Air flow stations on the return and supply air ducts to and from the return and supply air fans shall enable the return fan to track the supply fan. An air flow station shall be provided in the outside air duct to the air handling unit filter/mixing section to provide and maintain minimum outside air requirements. Economizer mode shall be disabled at temperatures above high limit and outside air damper returned to minimum position. When the economizer is inactive, the mixed air and relief air dampers shall be at their normal positions, in order to provide the minimum ventilation requirement which is exhausted through the toilet/locker exhausts. Mixed air reset shall also, be provided. The VAV box minimums shall be set to maintain the AHU minimum ventilation rate for a fully occupied facility. During unoccupied hours and warm-up mode, the mixed air dampers shall be positioned for 100 percent recirculation and the relief air damper is closed. Each temperature control zone is to be served by a VAV terminal unit (this is to include each room identified on the Architectural plans to be air-conditioned and heated) which modulates the quantity of primary air supplied to each room with pressure independent controls, to maintain the temperature set point. When the damper in the VAV terminal unit closes to the minimum position, and the room temperature continues to drop, a control valve on the VAV terminal unit glycol reheating coil shall modulate open to maintain the room temperature set point. During the unoccupied and warm-up modes of operation, the VAV terminal unit dampers shall be at minimum position, and the VAV terminal unit heating valves shall be open. The air handling unit supply and return fans cycle to maintain the set back room temperature and to warm-up the rooms to the occupied heating set point during the warm-up mode of operation. See also, sequence of operation in section 15951 DIRECT DIGITAL CONTROL FOR HVAC.

b. AHU-2 suspended in mechanical room (with platforms or catwalks accessible from the apparatus room) or in mezzanine mechanical room 202

serving the Dispatch/911 rooms and Communication/radio communication rooms, Electrical/UPS room, administrative area, break room, etc, shall have the same requirements as AHU-1.

c. Fan Coil Units serving the Dorm rooms: Fan coils shall serve the dorm's rooms only in lieu of VAV boxes. The fan coil unit shall be mounted above the suspended ceiling (if provided). The unit shall be provided with a glycol heating coil, glycol cooling coil, an outside air duct, a motorized outside air damper, a manual outside air balancing damper, a return plenum and supply plenum, if necessary. Fresh air for the room shall be drawn through the unit ducted from the outside and mixed with return air from the room. The unit shall be capable of adequately mixing the outside air and return air in order to provide supply air of uniform temperature regardless of whether the coil is operating. Supply air shall be ducted to one or more supply registers as necessary to provide even heating or cooling within the space. The unit shall be insulated to minimize sound transmission to the room. Piping to and from the unit shall be located above the ceiling. The unit shall be accessed by removing the acoustical ceiling panels. The motorized outside air damper shall be interlocked with the fan so that the damper opens only when the supply fan is running. Programmable thermostats shall be provided.

1.12.2.2 AHU Systems Serving Apparatus Room

HVU-1 suspended in mechanical room or in apparatus room shall be an indirect gas-fired air handling unit. Exhaust fan (EF-4)shall be provided as part of the general ventilation for general ventilation vehicle exhaust system and ventilation of the apparatus room bays. Exhaust fan(s) EF-4 shall operate when HVU-1 operates in the 100% outside air mode. See paragraph VEHICLE EXHAUST SYSTEMS and conceptual drawing sheet.

a. Exhaust fan(EF-4) shall operate for use of 100% outside air ventilation (economizer). The mixed air dampers modulate to maintain the mixed temperature set point and the exhaust air damper modulates to maintain a slightly positive building pressure, in response to the DDC. An intake louver shall be provided on an outside wall and shall be ducted to the top of the HVU mixing box section. The heating operation shall be capable of supplying the minimum outside air required at a constant discharge temperature and shall be selected with no more than 500 fpm coil face velocity. Minimum outside air shall be relieved thru exhaust fan (EF-4) operation. The air handling unit in the apparatus room shall be a single zone constant air volume system. During unoccupied hours and warm-up mode, the mixed air dampers are positioned for 100 percent recirculation and the relief air damper is closed. The air handling unit supply fan cycles to maintain the set back room temperature and to warm-up the room to the occupied heating set point during the warm-up mode of operation.

1) Carbon monoxide detection shall be provided to monitor/control HVAC in the apparatus room. At levels above 25 ppm the HVU-1 shall start and provide 100% outside air and provide an alarm. At carbon monoxide levels below 25 ppm per CO sensors HVU-1 shall return to normal mode of outside air and de-activate alarm. Centralized control panel for CO (carbon monoxide) detection and control shall be an ACME CP-01-01E3R-0420 with four remote sensors No. 01-33AR or equal serving the apparatus room. Separate carbon monoxide detectors shall be provided in all dorm(sleeping rooms)including fire chief's dorm room.

2) Integrated general ventilation vehicle exhaust system shall be provided, providing general ventilation. See paragraph VEHICLE EXHAUST

SYSTEM.

3) Supplemental infrared heating system(s) shall be provided. See paragraph LOW INTENSITY INFARED RADIANT HEATING.

1.12.2.3 Self-Contained Packaged Humidifiers Serving AHU-1 & AHU-2

Unit shall be self-contained electrode steam humidifier. Humidifier assembly shall include a 20-gauge steel cabinet that houses replaceable canister with auto-flush, solenoid fill valve, pressure regulating orifice, and auto control circuit. The humidifier shall be serviceable without disconnecting the high-voltage power supply and shall not interrupt unit operation. Electrode wires shall be connected with quick connect fasteners.

a. Microprocessor control shall maintain humidifier operation through fill and drain cycles based on water conductivity. Overflow and loss of flow protection shall be provided along with a manual drain switch. A capacity adjustment potentiometer shall be provided. A high-water alarm with built-in time delay shall provide an audible and visual indication to change canister. Humidifier shall have full modulating control to provide 0 to 100 percent capacity. It must also provide a gradual increase in amperage in order to avoid undesirable surges of current. Humidifier shall be supplied with a solid state electronic sensor controller (humidistat) capable of fully modulating the steam flow.

b. The humidifier fill waterline shall have an air gap to prevent backflow (or siphoning) of contaminated water into the water supply system. Water fill lines shall also have a water seal between a fill cup and the steam generator to prevent backflow of steam vapor when the drain valve is activated.

c. Humidifier shall incorporate electrical terminals for installation of controlling stat, duct high-limit stat, interlock switch to fan motor and/or to sail switch in duct. Humidifier shall be supplied with a steel steam dispersion-tube which provides uniform steam distribution over the entire tube length and shall be supplied at various lengths to adequately span the widest dimension of the duct. Steam hose from generator to dispersion tube shall be of reinforced rubber to adequately convey steam to the tube and to drain any condensate back to the generator.

d. In lieu of electric, gas-fired humidifiers may be provided.

1.12.3 Filtration

Indoor air quality is of primary concern, the combined supply air, including return and outside air, shall be filtered by a combination of 25 to 30 percent efficient pre-filter(s) and 80 to 85 percent final filter as determined by the dust spot test specified in ASHRAE Standard 52.1.

1.12.4 Ductwork

Supply air duct systems for variable air volume systems shall be sized using the static regain method. Supply air ducts from VAV air handling units to VAV boxes shall be built to at least medium pressure standards and class A seal requirements. All other duct shall be low pressure and built to low pressure and class c seal requirements. Offices and dorm rooms shall be individually zoned. Communication/radio communication rooms, Electrical/UPS room, shall be served by individual fan-powered VAV boxes. All other ductwork shall be sized using the equal friction method with 0.07

inch per 100 feet for supply ducts and 0.1 inch per 100 feet for return and exhaust ducts. Ductwork shall be metal except for fan connections. Ductwork serving Administrative areas shall typically be run above the ceiling in the corridors. Return ductwork shall be used in all air-conditioned areas for all fan-powered VAV boxes ducted back to the respective rooms they serve. There shall be 15 feet of return air duct to an air handling unit provided with acoustical liner 15 feet. This is the minimum amount of return air duct that will be accepted for each air handling unit). Flexible ductwork shall never exceed 6 feet (2 meters) in length.

a. Duct Construction
All ductwork shall be constructed from galvanized sheetmetal, in accordance with SMACNA guidelines.

1.12.5 Variable-Air Volume Boxes

VAV Boxes shall be concealed above ceiling of the controlled space and provide varying amounts of conditioned air in response to a space thermostat. All VAV boxes shall be equipped with a hydronic reheat coil with two or three-way control valve. The minimum heating air volume flow rate shall be set for 40% of the full cooling air flow rate.

1.12.6 Ceiling Mounted Supply Diffusers

Ceiling diffusers shall be suitable for use in a lay-in ceiling or a gyp board ceiling and shall be located as necessary. All new diffusers shall be provided with a 4-way adjustable discharge pattern; standard diffusers with fixed discharge patterns are not permitted. Diffusers shall be sized to distribute the required quantity of air evenly over the space intended without causing noticeable drafts, air movement faster than 50 feet per minute in the occupied zone, or causing dead spots anywhere in the conditioned space. (Maximum velocity of 500 fpm with a NC of 30 maximum). Maximum diffuser size shall be 24"x24".

1.12.7 Ceiling Mounted Return Grilles

Ceiling return air grilles, suitable for use in lay-in ceilings or gyp board ceilings, shall be located as necessary. The maximum size of new return grilles shall be 24"x24". Return grilles shall notbe located close to outdoor openings or in locations where bypassing of supply air may occur. Recommended return air velocities based on free area of the opening shall be 500 fpm.

1.12.8 Supply and Exhaust Fans

Except for wall mounted propeller units, all fans shall be centrifugal type and connected directly to weather-proof louvers using ductwork. Low leakage motorized dampers shall be provided. Fans larger than 2000 cfm in capacity shall be provided with V-belt drives. Care shall be taken to ensure that the noise level generated by exhaust fans and associated relief louvers is not transmitted to the exterior of the building. In-line fans located outside the main mechanical/generator and mechanical/electrical areas shall be the provided with a manufacturers standard acoustical enclosure to inhibit noise transmission to the adjoining occupied spaces. Sone value of fans measured 5 feet from fan inlet shall be less than 30 sones outside the mechanical equipment rooms. Sound transmission data shall be submitted for approval and design shall indicate noise criteria on schedules. Mechanical rooms having a boilers shall be provided with supply

fan for ventilation purposes in lieu of an exhaust fan.

1.12.9 Outdoor Intakes and Exhausts

New outdoor air intakes shall be located in areas where potential for air contamination is lowest, such as away from overhead doors. Maximize the distance between intakes and exhausts by maintaining a minimum distance of 15 feet between intakes and exhausts and 24 feet between intakes and toilet, janitor's closets and etc.. Motorized low-leakage damper with blade and jamb seals, shall be provided at all outside air intake and exhausts at the building's exterior surfaces. If feasible, locate intakes and exhausts on different building faces. Maximum velocity through net area of air intakes shall be limited to 500 fpm. Required air flow shall be corrected for altitude.

1.12.10 Special Requirements

1.12.10.1 Toilets/Locker Rooms

The toilets/lockers shall be exhausted at the rate of:

1) a. 4 air changes per hour for lockers
   b. 2.0 cfm exhaust per sq. foot for toilet area
   c. 2.5 cfm exhaust per sq. foot for shower area

In order to maintain a negative room pressure.

Or

2) The VAV AHU-1 & VAV AHU-2 minimum outside air requirement of 20 cfm outside air per person for the Administrative area of the building evenly exhausted and distributed in both Men's & Women's Toilets/lockers whichever is greater of (1)a,b,and c combined.

The required make-up air for the exhaust system shall be supplied by VAV boxes to supply air for the heating/cooling loads (through VAV air handling unit AHU-1) and through door grilles or transfer ducts (sized for a velocity of 500 fpm.

1.12.10.2 Janitor's Closets

The janitor's closets shall be exhausted at the rate of 2.0 cfm exhaust per sq. foot in order to maintain a negative room pressure. The required make-up air for the exhaust system shall be supplied through a door grille (sized for a velocity of 500 fpm).

1.12.10.3 Mechanical Equipment Rooms

The mechanical equipment rooms including fighting agent storage , breathing apparatus room, disinfection/decon room, and each fire extinguisher maintenance rooms, shall each be ventilated and cooled with outside air by thermostatically controlled fans; set to operate when the respective space temperature exceeds 85 degrees F.. Size of fan shall be based on removal of heat generated in room so inside temperature shall not exceed 98.6 degrees F. at design ambient temperature, but the system design shall not be less than 10 air changes per hour. Sone values of fans measured 5 feet from fan inlet shall be less than 20 Sones.

1.12.10.4 Boiler Room (Mechanical room)

The boiler room shall be ventilated and cooled with outside air at a minimum rate of 20 AC/hr by a thermostatically controlled supply fan set to operate when temperature exceeds 85 degrees F..

1.12.10.5 Laundry Room Exhaust

A 4-inch duct stub out shall be provided for the dryer in the Laundry room. The dryer exhaust ductwork shall not terminate over a walkway or near a door. If necessary, exhaust fans shall be provided as part of the dryer exhaust systems, ie. when travel distance exceeds 20 feet. Alternatively, because of the requirement for only two dryers in the laundry facility and because the dryers are electrically heated, it will not be necessary to directly supply the laundry room with make-up air. A louvered or undercut door or transfer duct (sized for 500 fpm) shall be required to allow for replacement air to the dryers.

1.12.10.6 Not Used

1.12.10.7 General Ventilation Vehicle Exhaust System

The design of all systems shall comply with ASHRAE handbooks and Standards, and to the requirements of NFPA Nos. 30, 90a, 90b, 91, and 1500 and OSHA Standards. Testing shall be done for compliance prior to acceptance of the building. The general ventilation vehicle exhaust system for the fire trucks shall be a general ventilation system that runs all the time, no overhead flexible ducts. The exhaust fan connected to the exhaust ducts shall be provided with make-up air from the HVU-1. This air is then exhausted through EF-4. The building shall be ventilated by drops between adjacent bays that are 18"X18" rectangular metal ducts 2310 cfm each extended down from the overhead common duct to within 41 inches above the floor (with mesh birdscreen over opening), total of six shall be provided. Support of these duct drops shall be made by use of non-load bearing duct support ("columns"). General ventilation shall be sized for a minimum 17,360 cfm and is required. This value is greater then the 1155 cfm per bay exhaust required by each truck as it is parked in all bays. This ventilation system shall be interlocked with the heating and ventilating unit HVU-1 and carbon monoxide (detectors) system provided and required by paragraph AHU SYSTEMS IN APPARATUS ROOM . Four carbon monoxide detectors shall be provided in the apparatus room, 12 inches above the finished floor one on each wall.

1.12.10.8 Communication/radio communication rooms, Electrical/UPS room,

a. Communication/radio communication rooms, Electrical/UPS room, shall be provided with dedicated fan-powered VAV box or boxes and cooled by AHU-1 see paragraph "Air Handling Units" for design conditions, inside design conditions, cooling loads requirements, and minimum ventilation requirements. Supply and return ductwork shall be provided for the room.

b. Dispatch/911 rooms and Communication/radio communication rooms, Electrical/UPS room, shall be provided with dedicated fan-powered VAV box or boxes and cooled by AHU-2 see paragraph "Air Handling Units" for design conditions, inside design conditions, cooling loads requirements, and minimum ventilation requirements. Supply and return ductwork shall be provided for the room.

c. Battery and UPS's area(s) shall conform to the following:

1) The battery area shall be ventilated, by powered ventilation systems to limit hydrogen accumulation to less than an explosive mixture. Failure of a continuously operated or automatically controlled powered ventilation system required by design to limit hydrogen accumulation to less than an explosive mixture shall be annunciated. Each Battery room shall have ventilation, forced ventilation, to keep the flammable hydrogen gas concentration below 2-percent by volume.

2) The power ventilation system for the battery room shall be separate from ventilation systems for other spaces. Air recirculation in the battery room is prohibited.

3) Electrical hazardous areas shall be as indicated in section 01007 ELECTRICAL REQ1UIREMENTS.

4) Each blower shall have a non-sparking fan.

5) When the batteries are arranged in two or more tiers, each shelf shall have at least 2 inches of space front and back for circulation of air. Cell ventilation openings shall not be obstructed.

6) Operational battery areas where batteries are used for emergency power or other operations and recharged regularly shall conform to the following:

a. When a battery is being recharged, it produces approximately 0.016 cubic foot per hour of hydrogen gas per ampere per cell.

b. Maximum charging current of battery charger(s) =
Maximum number of batteries to be charged at any given time =
Number of cells per battery =
Maximum battery capacity in ampere-hours =

c. The amount of ventilation air required for the room shall be in accordance with the following formula:

$$Q = (0.016 \times I \times N / C \times K)$$

Where: Q = Required ventilation rate in cubic foot per hour.

I = 0.21 x (Capacity of the largest battery to be charged in ampere-hours) or 0.25 x (The maximum obtainable amperes from the charger), whichever is greater.

N = (Number of batteries to be recharged at one time) x (Number of cells per battery). A single cell normally has 2 DC volts. A 12-volts battery usually has six cells connected in series. A typical 6-volts battery has three cells.

C = Allowable concentration of hydrogen gas, 0.02.

K = Safety Factor to allow for complete mixing, use 4.

EXAMPLE: A battery room has twenty 12-volts DC batteries. Each battery has 10 ampere=hours capacity and 6 cells. The room is equipped with a battery charger having 50 amperes maximum obtainable current. The current I should be the greater of the two numbers 0.21 x 10 = 2.1 and 50 / 4 = 12.5 which is 12.5 amperes. The number of cells N is 20 x 6 = 120, so the minimum ventilation rate required for this room is (0.016 x 12 / 5 x 120 / 0.02) x 4 = 4800 cubic foot per hour.

DESIGN INFORMATION REQUIRED:

Capacity of the largest battery to be charged in ampere-hours = MAF 720, LF 600 battery model
Number of batteries to be recharged at one time = 60
Maximum obtainable amperes from the charger = 150
Number of chargers = 8
Number of cells = 8

NOTE: COMPARE THE Q VALUE OBTAINED WITH 4 AC/HR, AND USE THE LARGEST VALUE.

7. The power ventilation system shall be interlocked with the battery charger(s) so that the battery cannot be charged without ventilation.

8. Multiple speed fans should be considered when two or more battery chargers are used in a room.

1.13 CHILLED WATER SYSTEMS

These systems shall meet the requirements of Technical Specification 15181 CHILLED WATER AND CONDENSER WATER PIPING AND ACCESSORIES and 15620 LIQUID CHILLERS unless otherwise stated, shall comply with the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Handbooks and ASHRAE 15.

a. Each air handling unit coil shall be provided with a three-way control valve.
b. Coils shall be selected with no more than 500 FPM coil face velocity.

1.13.1 Refrigeration System.

The refrigeration system shall be a split system consisting of an exterior 6-inch thick pad-mounted air-cooled condensing unit (Minimum EER = 10.0) and liquid cooler (evaporator) located in the mechanical room. Outside units shall be provided with manufacturer's standard packaged controls. DX evaporators shall be provided with double suction risers where suction line is trapped or rises above the evaporator. The condensing unit (with hail guard) shall be provided with at least four steps of capacity reduction. Refrigeration equipment provided shall have an ozone depletion factor of 0.05 or less. HCFC-22 shall not be allowed. HCFC-22 alternatives shall be documented in the design analysis and catalog cuts provided for three manufacturer's before an alternate refrigerant equipment will be allowed. Where applicable in lieu of air-cooled condensing unit specify screw type compressors for new construction projects when applicable. Additionally, need to assure that vibration dampening is installed where needed. Low ambient operation shall be provided for to 45 degrees F..

1.13.2 Not Used.

1.13.3 Other Systems

The use of evaporative cooling, heat pump and dx coil type systems will not be permitted.

1.13.4 Chilled Water Distribution Pumps

The cooling water shall be circulated by two base mounted, end-suction, centrifugal pumps with mechanical seals. Each pump shall be sized for 100 percent of the maximum required cooling water flow and 100 percent of the maximum system head pressure. The pumps capacity shall be based on a 55 degrees F. return and 45 degrees F. supply water. The pumps shall be non-overloading allowing the pump to operate at any point on its characteristic curve. Each pump shall be provided with a suction diffuser and mounted on a 6-inch thick concrete housekeeping pad. Each pump shall be provided with a calibrated bronze balancing valve (venturi), check valve and shut-off valves. Pumps shall run at temperature above 65 degrees F. (adjustable). If one pump should fail, the other stand-by pump shall start providing 100% of the full flow capacity. Pumps shall alternate starting and have run-time meters. Pump flow rate (and head loss) shall be corrected for glycol. This corrected flow rate shall be used in selecting all other equipment ie. coils.

a. Pump Control

A flow switch in the cooling water return line to each evaporator in the production loop shall allow the condensing unit to energize, only after flow has been established through the evaporator. The cooling water distribution pumps shall be controlled to run in a lead-lag configuration when the outdoor air temperatures is be above 65 degrees F., so that only the lead pump will operate.

b. Hydronic Accessories:

1. Expansion Tanks

A floor mounted bladder type expansion tank shall be provided in the chilled water piping systems. The expansion tank's precharge pressure and acceptance volume shall be selected based on the layout of the piping systems. The STRUCTURAL DESIGN ENGINNER shall be thoroughly consulted before hanging the tank from the structure.

2. Air Separation Tanks

The chilled water piping systems shall be provided with an air separation tank. The air separators shall include an automatic air vent and make-up water system, consisting of a pressure reducing valve, strainer, reduced pressure type backflow preventer and isolation valves.

3. Water Treatment Systems

Provide a mixture of 35% propylene glycol and 65% water into the primary loop of the cooling systems. Provide a shot feeder (chemical feeder) at the cooling water distribution pumps to allow introduction of chemicals into the system and automatic glycol feeder. Provide the chemical treatment necessary to protect the cooling system's equipment from damage due to corrosion and freezing.

4. Air handling Unit Coils

Each air handling unit coil shall be provided with a three-way control valve.

5. Piping

All piping shall be pitched up in the direction of flow, 1 inch in 40

feet shall be designed without pockets which would permit accumulation of air, and shall be provided with vents at high points and drains at low points.

6. Pipe Materials

All new cooling water piping within the facility shall be black steel conforming to ASTM A53, Schedule 40 or copper.

7. Pipe Joints

Cooling water pipe joints shall be of the following types:

a. Chilled water piping installed within the facility shall utilize threaded joints or welded joints. Welded joints and fittings shall be used for joints 2-1/2" and larger. Copper pipe joints 2 1/2 inch and larger shall be brazed. Grooved mechanical joints shall not be used.

b. Connections to equipment shall utilize unions for pipe 2" and smaller and flanges for pipe 2-1/2" and larger.

8. Pipe Expansion

In runs of pipe 50 feet and longer, or in shorter runs where required, indicate size on project drawings the location of all anchors, bends, loops, and pipe guides to adequately limit and provide for pipe expansion. Do not use expansion joints in piping unless absolutely necessary and justified. Anchors and guides shall be indicated on the project drawings and detailed for installation in the building structure provided. The STRUCTURAL DESIGN ENGINEER shall be thoroughly in formed of all forces generated.

1.14 BUILDING TEMPERATURE CONTROL SYSTEMS

This Section contains instructions and engineering requirements for the design of the new building temperature control systems required for the operation of the building mechanical systems. The temperature controls shall be Williams Electric Company temperature controls and UCS system by the Contractor and coordinated with the existing EMCS provider. All DDC functions in the HVAC system shall be controlled and monitored by the EMCS. The design of the control systems for the HVAC equipment shall be in accordance with Technical Specification 15951 DIRECT DIGITAL CONTROL FOR HVAC. Williams Electric Company shall re-program the head-end computer to accommodate the facility and provide equipment and services, including software database programming, graphics generation, calibration and end-to-end testing of the head-end computer and this project's remote DDC panels, and temperature control panels. EMCS fiber shall be extended in accordance with Section 01007 ELECTRICAL REQUIREMENTS as attached. The control system shall be designed to provide continuous and automatic control of all HVAC equipment. Where equipment is provided with a packaged control system, such as in the case of a boilers or chillers, the building control systems shall interface with the equipment's packaged control systems. The temperature control panels shall be located in the mechanical room(s). The number of control panels shall be dictated by the number of and types of equipment in the final design. This type of control system(s) allows an EMCS operator to easily adjust setpoint, operating times and other system parameters, if and when necessary, after the building has been occupied.

a. Notwithstanding Section 00700 Contract Clauses FAR 52.236-5, Material and Workmanship, for the DDC/EMCS shall be manufactured by Williams Electric Company. No other product will be acceptable. The competition Advocate authorizes sole source procurement.

1.14.1 General DDC Requirements

All mechanical systems and equipment, shall be controlled by local direct digital control (DDC) panel(s) located in each facility Mechanical room(s). One EMCS panel shall be provided in the facility. The DDC panel(s) shall operate in a stand alone fashion. A Williams Electric Company temperatures control and UCS design shall be provided, using Technical Specification Section 15951 DIRECT DIGITAL CONTROL FOR HVAC as attached. To facilitate maintenance and to allow manual starting and stopping of equipment by maintenance personnel, a hard-wired Hand-Off-Automatic (HOA) control switch shall be provided for each new major piece of equipment (air handling unit, pump, exhaust fan, etc.) in order to override the automatic DDC start and stop functions. Coordination with and input from the Base, and existing facility User has been required in order to ensure that the appropriate system points are monitored.

a. Fire alarm condition on any fire alarm circuit shall automatically initiate the deactivation of the air handling units throughout the building.

b. All computing devices, shall be as defined in FCC Rules and Regulations FCC Part 15, and shall be certified to comply with the requirements for Class A computing devices and labeled as set forth in FCC Rules and Regulations FCC Part 15.

c. Temperature Control Contractor Experience - The temperature control Contractor shall have a working knowledge of existing system and experience installing these systems. The Contractor shall provide for approval the names and qualification of supervisory personnel (ie. Project Manager and /or Superintendent) that will be used on this project. The Contractor shall also provide a list of references to be contacted from recent projects on which the proposed personnel performed similar duties. Approval shall be based on previous experience with the existing EMCS system, qualifications and demonstrated ability of proposed personnel to manage resources in an efficient and effective manner. Experience and supervisory personnel qualifications must be submitted and approved before submittal of any technical data.

d. Emergency Service - The Government will initiate service calls when the installed DDC/EMCS is not functioning properly. Qualified personnel shall be available to provide service to the complete DDC/EMCS installed under this project. Qualified personnel shall be defined as a factory trained journeyman in the brand of control system provided, this level of training shall be considered a minimum. The Government shall be furnished with a telephone number where the service supervisor can be reached at all times. Service personnel shall be at the site within 8 hours after receiving a request for service. The control system shall be restored to proper operating condition within 3 calendar days after receiving a request for service.

e. Software - The Contractor shall provide all software updates and verify operation in the system. These updates shall be accomplished in a timely manner, fully coordinated with base operators, and shall be incorporated into the operations and maintenance manuals, and software documentation

provided as submittals in section 15951. There shall be at least one scheduled update near the end of the first year's warranty period, at which time the Contractor shall install and validate the latest released version of the Contractor's software.

f. All utility meters shall be connected to the existing EMCS system to allow the necessary monitoring.

g. Fuses shall not be used for surge protection.

h. System descriptions and analyses submittal shall include "and shall indicate how new system will interface with the existing Fort's EMCS as manufactured by Williams Electric Company"

i. Scheduled inspections shall be at the beginning of construction.

j. Temperature sensors for the DDC controllers shall be selected to be standard Platinum 100 Ohm elements which would permit their use with electronic or DDC controls from other sources of supply. Other readily available control devices or standard commercial grade control devices as normally sold by the major temperature controls companies and necessary for control system operation shall be specified.

1.14.2 Existing Williams Electric Company EMCS Interface

The control system serving the facility shall be a system expansion of, and sourced to match, the existing Fort's EMCS. All services, materials, equipment, hardware, and software necessary to install the EMCS expansion and for interfacing to the existing system shall be provided. At the completion of the system expansion, all the new control panels and input and output control points/devices shall be fully integrated into the existing system.

a. Operator Access

Access to the system expansion by the Fort's EMCS operators shall be seamless via the existing work stations on the EMCS LAN and the expansion connections to it. That is, it shall require no different hardware or software or operation steps to access than any of the control panels on the existing system. System expansion access shall allow an EMCS operator to perform the following real-time functions on the new equipment using the same work stations and software required for accessing the existing EMCS:

1. Display the status of all inputs.

2. Display and manually change the status of all outputs.

3. Display and adjust all control loop and all other permanent (battery-backed RAM and/or EEPROM-based) database parameters.

b. Graphic Screens

Provide and integrate graphic display screen files into the existing system, each consisting of a schematic diagram of a mechanical system with real-time statuses of new inputs and outputs superimposed upon the schematic diagram. In conjunction with existing software base packages, the screens shall allow an operator to not only view, but also command changes to the statuses of all outputs.

c. Alarm Monitoring

Alarm monitoring shall be provided for all major pieces of equipment. Indication of failure shall alarm at the existing EMCS Operators Work station. The maximum allowable time for the EMCS to display an alarm condition is 10 seconds starting from the time the alarm condition first exists. The maximum allowable time for equipment to respond to manual EMCS commands is 10 seconds starting from the time the command is initiated at the work station. The system expansion shall not impede the capabilities of the EMCS to meet these requirements. Alarm monitoring shall include, but not be limited to the following alarm indications:

Loss of flow
High and low temperature
High and low humidity
Loss of commercial power
High and low pressure
Freeze detection
Summary alarm
Start/stop actual status different from commanded state
Carbon monoxide sensors
Smoke detectors
Filter pressure differential gauges

Each start/stop is to be paired with a true status input. EMCS alarms shall be generated whenever the status input state varies (longer than some adjustable time delay) from the corresponding output's matching state.

1.14.2.1 Not Used

1.14.2.2 Controllers

Except in the case of application specific controllers (ACS), All modulating mechanical processes (e.g., temperature, pressure, flow control) shall be controlled directly by the local DDC control panel. Except for safety and protection functions, software logic shall be used in lieu of relay logic. The contacts of safety and protection function instruments shall be hardwired in series with the common side of each equipment's HOA switch, and their proper operation shall not depend in any way upon the DDC.

1.14.2.3 Digital Controllers

Digital controller blocks or points within the control panels shall utilize a full proportional algorithm. Digital controller blocks or points within the control panels shall utilize a full proportional-integral-derivative (PID) algorithm which can provide the following combinations of control modes: P, PI, PD, and PID. Controllers shall eliminate integral windup when controlled equipment is shutdown. Provide remote adjustment capabilities for the following parameters via the normal existing EMCS operator interface:

a. Input manual/automatic.
b. Input value in engineering units (when in manual).
c. Proportional, integral, and derivative gains.
d. Direct/reverse action.
e. Output manual/automatic.
f. Output value in percent of full output range (when in manual).
g. Anti-windup initiation.

1.14.2.4 Stand-Alone Operation

The local control panels, although fully integrated into the existing EMCS network, shall be capable of stand-alone operation in the event of a complete failure of the network. When communication is lost with the network, local programs, including those based upon real-time clock or calendar events, shall continue to function without operator intervention. "Local" or "non-global" programs are considered to be those which are not dependent upon multiple controllers for either input information or output actuation. A program which requires a shared input, or "global" value, communicated over the network from another controller (e.g., a boiler temperature reset based on outside air temperature) shall continue to operate with the last valid value received prior to a loss of communication.

1.14.3 Input/Output Devices

The control system shall utilize off-the-shelf input and output instruments (e.g., RTD sensors, actuators, relays) which are commercially available from third party vendors and who are independent from the DDC panel manufacturers.

1.14.4 Analog Sensors, Digital inputs & Digital outputs

All sensing devices shall be capable of removal from the system without disruption of service to the system in which they are installed. Sensors, digital inputs and outputs provided shall include, but not limited to, the following:

Supply air, return air, & outside air; Air Flow Measuring Stations (to be shown on mechanical HVAC drawings)
Boiler inlet temperature
Boiler outlet temperature
Boiler fuel flow
Boiler water reset
Heating water flow
Chilled water flow
Chilled water inlet temperature
Chilled water outlet temperature
Space temperature(s) (to be shown on mechanical HVAC drawings)
Outside air temperature sensors (to be shown on HVAC mechanical drawings)
Mixed air temperature sensors (to be shown on HVAC mechanical drawings)
Discharge air temperature sensors
Preheating Coil Controls
Heating Coil Controls
Chilled water Cooling Coil Controls
Hot water pump(s) status
Hot water pump(s) start/stop
Chilled water pump(s) status
Chilled water pump(s) start/stop
Air handling unit(s) status
Air handling unit(s) start/stop
Return air fan(s) status
Return air fan(s) start/stop
Kilowatt meter
Gas meter
Water meter
HVU-1:
D-1 outside air damper start/stop

D-2 return air damper start/stop
Supply fan
Gas burner control
Discharge air average temperature (TSA) control
Space temperature status
EF-4 status
Fan Coil/Blower coil units Cooling Coil Controls
Fan Coil/blower coil units start/stop
Fan Coil/blower coil units status

Liquid flow measurement for use by the DDC system shall be performed by paddlewheel-type flow sensors only. Pitot-type sensing elements may be installed for local instrumentation used for testing and balancing purposes only.

1.14.5 Cable and Wiring

Cable and wire for the DDC system shall be separate from the distribution system serving any other system. All cable and wiring shall be installed in conduit. The data transmission media (DTM) shall be provided by the Contractor. DTM shall be as specified and extended as shown on the electrical drawings in accordance with section 01007 ELECTRICAL REQUIREMENTS.

1.14.6 Control Valves

Sizing of control valves shall take into account upstream and downstream fittings and shall be in accordance with Instrument Society of America standard ISA S75.01-1985.

1.14.7 Variable Air Volume Boxes

VAV boxes shall be fitted with DDC controllers and velocity sensors compatible with the existing EMCS. VAV box temperature sensors shall be located atop an associated return grille and be provided with 30 feet of sensor wire for future relocations. Where VAV air handling units with VAV boxes are provided, flow monitoring stations shall be provided to ensure proper indoor air quality when operating at minimum supply air flows.

1.14.8 Damper Actuators

All dampers shall be provided with 4-20 mA-operated damper actuators.

1.14.9 Valve Actuators

All valves shall be provided with 4-20 mA-operated valve actuators.

1.14.10 HVAC Control Drawings

HVAC control drawings, for both the 60 percent and Final submittals, shall be in accordance with SECTION 01336 - 60 PERCENT DESIGN REQUIREMENTS, & SECTION 01338 - 100 PERCENT DESIGN REQUIREMENTS. Control drawings for each facility shall include a system schematic section, an elementary (ladder) diagram, a detailed sequence of control, a list of required components with a brief description of each component, a control panel detail, legend and schedules, a listing of input and output points and a matrix showing the point type, alarms and applications programs associated with each of the input or output points. EMCS details and points to be monitored shall be detailed on the contract drawings and follow the conventions as set forth in AFM 88-36. System I/O summaries shall be detailed.

1.14.11 Control Schematic

The control schematic shall be a schematic representation of the HVAC system and the associated control equipment. The control schematic shall be drawn to a large scale to allow for ample space to indicate any necessary performance parameters such as setpoint, etc.. The control schematic shall be cross referenced to the elementary diagram and the control panel detail by numbered terminal points. Each component shall be identified by a unique alpha-numeric designator such as S1 for sensor number 1. This provides a means of cross referencing to the description of components and the sequence of control. All major control items relative to the system shall be shown. This shall include, but shall not be limited to:

Supply Fans
Exhaust Fans
Filters
Cooling Coils
Heating Coils
Pressure Sensors/Switches
Flow Sensors/Switches
Freezestats w/manual reset
Smoke Detectors w/connection to the FACP
Temperature Sensors
Valves and Valve Actuators
Dampers and Damper Actuators
VAV Boxes
Humidifiers
Gas Valves & actuators
Fan Coils/Blower coil units

1.14.12 Elementary Diagram

An elementary diagram or diagrams shall be provided showing the wiring of the control system devices. It shall be drawn to a large scale for easy reading and to allow space for indicating performance parameters. The elementary diagram shall be cross referenced to the control schematic and the control panel detail through the use of numbered terminal points.

1.14.13 Sequence of Control

The sequence of control is a written statement of the operation of the system. It should be as detailed and complete as possible and it should refer to individual components by their alpha-numeric designator whenever possible. The sequence shall break the overall system into sub-systems, such as supply fan control, humidification, dehumidification, mixed air control, pre-heating coil, heating coil control, cooling coil control, etc., and shall describe the operation of each of the subsystems. The sequence of control shall also describe the operation of all safety devices such as smoke detectors or freezestats, fire alarm interlock and shall describe the operation of the system in both the occupied, warm-up and unoccupied modes.

1.14.14 Description of Components

The description of components shall provide a generic description of the performance of each component. The components shall be referred to by their alpha-numeric designator.

1.14.15 Control Panel Detail

The control panel detail shall show the intended mounting location of any devices that are to be located in the control panel or on the front face of the panel. All field sensors and controls shall be connected to DDC panels to provide ease of diagnosis and repair of the system components. Control panels locations shall be shown on mechanical drawings.

1.14.16 Legends and Schedules

The legend shall provide a definition of all symbols used in the control drawings. Schedules shall provide all necessary information to clarify the operation of the components or the overall system.

1.15 TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS

Testing, adjusting, and balancing required by SECTION 15990 TESTING, ADJUSTING AND BALANCING OF HVAC SYSTEMS shall be complete, including all test and inspection reports, before starting the EMCS Field Test.

1.16 TECHNICAL SPECIFICATIONS

Government provided Corps of Engineers (UFGS) technical guide specifications (available to the Design-Build Contractor as indicated in Section 01332,DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES) shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product and installation requirements for the facility. The specifications shall be edited in accordance with the designer notes associated with each specification and with the Specification Requirements (Division 01 General Requirement Specifications). In case of a conflict, the criteria found in the Specification Requirements (Division 01 General Requirement Specifications) shall take precedence. The provided specifications define the minimum requirements for items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals and testing that shall be provided for the facility. Where items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals or testing requirements are not specified in the provided specifications, special paragraphs within each applicable guide specification shall be prepared to specify those items. Specific items of equipment identified in the provided specifications but not required for the facility shall be edited out.

The SECTION 15951DIRECT DIGITAL CONTROL FOR HVAC and 02556 GAS DISTRIBUTION has been edited completely for this project and is to be considered as an extension of the Specification Requirements.

1.17 ENERGY USE BUDGET (EUB) COMPLIANCE CHECK

Design energy Usage (DEU)estimates shall be calculated for the new building to verify compliance with EUB in accordance with 10 CFR, Subpart A, Part 435, ASHRAE/IESNA 90.1; and the Energy Policy Act of 1992 and 2003. Energy Usage Budget shall be done with and without process loads. Values indicated below shall be the maximum EUB target allowed. DEU shall be less than Energy Usage (EUB) target values indicated in Table I.

Table I
Energy Usage Budget Target For This Project.

Building	Type	Region		EUB Target	Days/Week
Fire Station	H	6	**	60,000 Btuh/sq. ft./yr.	24/7

** Those buildings EUB designated with ** shall be provided using a computer-based program.

M = Million

1.17.1 Computer Simulation

The Energy Usage Budgets shall be calculated using a computer simulation. Method used must take into account the constantly changing temperatures, sun loads, etc., through a year's operation. Use of the program "BLAST" is encouraged. If "BLAST" is used, the "REVIEW SUMMARY REPORT" shall be included in the output report. Any program other than Building Load Analysis and Systems Thermodynamics "BLAST","TRANE TRACE 600",Carriers' latest version, DOE 2.1.E or BESA (Canada) requires prior approval for use. Request for use must demonstrate compliance with the following:

1.17.1.1 Acceptable Engineering Procedures

The energy analysis and building simulation will use a computer program which is based on acceptable engineering procedures. Load calculations and the systems simulation will be on an hourly basis for 12 to 365 days. Although hourly data for 365 days is preferred, a minimum of 12 model days (a statistically average day per month) is acceptable. If calculations are based on less than 365 days, the weather data selected for these days will be statistically derived.

1.17.1.2 Capable of Change

The computer program must be capable of changing the various cooling and heating loads and the thermostat settings to simulate building operations and to simulate deadband and deck/coil reset control strategies.

1.17.1.3 Cooling and Heating Loads Influencing the Building Design

The program must consider all cooling and heating loads which influence the building design. These include solar, outside air, people, lighting, equipment, etc., as well as taking into account the thermal time lag of materials.

1.17.1.4 Alternatives

Some of the alternatives that the program should be capable of analyzing include:

a. Orientation of Building.

b. Wall and roof construction and insulation.

c. Dimensions of Building.

d. Window area, solar shielding, tinted, and single or multiple glazed windows.

e. Types of fuel.

f. Central heating versus individual systems.

g. Type of equipment.

h. Type of mechanical systems, e.g., Constant/Variable volume, single zone/multizone.

i. Type of lighting systems, e.g., standard incandescent or fluorescent and low wattage, high output lighting systems.

1.17.2 EUB

1.17.2 Varying Fuel Escalation Rates.

Use Industrial rates in Federal Register/Volume. 46, No. 222.

1.17.3 Summary Report

Provide a summary section in the separate energy analysis report and results in the design analysis. Include all input data such as U values, design temperatures, hours of operation, building population and size, etc. Include output data such as distribution percentages (lighting, heating, cooling, fan,domestic water heating, etc.).

1.18 TRAINING

Training courses shall be conducted for 10 operating staff members designated by the Contracting Officer in the maintenance and operation of all mechanical systems. Two-week notice shall be given the Contracting Officer for start of training. A training day is defined as 8 hours of classroom instruction, including breaks and lunchtime, Monday through Friday, during the daytime shift in effect at the training facility. For guidance in planning the required instruction, the Contractor shall assume that the attendees will have a high school education or equivalent, and are familiar with the systems. No training shall be scheduled until training manuals and O&M manuals have been approved by the Government. A minimum of 10 O&M manuals shall be provided for the instructions and 4 manuals for each facility shall be given to the Contracting Officier to turnover to the Base Civil Engineer.

1.18.1 Training Course Content

The courses shall be taught at the project site for a period of 1 training days. The training courses shall cover all the material contained in the Operating and Maintenance Instructions, and O&M manuals the layout and location of each system and shall include the following for each system:

a. Troubleshooting
b. Diagnostics
c. Calibration
d. Adjustment

e. Commissioning
f. Repair procedures

(1) Typical systems and similar systems may be treated as a group, with instruction on the physical layout of one such system. The results of the performance verification tests and the calibration,adjustment and commissioning reports shall be presented as benchmarks of the system(s) performance by which to measure operation and maintenance effectiveness.

1.19 NOT USED

1.20 NOT USED

1.21 COMMISSIONING OF HVAC SYSTEMS

This section contains instructions and engineering information relating to the commissioning of HVAC systems, including the precommissioning checks and functional performance tests. Commissioning shall begin only after all work required in paragraphs entitled "Testing, Adjusting, and Balancing of HVAC Systems" and the "Temperature Controls System" have been successfully completed, and all test and inspection reports and operation and maintenance manuals required in other Section's specifications have been submitted and approved. The commissioning of HVAC systems shall meet the requirements of Technical Specification 15995 COMMISSIONING OF HVAC.

a. Pre-commissioning Checks shall be performed for each item of mechanical equipment. Deficiencies discovered during these checks shall be corrected and retested prior to start of the Functional Performance Tests.

b. Functional Performance Tests shall be performed for each equipment item. Functional performance tests shall begin only after all pre-commissioning checks have been successfully completed.

c. Commissioning of HVAC systems shall begin only after all work required in related sections, including Sections HVAC Control Systems and TAB of HVAC Systems has been successfully completed. All test and inspection reports and O&M manuals shall be submitted and approved before commissioning is conducted.

1.22 FOOD SERVICE EQUIPMENT

This section contains instructions and engineering requirements relating to the design of the Food Service Equipment. Food Service Equipment shall comply with local health standards, NSF, AGAL, and UL and shall meet the requirements of Technical Specification 11400. Design Agent shall coordinate with section 01010 KITCHEN EQUIPMENT REQUIREMENTS and with Section 01007 ELECTRICAL REQUIREMENTS. These are the actual equipments requirements and shall form the basis for editing of specification section \=11400=\ for the contract documents.

a. Separate Reach-in Refrigerators GFGI.

Provide 1- 22 cubic feet reach-in refrigerator and 1-22 cubic feet reach-in freezer each with 2 sections located in Kitchen:

Two-section reach-in refrigerator, with self-contained, lockable, top or bottom mounted (R-134a) refrigerator system designed to maintain 35 degree F. in a 90 degree F surroundings. Exterior finish shall be non-stainless steel for cabinet front and door panels. Cabinet interior shall be of aluminum. Cabinet sides shall be aluminum. Cabinet insulation shall be 2 1/2 inch foam-in-place polyurethane foam. Solid door insulation shall be 1 3/4 inch foamed-in-place. shall be furnished with full length height solid doors; Furnish with six steel shelves in each section. Provide 6-inch stainless steel legs.

Refrigeration system shall be expansion valve type with exterior digital thermometer and power "on" light. Power shall be 115/60/1 phase.

The following standard features shall be provided:

Energy Saving Defogger Control
Exterior LCD Digital Thermometer
Self-Closing Doors with Stay/Open Feature at 120 degrees F.
Cam Lift Guide Hinges - Guaranteed for Life
Automatically Activated Interior Lighting
Magnetic Door Gaskets
Horizontal Work Flow Door Handle - Guaranteed for Life
Automatic Condensate Evaporator
Locks
Cord Set Attached
Stainless Steel Breaker Caps

With the following Accessories:

Additional four-year Compressor Warranty

b. Separate Reach-in Freezers GFGI.

Two-section reach-in freezer, with self-contained, lockable, top mounted (R-404a) refrigerator system shall be designed to maintain 0 degree F. in a 95 degree F. surroundings. Exterior finish shall be non-stainless steel for cabinet front and door panels. Cabinet interior shall be of aluminum. Cabinet sides shall be aluminum. Cabinet insulation shall be 2 1/2 inch (foam-in-place polyurethane foam. Solid door insulation shall be 1 3/4 inch foamed-in-place. shall be furnished with full length height solid doors; Furnish with six steel shelves in each section. Provide 6-inch stainless steel legs.

Refrigeration system shall be expansion valve type with exterior digital thermometer and power "on" light. Power shall be 115/60/1 phase.

The following standard features shall be provided:

Energy Saving Defogger Control
Exterior LCD Digital Thermometer
Self-Closing Doors with Stay/Open Feature at 120 degrees F.
Cam Lift Guide Hinges - Guaranteed for Life
Automatically Activated Interior Lighting
Magnetic Door Gaskets
Horizontal Work Flow Door Handle - Guaranteed for Life

Automatic Condensate Evaporator
Locks
Cord Set Attached
Stainless Steel Breaker Caps

With the following Accessories:

Additional four-year Compressor Warranty

b. Ice Making Machine

Provide ice making machine in Kitchen. Ice making machine shall be a cube type, air-cooled, ice maker with an Air Conditioning and Refrigeration Institute certified production capacity of 243 lbs. of ice per 24 hours (and 100 lbs. of built-in storage) at 90 degrees F. air and 70 degrees F. water temperature in accordance with ARI Standard 810-91. Refrigerant shall be R-134a. Ice making machine shall have stainless steel exterior panels. Ice making machine shall measure overall 24"x39"x24". Ice making machine shall produce rhombold shaped cubes measuring 1/4"x1/4"x1/4". Ice making machine shall have an ice thickness control to assure uniform ice thickness without using pressure controls and thermostats or requiring adjustments for fluctuation in air or water temperatures with electro-mechanical control on front of unit. The vertical evaporator shall be vertical and ice shall be harvested by gravity without mechanical assistance. Each ice making machine shall have an air cooled condenser and shall be wired 208-60-3 phase. Front louvers no side or back clearance required.

Ice making machine shall be mounted on ARI certified ice bin which shall be rated in accordance with ARI Standard 820-88 as having a storage capacity of 243 lbs.. Ice bin shall be by the same manufacturer as the ice maker. Ice bin liner shall be seamless polyethylene. Overall size of the ice bin shall match ice maker machine requirements of the manufacturer. Ice bin shall be furnished with stainless steel exterior finish to match ice maker and shall be mounted on 6.5" high stainless steel legs with adjustable feet. Ice maker shall be mounted to the top of the ice bin in accordance with the manufacturer's recommendations. The bin shall be equipped with stainless steel adapters to mount 24" ice machine. Ice making machine shall be equipped with the manufacturer's standard equipment.

c. Kitchen Sink

Kitchen sink shall conform to requirements of NSF No. 2. Sinks shall be constructed of minimum 14-gauge stainless steel. Sink shall be double basin and provided for sprayer attachment. Faucet shall be 8-inch swivel spout with index handled lever handles and comply with NSF 61 section 9.

d. Full-Size Gas Range

Provide full-size gas range with integral oven in Kitchen. Oven to be 36" gas range sealed-top with six burners. Exterior finish shall be stainless steel, with 10" high backguard with slotted black enameled angled cap. Oven door liner, side and rear linings shall be porcelain enameled, with contoured front stainless steel plate rail. Oven shall have a minimum of four-position rack supports and shall be furnished with two racks. Oven compartment and door shall be fully insulated. Oven shall be provided with 6-inch adjustable legs. Shall be provided

with six all purpose tubular heating elements, energy regulator switch controlled. With additional set of four casters. Overall dimensions 36" wide x 373/4" height x 34.36" deep. Power requirements 208/60/1 phase or 3 phase.

e. Undercounter Dishwashers

Provide undercounter dishwashers in Kitchen as indicated. Dishwasher to be single tank, manually fed, spray type, stationary rack, automatically controlled, electrically heated, commercial machine. The dishwasher shall be capable of handling 20" x 20" nominal size racks at a minimum rate of 30 racks per hour when operating with 140 degrees F. wash water temperature and 180 degree F. final rinse water temperature. The dishwasher shall be designed for undercounter use, and be provided with labyrinth type door design. Tank wash chamber, frame, door, upper and lower spray wash and rinse assemblies, scrap collection and straining devices shall be of 18-8 304 stainless steel. Wash tank shall be filled automatically from 180 degree F. rinse water supply. The tank shall be equipped with a built-in electric booster heater to maintain the required wash temperature as well as heating incoming water to 180 degrees F.. Tank shall have drain and overflow provisions as standard with the manufacturer. The wash, dwell and rinse cycles shall be automatic timed operation. Two minute totally automatic cycle shall include, automatic fill, automatic start, automatic pumped drain for both floor and wall drain installations. Externally mounted 3/4 hp wash pump shall be a close coupled type with stainless steel shaft ball or roller bearings, mechanical seals, stainless steel or other corrosion resisting alloy impeller, cast iron casing and shall be self-draining or equipped with means for draining. Unit shall use a maximum of 1.1 gallons of water per cycle. Provide with fresh water rinse. Dishwasher shall be provided with pressure indicating devices and indicating lights for cycle of operation all as standard with manufacturer. Furnish with one peg and one flat rack. One dish rack and one combination cup, bowl, and silverware rack shall be included, visible pressure gauge standard, manual override for extended wash and delivering purposes. Overall dimensions 33 1/4" height x 24 1/4" width x 22 5/8" deep with door opening depth 39 1/2". Power requirements include 3/4" horsepower pump motor, 6.7 Kw electric booster; 115/60/1 phase.

1. Dishwasher Liner

A stainless steel liner with 2"-3" overlap shall be provided to house the undercounter dishwasher.

2. Dishwasher waste piping

With this type of equipment, certain localities require the use of cast-iron waste piping for the first 15 feet from the waste receptacle.

3. Booster Heater

The dishwasher shall be provided with a built-in booster heater capable of raising the supply temperature from 140 degrees F. to 180 degree F. during continuous operation of the dishwasher.

f. Kitchen Canopy Exhaust Hood (NFPA 96 TYPE I)

Kitchen cooking vapors are exhausted through an exhaust hood equipped with

grease extracting baffles, automatic grease wash down, or an approved fire extinguishing system or a water spray fire protection system (See Section 01008 FIRE PROTECTION and specification section 11400). Hood shall not be part of a gas fired rooftop Kitchen make-up air system. Items served by the Kitchen canopy are the range. Hoods shall be constructed of 18-gauge stainless-steel. Make-up air supplied to the hood must shutdown in accordance with NFPA 96 and section 01007 ELECTRICAL REQUIREMENTS including the following:

1) Shut-trip electrical power to cook-top range.
2) Shut off all make-up air to hood.
3) Notify Fire Alarm System of alarm condition.

Dry Chemical fire suppression systems are no longer approved or listed, for protecting Kitchen hood systems and cooking equipment. Where required use pre-engineered wet chemical fire extinguishing systems and include in section 11400 KITCHEN EQUIPMENT REQUIREMENTS. A fire-actuated 286°F damper shall be installed in supply air plenum at each point where a supply air duct inlet or a supply air outlet penetrates the continuously welded shell of the assembly. The damper shall be listed for such use or be part of a listed exhaust hood with or without exhaust dampers.

1. Alternative: The fire extinguishing system can be eliminated from the grease removal, hood and duct system, if the cooking equipment is served by a fire-actuated water system listed to extinguish fire in the grease removal, hood and duct system. These systems are usually provided as part of the grease extractor wash down system.

2. Alternative: Wet chemical fire extinguishing system can be specified to protect all components of the kitchen exhaust system including the duct system. If the wet chemical fire extinguishing system is listed for unlimited duct length protection, protection of duct system is usually accomplished by providing a nozzle in the duct throat only, downstream of the grease extractor. Activation of this nozzle or the water system acts to extinguish the fire in the duct. When fire extinguishing systems are activated, exhaust should remain on. Make-up air supplied to the hood must be shut-off per NFPA 96 and section 01007 ELECTRICAL REQUIREMENTS.

3. Kitchen Ductwork

Shall be in accordance with section 11400A and latest NFPA 96. Per NFPA 96 exhaust duct shall lead as directly as is practical to the exterior of the building, so as to not unduly increase any fire hazard. Ducts shall also have a clearance of at least 18 inches to combustible material. Exhaust ducts must be provided with access openings at all changes of direction and at 12 foot intervals, for cleaning and inspection purposes.

g. Backflow Preventors

Each item of food equipment having water supply and water connection with the water inlet connected below the flood level of the equipment, shall be supplied with a backflow preventor of size and proportions that will allow an ample flow of water to the equipment, but will prevent backflow of waste or polluted water into the water supply system.

h. Plumbing

Plumbing shall be provided as required by Technical Guide Specification 15400 PLUMBING, GENRAL PURPOSE, and herein required. High temperature or chemical rinse may require special (acid-resisting) piping.

i. NFPA 96 Type II Kitchen Range Hood

Each kitchen shall have an electric exhaust hood that is located directly above the electric range. The hood exhaust shall be ducted and discharge directly to the outside, separate of any other hoods or devices. The louvers shall be an inconspicuous part of the overall building appearance. The hood shall be provided with a High-Low-Off manual fan speed selector switch and a separate On-Off light switch. The hood shall include mesh grease filter(s) which are easily removable for cleaning. The hoods fan shall have a minimum capacity of approximately 130 cubic feet per minute at high speed. No kitchen hood exhaust discharge shall be within a horizontal distance of 10 feet (3 m) nor directly above a building entrance.

1.23 EMERGENCY GENERATOR

a. Generator Set. The existing generator set shall be re-used from the existing fire station. It is presently located in existing main Fire Station, Building 1516 relocate to HAZMAT building. It's specifications are as follows:

Onan, Model No. 50DGCA
60 HZ
1800 RPM
P.F.= 0.8
1Ph, KW 50 KVA 62.5
3Ph, KW 50 KVA 62.5

3 Ph Voltages	Amps
120/208	174
120/240	150
277/480	75

1 Ph Voltage	Amps
120/240	260

1. Not Used

2. Day Tank shall be sized for 24 hours..

3. Fuel Oil System. The design and installation of fuel oil systems shall conform to NFPA No. 31 and NFPA No. 37.

4. Fuel Oil Tank. Aboveground tank(s) shall be provided that are double wall, provided with leak and spill containment and leak detection conforming to Federal and local regulations. Piping shall be double walled with leak detection to meet all Federal and Local regulations including 40 CFR 112.7.

b. Back-up Fuel Supply. Provide enough fuel (tank size) for 24 hours of full load operation.

1.24 LIFE CYCLE COST ANALYSIS (LCAA)

The following LCCA shall be provided if the Contractor considers high efficiency boilers, water-cooled chillers for building systems, high

efficient building envelope, desiccant pre-cooling of building air handling units or Photovoltaic lighting systems and shall be provided if proved to be the least life cycle cost effective

1. HVAC systems (high efficiency boilers, water-cooled chillers for building cooling).
2. High efficient Building envelope.
3. Photovoltaic Lighting.
4. Desiccant pre-cooling of all building air handling units in accordance with section 15500A DESICCANT COOLING SYSTEMS.
5. To ensure proper ventilation air requirements are provided the dorm room side of the building consider single zone air handling unit for makeup air to the kitchen and toilet areas versus VAV air handling unit.

a. LCCA calculations and reports will be performed in accordance with WinLCCID. Computer calculations will be performed using the LCCA computer program, which conforms to WinLCCID an 10 CFR 436. Computer calculations will be performed using the LCCA computer program, using methods required for Energy Use Compliance see paragraph ENERGY USE BUDGET (EUB) COMPLIANCE CHECK. The energy to be considered will include all known thermal loads including process, ventilation and occupant loads. Operating hours will be those actually anticipated for operation. The design team will consider and evaluate all design alternatives that are feasible and appropriate for the particular design application under consideration required in other paragraphs of this Section. Special attention will be given to ensure that all feasible energy and water conservation alternatives are included in the analysis, as indicated. For each analysis the alternative with the lowest LCCA will be incorporated into the design. All economic analyses will use the energy price calculation rates furnished under Energy Prices and Discount Factors for Life-Cycle Cost Analysis. During periods of rapid change in fuel prices the average local fuel price for the previous 12 months period should be used in the analysis in lieu of the current contract price. In lieu of performing project specific individual economic studies, the designer may select alternatives on the basis of previous economic analyses or generic studies provided these studies are applicable to the project under design. In all cases, the essential elements of the design selection process including, as a minimum, the basis for which the list of feasible alternatives was developed and the basis upon which the various design decisions were reached, will be documented in the design analysis and retained in the project file. Only requested LCCA's in paragraph of this section shall be considered. Future energy values shall be based on inflation and escalation over a 25 year period in accordance with the WinLCCID USACERL program.

PART 2 NOT USED
PART 3 NOT USED
-- End of Section --

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SECTION 01007

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SECTION 01007

ELECTRICAL REQUIREMENTS

PART 1 ELECTRICAL DESCRIPTIONS AND NARRATIVES

1.1 GENERAL

Electrical systems, including, but not limited to exterior power distribution, interior power, exterior and interior lighting, communication systems, security systems, emergency power systems, and cathodic protection shall be designed to comply with this section chapter and the documents listed below to the extent referenced in this section. The publications are referred to in the text by basic designation only.

Drawings, specifications, design analysis and calculations shall be provided for both the 60 percent design and Final design submittals, and shall be in accordance with SECTION 01336 - 60 PERCENT DESIGN REQUIREMENTS, & SECTION 01338 - 100 PERCENT DESIGN REQUIREMENTS.

Provide new electrical systems, complete and ready for operation. The design and installation of all electrical systems, including manufacturer's products, shall meet the instructions and requirements contained herein and the requirements of the provided technical guide specifications. Where conflicts between these instructions and the guide specifications or criteria exist, these instructions shall take precedence. Any installation requirements within these instructions, but not contained in the specifications, shall be added to the specifications or shown on the drawings. For minimum specification requirements see paragraph TECHNICAL SPECIFICATIONS.

Electrical designs shall give maximum consideration to the comfort of the occupants. The design shall also be economical, maintainable, energy conservative and shall take into account the functional requirements and planned life of the facility. Electrical designs shall also consider life cycle operability, maintenance and repair of the facility and real property installed equipment components and systems. Ease of access to components and systems in accordance with industry standards and safe working practices is a design requirement. All like equipment and accessories shall be from a single manufacturer.

Calculations shall be provided in accordance with SECTION 01336 - 60 PERCENT DESIGN REQUIREMENTS, & SECTION 01338 - 100 PERCENT DESIGN REQUIREMENTS and this section.

1.1.1 References

Publications, codes, specifications and standards shall be used as the basic for the project design and shall include, but not be limited to the following. Publications and codes which use language which implies a recommendation shall be taken to be mandatory. The latest edition for each publication shall be used.

AFI 32-1065 Grounding Systems

EI 16E500	Lighting Design
IEEE C2	National Electrical Safety Code, 2002
IEEE 142	Recommended Practice for Grounding of Industrial and Commercial Power Systems. (Green Book)
IEEE 1110	Powering and Grounding Sensitive Electronic Equipment (Emerald Book)
IEEE 466	Emergency and Standby Power for Industrial and Commercial
IBC	International Building Code, 2000
NFPA 70	National Electrical Code (NEC), 2002
NFPA 75	Standard for the Protection of Electronic Computer/Data Processing Equipment, 1999
NFPA 90A	Installation of Air Conditioning and Ventilating Systems
NFPA 101	Life Safety Code, 2000
NFPA 780	National Lightning Protection Code, 2000
NACE RP0169	Control of External Corrosion on Underground or Submerged Metallic Piping Systems, 1992
NACE RP0190	External Protective Coatings for Joints, Fittings, and Valves on Metallic Underground or Submerged Pipelines and Piping Systems
IES HANDBOOK	Illuminating Engineering Society Handbook, 1993
LIGHTING STANDARDS	Corps of Engineers Standard Lighting Fixture Details Drawing Series No. 40-06-04 http://cadlib.wes.army.mil CADD Details Library, Electrical Details USACE Standard Details 40-06-04, Oct. 97
DISTRIBUTION STANDARDS	Corps of Engineers Standard Electrical Distribution Details. http://cadlib.wes.army.mil CADD Details Library, Electrical Details Electrical Service and Distribution
ETL 94-2	Utility Meters in New and Renovated Facilities
DESIGN GUIDE	Fort Carson Installation Design Guide
DESIGN GUIDE	U.S. Army DG 1110-3-145, March 1986
UFC 4-010-01	DoD Minimum Antiterrorism Standards for Buildings

TELECOMMUNICATIONS INDUSTRY ASSOCIATION/ELECTRONIC INDUSTRIES ASSOCIATION (TIA/EIA).

568B Commercial Building Telecommunications Cabling Standard

569A Commercial Building Standard for Telecommunications Pathways and Spaces

570A Residential Telecommunications Cabling Standard

606A Administration Standard for Commercial Telecommunications Infrastructure

607A Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications

1.1.2 Facility Description

The Fire Station provides fire protection, rescue and first medical response services for Fort Carson, CO. The new fire station is the main station on Fort Carson and is located at the intersections of Prussman Blvd. and Wetzel Avenue. The existing main station (Building 1518)will be demolished. Technical services of the Fire Department will be relocated to the new main station. They provide personnel to inspect facilities, refill extinguishers and review design and construction drawings. Fire fighters assigned to the station sleep, work, train, workout, study, cook, eat, and attend formations at this facility.

The facility shall be occupied (24) hours per day, (7) days per week. Mechanical, electrical and communication rooms, stairs, vestibules, janitor's closets, and storage shall be assumed as unoccupied.

1.1.3 STANDARD PRODUCTS

Material and equipment shall be a standard product 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 label or listing of the Underwriters Laboratories, Inc., will be accepted as evidence that the materials or equipment conform to the applicable standards of that agency. In lieu of this label or listing, a statement from a nationally recognized, adequately equipped testing agency indicating that the items have been tested in accordance with required procedures and that the materials and equipment comply with all contract requirements will be accepted.

1.1.4 Seismic Protection

Seismic Protection for electrical equipment shall be designed and installed in accordance with the requirements of Seismic Protection for Miscellaneous Equipment Specification SECTION 13080 and Seismic Protection for Electrical Equipment Specification SECTION 16070.

1.1.5 Special Environmental Conditions

Electrical equipment such as facility transformers, generators, motors, and other electronic assemblies shall be derated for altitude - 6172 feet.

Motor capacity can be derated similar to procedure used for generators or a

service factor of 1.15 shall be stipulated.

Generators shall be derated for altitude (1 percent for each 330 feet or fraction thereof above 3300 feet mean sea level).

Derate transformers at one-half the percentage applied to generators in the above paragraph.

1.1.6 Building Work Demarcation

A demarcation line extending 60-inches from the perimeter walls of a building has been established to distinguish between work performed under building specifications and site work documents. (Example: underground conduit under a floor slab and extending to the 60-inch line would be covered by UFGS 16415 and beyond that point by UFGS 16375.)

1.1.7 Accommodation of Disabilities

All designs shall incorporate provisions of the Americans With Disabilities Act Guidelines (ADAAG), NFPA 72 and the Uniform Federal Accessibility Standards (UFAS). All aspects concerning placement and sizing from these standards shall be incorporated. In case of a conflict between the ADAAG and the UFAS or the ADAAG and NFPA 72, the ADAAG shall govern. Provisions pertaining to clearances shall generally be accommodated by other disciplines, however the design shall observe some precautions such as avoiding equipment configurations which would project into restricted clear space in corridors.

1.1.8 Color of Exterior Equipment

All exterior electrical equipment such as the service entrance transformer, pad-mounted switches and the emergency generator shall be factory painted base standard color.

1.1.9 Seismic Protection

Seismic protection shall comply with the requirements given in SECTION 01005 and UFGS Specification 16070 Seismic Protection for Electrical Equipment.

1.1.10 Demolition of Existing Facilities

The existing Fire Station shall be demolished after the new Fire Station is completed and the existing control room equipment is reinstalled in the control room of the new facility. Salvage equipment shall be delivered to a location on base as directed by the Contracting Officer. Disposal of potentially hazardous items such as fluorescent tubes, lighting ballasts...etc. shall be as required in SECTION 01400. See SECTION 01002 for additional information on demolition work requirements.

The electrical service conductors for the existing fire station shall be removed back to the existing pad-mounted switch. Duct banks shall be abandoned in place, but shall be removed at least 12-inches below grade and capped. The communication service (fiber optic and copper) shall be handled by the Base Communication Contractor.

The electrical service for the other buildings shall be removed back to the nearest pole or pad-mounted switch. Ducts and/or conduits shall be removed only to a point 12-inches below grade and capped. Communication service conductors shall be removed to 12-inches below grade, then sealed and

capped.

1.2 ANTITERRORISM AND FORCE PROTECTION

a. Unobstructed Space. It is assumed that aggressors will not attempt to place explosive devices in areas near buildings where these explosive devices could be visually detected by building occupants observing the area around the building. Therefore, ensure that obstructions within 33 feet of inhabited buildings or portions thereof do not allow for concealment from observation of explosive devices 6 inches or greater in height. This does not preclude the placement of site furnishings or plantings around buildings. It only requires conditions such that any explosive devices placed in that space would be observable by building occupants.

1) Electrical and Mechanical Equipment. The preferred location of electrical and mechanical equipment such as transformers, air-cooled condensers, and packaged chillers is outside the unobstructed space or on the roof. However this standard does not preclude placement within the unobstructed space as long the equipment provides no opportunity for concealment of explosive devices.

2) Equipment Enclosures. If walls or other screening devices with more than two sides are placed around electrical or mechanical equipment within the unobstructed space, enclose the equipment on all four sides and the top. Openings in screening materials and gaps between the ground and screens or walls making up an enclosure will not be greater than 6 inches. Secure any surfaces of the enclosures that can be opened so that unauthorized personnel cannot gain access through them.

b. Utility Distribution and Installation. Utility systems can suffer significant damage when subjected to the shock of an explosion. Some of these utilities may be critical for safely evacuating personnel from the building or their destruction could cause damage that is disproportionate to other building damage resulting from an explosion. To minimize the possibility of the above hazards, apply the following measures:

1) Utility Routing. For all new inhabited buildings, route critical or fragile utilities so that they are not on exterior walls.

2) Emergency Backup Systems. Where emergency backup systems are required in accordance with requirements or criteria, ensure that they are located away from the system components for which they provide backup.

c. Equipment Bracing. Mount all overhead utilities and other fixtures weighing 31 pounds or more to minimize the likelihood that they will fall and injure building occupants. Design all equipment mountings to resist forces of 0.5 times the equipment weight in any direction and 1.5 times the equipment weight in the downward direction. This standard does not preclude the need to design equipment mountings for forces required by other criteria such as seismic standards.

d. Under Building Access. To limit opportunities for aggressors placing explosives underneath buildings, ensure that access to crawl spaces, utility tunnels, and other means of under building access is controlled.

e. Mass Notification. All inhabited buildings must have a timely means to notify occupants of threats and instruct them what to do in response to those threats.

1) New Buildings. All new inhabited buildings must have a capability to provide real-time information to building occupants or personnel in the immediate vicinity of the building during emergency situations. The information relayed must be specific enough to determine the appropriate response actions. Any system, procedure, or combination thereof that provides this capability will be acceptable under this standard.

1.3 COORDINATION OF ELECTRICAL CRITERIA

All electrical criteria provided in this section shall be coordinated with the architectural section, mechanical section, fire protection section, structural section, interior design section, civil and site section, and all other sections not mentioned here. The number and location of all electrical equipment indicated in the electrical requirements are approximate. Contractor design shall meet the intent of the electrical requirements provided in this section. Contractor shall coordinate the final locations of all electrical equipment with the BASE USERS to be provided by the Contracting Officer in the Field after the award of the RFP.

1.4 EXTERIOR PRIMARY ELECTRICAL DISTRIBUTION SYSTEM

The existing base primary electrical distribution system is a 12470/7200Y volt, 3-phase, 4 wire (grounded neutral), 60 Hertz underground distribution system. The existing site is located at the southwest corner of Prussman Blvd. and Wetzel Ave.

The primary electrical service for the new fire station is located on the northwest side of the corner of Prussman Blvd. and Wetzel Ave. There is an overhead electrical primary line (4#4/0 ACSR) which has overbuilt (circuit 7 and under built (circuit 8) on it. An aerial to underground tap will be required. The existing poles are very congested so the new aerial to underground tap will require a new pole. The aerial to underground tap will feed into a pad mounted switch (S&C type PMH4 or equal) and proceed underground through a new concrete encased duct bank and manholes to the new facility. Crossing under roadways will require jack and bore or directional boring methods so as not to disturb the traffic flow. The base has plans in the future to relocate overhead lines to underground. The base has standardized conductor sizes: 350 MCM for underground, #4/0 for overhead, and #2 for service laterals. Orientation and placement of the new switch shall allow a 10 ft hot stick to be used on the existing switch in all compartments and the new switch in all compartments without interference. Sides which do not require hot stick operation shall not be closer than 4 ft to another object.

1.4.1 Removal

The existing fire station transformer shall be removed and turned over to the Contracting Officer or His/Her Representative.

1.5 EXTERIOR UNDERGROUND PRIMARY ELECTRICAL REQUIREMENTS:

All exterior equipment shall have a paint coating rated for 120 hours of salt spray exposure.

1.5.1 Medium Voltage Pad Mounted Switch

SECTION 00800 Contract Clauses FAR 52.236-5, Material and Workmanship, pad-mounted switches shall be manufactured by S&C Electric Company. No

other product will be acceptable. Provide type PMH-4 by S&C Electric Company. Pad-mounted switches shall be placed on a concrete pad. A ground ring or counterpoise #1/0 AWG minimum shall be provided with two ground rods at opposite corners. The ground ring for the existing pad-mounted switch shall be connected to the new ground ring. The new switch shall have two 12-inch spacers installed between the pad and the switch. Clearance requirements given in paragraph EXTERIOR PRIMARY ELECTRICAL DISTRIBUTION SYSTEM shall be followed.

1.5.2 Medium Voltage Cables

The primary cable shall be 133 percent insulated copper conductors XLPE (anti-treeing type) with outer polyethylene jacket shall be installed in concrete encased ducts. Minimum burial depth shall be 3'-6" below finished grade. A 600 volt neutral shall also be installed in the same duct as the primary feeder and grounded at the pad mounted transformer. Use copper stranding for the shielding. Cables with concentric neutrals shall not be used. All conductors shall be tested after installation.

1.5.3 Terminations and Splices

All primary load break elbows and termination kits shall be rated 15 kV. No splices shall be allowed in manholes, instead an above ground switch shall be located at the needed splice. If a junction is needed, load break elbow terminations are to be placed and used within the existing manhole. Each junction shall be mounted with the manufacturer's recommended mounting screws and the mounting hardware itself shall be capable of changing the angle of the well. The mounting hardware shall be grounded to the ground conductor. Each load break elbow shall have it's own drain conductor grounded to the ground conductor.

1.5.4 Pad-mounted Tamperproof Compartmental Transformers

The pad-mounted transformer shall be a 12470 volt, three phase, delta primary with grounded-wye secondary; oil-immersed unit (non-PCB), outdoor type with copper windings and conductors. The oil used shall be a less flammable type. Aluminum is not acceptable. The transformer shall be looped fed, dead front, bayonet-fused with the elbow lightning arrestors installed on the spare wells of the loop feed. Provide a single "T" style loop-feed sectionalizing switch in the high voltage compartment. See Exterior Underground Secondary Electrical Distribution Requirements for pad transformer secondary distribution voltages. Transformer pad shall extend 10" beyond the edge of the transformer furnished. Transformer pad shall use knock-out areas instead of pouring around the conduit. Provide at least one spare 4" conduit stubbed 5' out from transformer and another spare 4" conduit which runs to the pad-mounted switch. Provide grounding conductor counterpoise around transformer pad (#1/0 AWG minimum) and a grounding rod at each corner of the counterpoise with a minimum of two ground connections between the transformer and the counterpoise.

1.5.4.1 Locations

Transformers of the mineral oil insulated or low flammability ("non-flammable", "less flammable liquid-filled") type shall be located not less than 33 feet from combustible walls or building openings. The requirements of Mil Handbook 1008C shall be met regarding other requirements for the transformers.

1.5.4.2 Grounding

a. When the transformer is delta on the primary, but the primary system voltage is a grounded-wye, bring the neutral (grounded conductor) and connect to the ground lug on the transformer.

b. Frame of the transformer is to be grounded from the high voltage equipment pad and the low voltage equipment pad.

c. On a grounded-wye secondary, a ground strap is required from X0 to the frame, since SECTION 16375 requires X0 to be isolated from the frame.

e. When a building has a lightning protection system with a ground ring and the transformer has a ground ring and the ground rings are within 25 ft of each other, then the ground rings shall be interconnected below grade.

f. Service from transformer to building should not have a grounding conductor. NEC does not require this conductor. If the service is a bus duct, there may be a benefit to installing a grounding conductor of the same size as the neutral.

g. Install a ground ring (counterpoise), minimum size shall be #1/0 AWG, around concrete pad with a ground rod at each corner. The ground ring size shall be increased in size to the proper size per IEEE, if the fault current indicates that #1/0 AWG is not adequate.

h. Extend separate conductors from arresters and transformer neutral/housing and connect to the ground ring.

i. Ground any metallic conduit/duct to the ground ring.

j. Provide any other connections required by the NEC or NESC.

1.5.5 Manholes and Duct Banks

All new distribution primary lines shall be installed underground in a concrete encased duct bank with 4" conduits. There shall be one spare 4" conduit/duct for each filled conduit/duct as a minimum. The duct/conduit used in the concrete-encased duct bank shall be schedule 40 PVC. Contractor shall either use jack and bore or directional boring methods to install 4" electric conduits under roadways. Roadways shall NOT be cut for new duct bank crossing. New electric power manholes shall be provided at 90 degree turns and outside the facility as a minimum. Distance between manholes shall not exceed 300 feet and not more than 360 degrees of total bend. Electric manhole covers shall be stamped "Electric" or similar wording to indicate an electric manhole. Minimum size of manholes shall be 7ft by 7ft by 6ft high. Each manhole and handhole shall have at least one ground rod and a looped ground conductor around the manhole mounted 12 inches above the floor. Where the ground rod enters the concrete, the ground rod shall be taped with electrical tape to 6 inches to each side of the concrete. Each manhole shall have mounting hardware to support the cable. The hardware shall be grounded to the grounded conductor if metallic. Non metallic hardware is preferred. Each manhole shall have hardware to allow for the pulling of conductors installed at the duct bank entrance. Each manhole shall have a permanently installed ladder as part of the manhole. The neck shall be securely attached and not just laid in place. The neck shall also be sealed water tight. Necks made of bricks shall not be used. Conductors shall be looped around the manhole. All conductors in manholes shall be fire taped. Each circuit shall be fire taped individually. Exterior primary distribution system shall be designed

in accordance with Electrical Distribution System, Underground SECTION 16375; and the requirements of this section. A ground rod shall be installed in each manhole. Power and communications ducts can be installed in the same trench. The power and communication ducts would be on the same horizontal level. No other utilities are allowed in the trench.

1.6 EXTERIOR UNDERGROUND SECONDARY ELECTRICAL DISTRIBUTION REQUIREMENTS.

Exterior secondary electrical distribution system to the facility shall be 480Y/277 volt, 3-phase, 4-wire underground feeder in conduit to a Main Distribution Panel (MDP)/Panelboard located in the electrical room. Main facility feeder and main distribution panel shall be sized to have a minimum of 25% spare capacity at the end of the project above the estimated maximum demand for the building. Design of the exterior secondary electrical system shall be in accordance with Electrical Distribution System, Underground - SECTION 16375 and the requirements of this section. See paragraph Equipment Sizing Requirements and Ratings.

1.6.1 Underground Service Entrance/Feeder/Branch Circuits.

Service entrance conductors, branch and feeder circuits shall be single conductor conductors, Type THW, THWN, or USE in accordance with NFPA 70. Service entrance conductors and underground feeder/branch circuits shall be copper conductors with insulating grounding conductor in conduit. Aluminum conductors and direct buried cables are NOT acceptable.

1.6.1.1 Conduits

Conduits shall be PVC coated rigid steel meeting NEMA RN-1 within 5' of the building foundations and schedule 80 PVC elsewhere. Conduits shall be non-encased direct-burial for low voltage circuits. Top of conduit shall be 3'-6" below finished grade.

1.7 EXTERIOR LIGHTING SYSTEM.

Area lighting shall be provided for all parking lots, walkways, above all exit doors, and area signage. POV parking and area lighting for the aprons will be required. Bollard type walkway lighting to the front entrance is an option. Warning lights will be needed where the apparatus vehicles enter Wetzel Ave. Existing street lighting on Wetzel Ave. looked adequate but should be looked at during design. Any new poles/fixtures shall equal existing poles/fixtures on BASE. Design shall be in accordance with IES Handbook, Exterior Lighting Specification SECTION 16528, Electrical Distribution System, Underground Specification SECTION 16375.

1.7.1 Area Lighting

Area lighting shall be provided for all areas noted above. Light levels for the parking lot and Apparatus Bay parking apron lighting shall be average maintained 21 lux/2 fc measured at 6" above finished grade. Area lighting contactors and controls for the building shall be installed in the electrical rooms. Exact location of lighting controls shall be coordinated with the USER during the design of the project. Area lighting control shall be connected into BASE lighting control system. Reference paragraph "Lighting Control" below.

1.7.1.1 Apparatus Bay Parking Apron Lighting

Provide lighting for Apparatus Bay apron (concrete drive) to permit

exterior servicing and maintenance of vehicles during evening hours. Metal halide fixtures controlled from the Dispatch area shall be used for this purpose.

1.7.1.2 Parking Lot Lighting

Parking lot lighting fixtures shall be metal halide and sized to meet lighting criteria and the most economical installation. Poles shall not be located within the parking lot areas. Poles shall be located outside the parking lots behind the curbs. Reference paragraph "Lighting Control" below.

1.7.1.3 Exterior Building Lighting

Exterior building lighting fixtures shall be as indicated in the Corps of Engineers Std. Det. No. 40-06-04, Type EH5. Lamps shall be high pressure sodium and sized to meet the lighting criteria and the most economical installation. Fixture(s) shall be mounted at each entrance for the building. Exterior building lighting fixtures located in eaves shall be compact fluorescent. Reference paragraph "Lighting Control" below.

1.7.2 Lighting Control

Provide disconnect switch with HAND-OFF-AUTOMATIC switch and lighting contactors for exterior lighting controls. Lighting contactors shall be controlled from photocell connected through the automatic leg of the HOA switches. Time clocks shall not be used to control lights. Install lighting controls in the electrical room or otherwise indicated in this section. Lighting controls installed outside the electrical rooms shall be in weatherproof enclosures. Install lighting controls per requirements of this section. Exact location of all lighting controls shall be verified with the USER during design of the project.

1.7.3 Underground Lighting Circuits

Provide underground branch circuits for all exterior lighting circuits. Branch circuits shall be insulated copper conductors with insulated grounding conductor in conduit. Aluminum conductors are NOT acceptable. Direct buried conductors are NOT acceptable. Underground lighting conductors shall be in rigid galvanized steel (RGS) conduit within 5' of the building foundations and schedule 80 PVC elsewhere. Top of conduit shall be 3'-6" below finished grade.

1.7.3.1 Lighting Pole Grounding

All exterior lighting poles and bollards shall be grounded at the base of the pole. Provide a 3/4" x 10 feet copper clad grounding rod at each pole.

1.7.3.2 Conductors

Cables shall be type USE conforming to UL 854, with copper conductors and type RHW or XHHW insulation conforming to UL 44, and shall include green ground conductor. Cable shall be provided with insulation of a thickness not less than that given in TABLE 15.1 of UL 854. Cable shall be rated for 600 volts. Parts of the cable system such as splices and terminations shall be rated not less than 600 volts. Conductors larger than No. 9 AWG shall be stranded.

1.7.3.3 Conduits

Conduits shall be single, round-bore type, with wall thickness and fittings suitable for the application. Conduits shall be non-encased direct-burial, thick wall for low voltage lighting circuits.

1.7.4 Building Lighting Circuits

All exterior fixtures mounted on the surface of the building shall be wired from within the building and shall conform to the Interior Wiring Methods paragraph of this section. No building lighting circuits shall be surface mounted.

1.7.5 Warning Lights

Provide warning lights on exterior of facility to alert fire fighters of an emergency response and to provide warning that fire trucks are preparing to exit the facility. The warning lights shall be a rotating beacon with a red lens. The reflector shall be parabolic. The warning light shall be weatherproof and UL Listed. Revolution rate shall be between 60 - 80 revolutions per minute. Locate warning light around exterior of facility and adjacent to Apparatus Bay apron as shown on the site drawings.

As part of a Fort Carson road renovation, a conduit will be installed at the corner of Prussman Blvd. and Wetzel Ave. (not in contract) for connecting the signal control for the Fire Emergency Vehicles exiting the Fire Station and entering onto Prussman Blvd. Contractor will need to contact the Fort Carson DPW in order to coordinate the size and location of the conduit for the new road renovation. Contractor shall interface with new conduit and install a control system to operate the traffic signal with a proper response at the same time the warning lights are activated, so that, emergency vehicles can enter Prussman Blvd. unimpeded. Contractor shall install a new traffic control light at Prussman Blvd. in front of the new Fire Station to stop traffic while the emergency vehicle exits from the Apparatus Bay. This traffic control light shall be controlled by the Dispatcher.

1.8 CATHODIC PROTECTION SYSTEM

At the proposed site for the new Fire Station, there are several existing cathodic protection test stations located on the site paralleling Prussman Blvd. The Contractor shall relocate these test stations to accommodate the new site layout for the new Fire Station.

A sacrificial anode cathodic protection system shall be provided for all underground metallic lines (including sewer lines), fittings, valves and fire hydrants. If underground lines are non-metallic, then all associated metallic fittings, valves, hydrants, etc. shall be protected. A dedicated galvanic anode shall be used for each fitting, valve, hydrant, etc. All galvanic anodes shall be connected to the structure through a test station. At least one test station shall be provided on each valve, fire hydrant and metallic pipe. Isolate all new piping from existing piping. All insulated flanges or couplings, if not accessible, shall have a test station which is connected to either side of the insulated flange or coupling. All connections to structures shall be done with two conductors: one is the active conductor and one is a spare. A conductor color coding system shall be used: black for anode, red for main structure and blue for a second structure. In addition to the anodes, all metallic pipes must be provided with a coating system. The cathodic protection systems shall be designed and installed in accordance with NACE RP0169 Standards. The design of the system shall be a minimum of 25 years with a soil resistivity

of 1500 ohm-cm. The highest quality magnesium anode shall be used. Criteria for determining the adequacy of protection shall be in accordance with NACE RP0169 and shall be selected by the corrosion engineer as applicable. Design shall be in accordance with Cathodic Protection System, (Sacrificial Anode) - Specification SECTION 13110 and the requirements of this section. Test stations shall be flush-curb box mounted in 1' X 1' concrete pads. Anode wires shall be #10 AWG.

1.9 UNDERGROUND CABLE MARKINGS

A color-coded plastic warning tape shall be place at least 4" wide within the trench above all buried utility lines. RED shall be supplied for the buried electrical lines and ORANGE shall be supplied for all the buried communication lines. In addition to the tape, a tracer wire shall be placed in the trench approximately 4" above the cable or duct.

1.10 INTERIOR ELECTRICAL DISTRIBUTION SYSTEM

The interior secondary distribution voltage within the building shall be 480Y/277 volt, 3-phase, 4-wire. Aluminum is not acceptable. The minimum branch circuit size shall be #12 AWG. The higher voltage (480 volts) shall be used for larger motor loads, equipment loads and all other required loads. The lower voltage (277 volts) shall be used for all the lighting loads. Provide step down transformers for all receptacle loads, small motor loads, computer loads, and all other loads as required. Step down transformers shall have a 25% spare capacity for future loads. Transformer windings and conductors shall be copper. Aluminum is not acceptable. Transformers that serve non-linear loads such as the computer receptacles shall have K-rated transformers. Contractor shall provide the most economical secondary system to meet the requirements of this section. Design shall be in accordance with Electrical Work, Interior - Specification SECTION 16415 and the requirements of this section.

1.10.1 Service Equipment

Service equipment/disconnecting means shall be provided in the Main Distribution Panel (MDP)/Panelboard/(s) located in the electrical rooms. Service equipment/disconnecting means shall be wall mounted. Service disconnect means shall be of the power circuit breaker or insulated-case circuit breaker type. Secondary surge protection shall be provided at the Main Distribution Panel.

1.10.1.1 Main Distribution Panel (MDP)/Panelboard(s)

Main Distribution Panel (MDP)/panelboard(s) shall be in a metal-enclosure. Service disconnect circuit breaker shall be of the power circuit breaker or insulated-case circuit breaker type. Branch and feeder circuit breakers shall be molded-case type circuit breakers, except that branch and feeder circuit breakers with 200 amp trip and larger shall be insulated-case type. Thermal-magnetic breakers larger than 150 amps shall have the instantaneous magnetic trip adjustable. Enclosure shall be ventilated general purpose type wall mounted type. Busses for the Main Distribution Panel (MDP) and all panelboard/(s) shall be copper only. Aluminium shall not be allowed. Each phase, neutral and equipment grounding bus shall be clearly shown on the drawings. Short circuit rating of all busses shall be clearly indicated on the drawings.

1.10.1.2 KWHR Meter

Metering shall comply with Engineering Technical Letter (ETL) 94-2: Utility Meters in New and Renovated Facilities. KWHR meters with 15 minute demand registers shall be provided for recording power consumption of the facility and shall also record maximum demand and power factor for each phase. Meters shall be provided with pulse initiators for connection to the BASE EMCS - (Energy Monitoring and Control System). Meter shall have tele-metering capability. KWHR meters shall also comply with the requirements of Fort Carson, CO area electric utilities.

1.10.1.3 Protective Coordination Study

A protective coordination study to include overcurrent and short current analysis shall be done on the electrical distribution system for the building. The study shall include the overcurrent and short circuit protection for the generator, service transformer, main switchboard disconnect, exterior pad-mounted switch protection and any breaker which has an overload rating of 50% or more of what the rating is for the main switchboard.

1.10.2 Panelboards

Lighting and appliance branch-circuit panelboards shall be of the circuit breaker conforming to NEMA AB-1 and UL 489 and shall be located in the electrical room. Thermal-magnetic breakers larger than 150 amps shall have the instantaneous magnetic trip adjustable.

a. Load-center type panelboards shall not be allowed.

b. Panelboard shall not exceed 78" in height from the finished floor.

c. All panelboards shall have a minimum of 25 percent spare capacity for all loads at the end of the project. Panelboards shall have a minimum of 25 percent spare circuit breakers. Spare circuit breakers shall be redundant of the type of circuit breaker being provided in the panelboard.

d. Panelboard busses shall be copper only. Aluminum busses are not acceptable.

e. The phase loading on panelboards shall be balanced as much as practical by the type of loads on the panel. This includes equally disbursing the spares between the phases.

f. All panelboards shall be provided with a panel schedule which is typed and placed in a protective holder located on the front inside of the panelboard door.

1.10.3 Motors

Motors shall be of sufficient size for the duty to be performed and shall not exceed the full-loading rating when the driven equipment is operating at specified capacity under the most severe conditions encountered.

a. All motors shall have open frames and continuous-duty classification and be based on a 40 degree C ambient temperature reference.

b. All motors shall be derated for altitude - 6145'.

c. All permanently wired polyphase motors of 747 watts or more shall meet the minimum full-load efficiencies as indicated in the Electrical Work, Interior Specification SECTION 16415.

d. Power factor correction capacitors are to be installed with individual motors 25 HP and larger as a minimum, unless the motor is controlled by a variable frequency drive (VFD). In the case of VFD, capacitors are not required.

e. Motor starters shall use circuit breakers instead of fuses.

f. Thermal overloads shall be the bimetallic type that can be reset. The magnetic overload option shall only be used if indicated by the manufacturer of the equipment.

g. Reduced voltage starters shall be used on motors which are 50 Hp or larger as a minimum.

h. Motors above 1 HP shall be high efficiency.

i. All three-phase motors shall have phase loss protection.

1.10.3.1 Apparatus Bay

All apparatus bays will be used as wash bays. Equipment should be rated for wet areas where appropriate. Overhead doors shall have remote control operators. 2 each remote controls for the large doors. 3 each remote controls for the 12'-0" wide doors. The remotes shall be programmable where the remotes are two functions and one remote can open more than one door (separate button for each door).

1.10.4 General Purpose Receptacles

Duplex receptacles for general purpose applications shall be 20 amp, 125 volt, 2-pole, 3-wire grounding type. A maximum of six duplex receptacles may be connected to a receptacle circuit. Receptacle circuits shall not supply lighting loads. General purpose duplex receptacles shall be located in the facility as follows:

a. Provide general duplex receptacles every 10' along the walls in all areas of the building. For small rooms that do not have 10' walls, a minimum of one (1) outlet shall be installed on each wall. Receptacles shall be mounted 15" above finished floor, except that mounting height in the Apparatus Bay shall be 36". In addition, the location of the outlets shall be coordinated with the interior design package (furniture layout) to ensure proper placement.

b. Provide a general purpose duplex receptacle adjacent to each mirror for each sink position located in the bathrooms. Where mirrors are located other than above sinks, provide additional receptacles to accommodate hair dryers. Receptacles shall have (GFI) ground fault interrupters. Mount receptacles 48" above finished floor.

c. Provide ground-fault interrupter, weatherproof rated duplex receptacles around the exterior of the facility. As a minimum there shall be one receptacle between each apparatus stall door on both sides of the facility exterior, two evenly spaced receptacles on the patio, two evenly spaced receptacles on the east exterior wall near the administrative area

and two evenly spaced receptacles on the east exterior wall near the crew area, and two evenly spaced receptacles on the west exterior wall near the administrative area and two evenly spaced receptacles on the west exterior wall near the crew area.

1.10.5 Special Receptacles

Ground Fault Interrupter (GFI) receptacles shall be provided in all rest rooms, sink countertops, janitor's closets, exterior of the facility and the Apparatus Bay, and other wet locations. Weatherproof receptacles for exterior use, shall be mounted in a box with a gasketed, weatherproof, cast-metal cover plate and gasketed cap over each receptacle opening with (GFI). Exact location of the receptacles noted below shall be coordinated with the USER during the design of this project. Provide 20 amp,125 volt, 2-pole, 3-wire grounding type, duplex receptacles in the following locations:

a. Provide duplex receptacles for all vending machines to be installed by the government in the vending areas.

b. Provide a duplex receptacle for each electric water cooler.

c. Provide a dedicated duplex receptacles for the government furnished and government installed copier, printer, and fax machine.

d. Provide a duplex receptacle with ground fault interrupter on the exterior of the building adjacent to each exit door of the building. Mount receptacles 24" above finished grade.

e. Provide two (2) duplex outlets every 72" along each wall in the Electrical/Communications Room, but there shall be at least three duplex outlets along each wall. Outlets shall be 20A, 125 volt, duplex outlets with dedicated branch circuits. Three dedicated circuits shall be used in each Communications Room. Receptacles shall be installed 15" above finished floor.

f. Arc-Fault Circuit Interrupter shall be provided in all dwelling unit bedrooms/Dorm rooms. Provide one (1) dedicated 20 amp, 125 volt duplex receptacle for each EMCS OR DCC panel. Each receptacle provided for the EMCS panels shall have a dedicated branch circuit.

g. Provide one (1) dedicated 20 amp, 125 volt duplex receptacle for each LAN rack. Each receptacle provided for a LAN rack shall have a dedicated branch circuit and ground.

h. Provide a duplex receptacle on the wall between each truck door.

i. Provide one 208V, 30 amp, NEMA 6-30 receptacle in each communications room. Location per input from Fort Carson personnel. Use a dedicated circuit.

j. Receptacles in the Apparatus Bay shall be weatherproof with ground fault interrupter. These receptacles shall be mounted 3' above finished floor.

k. Provide a duplex receptacle outlet in the Fire Inspection Suite, Physical Training, Day Room, Break Room, and Dining Room. Mounting height of the receptacle shall easily accommodate a ceiling mounted TV.

l. Provide a receptacle outlet in the Breathing Apparatus Room for the breathing apparatus trailer, a 220V, 3PH, 60A receptacle to be mounted on the wall and with a 20' shore line with shut off. And a 3" fresh air inlet either from roof line or high on the exterior wall.

m. Provide a floor flush mounted duplex receptacle outlet and LAN data outlet in the center of the Conference Room.

1.10.6 Computer Outlets

Computer outlets shall be duplex, 20 amp, 125 volt, 2-pole, 3-wire grounding type receptacles. A maximum of three duplex computer outlets shall be connected to a receptacle circuit. Circuits shall be sized using 600 volt-amp per computer. Neutral conductors shall be sized at 133% of the phase conductors. Computer outlets shall be labeled as "COMPUTER". Mount the outlets 15" above finished floor. Computer outlets shall be mounted adjacent to the Telephone/Data outlets. Maintain a separation of 6" from the Telephone/Data outlets. Exact location of all Computer Outlets shall be verified and coordinated with the USER during the design of the project. Location of outlets shall be coordinated with the interior design package to include the furniture layout. A dedicated power panel shall be provided for the computer outlets.

1.10.7 Device Plates

Device plates and receptacle bodies shall be ivory in color. Device plates shall be impact resistant plastic in areas with finished walls. In areas with unfinished walls like mechanical walls, the device plate shall be stainless steel.

1.10.8 Other Loads

Designer of Record shall coordinate with SECTION 01003 and with SECTION 01006. The anticipated loading and power configuration for some items was provided, but the Designer of Record is still responsible for the final coordination with the actual equipment installed. Contractor shall provide electrical power to the following loads either by receptacle or direct wired as applicable. If the item is an option and the option is not exercised, the receptacle or a junction box with wire for future connection shall be provided.

Provide two sets of residential type dryers in the Laundry Room, see SECTION 01006. Provide dryer receptacle of the voltage and amperage rating to match the dryer plug.

Provide two sets of residential type washers in the Laundry Room, see SECTION 01006. 115V, 1PH

Provide one commercial type washer/extractor in the Fire Gear Cleaning Room, see SECTION 01006. Power requirements 208/60/3 phase, with FRN10 fuses in a separate disconnect.

Garbage disposal, see SECTION 01006. 115V, 1PH

Electric Hand Dryers are used in the facility. See SECTION 01003.

1.10.9 Architectural/Mechanical Connections

Contractor shall provide branch circuits, disconnect switches, magnetic starters, and all other related electrical equipment and material for all architectural, mechanical equipment and environmental equipment to be installed in the project (includes the facility and site). This shall include all hair dryers, HVAC units, unit heaters, pumps, exhaust fans, carbon monoxide detector control equipment, and all other mechanical equipment in the facility. Urinals, sinks, and blow dryers shall be controlled by passive infrared sensors hard wired to the building electrical distribution system. No batteries shall be allowed for this purpose. Contractor shall coordinate this electrical requirement with the architectural and mechanical requirements.

1.10.10 Food Service Equipment

Food Service Equipment shall comply with local health standards, NSF, AGAL, and UL and shall meet the requirements of Technical Specification 11400. Designer of Record shall coordinate with SECTION 01003 and with SECTION 01006. The food service equipment covered in these sections shall have wiring extended to the equipment location and the appropriate wiring for the device installed and provided. A list of the equipment is given below with the anticipated electrical configuration. Designer of Record is fully responsible for the verify the actual electrical configuration and provide the appropriate wiring.

Two Reach-In Refrigerators	115V, 1PH
Ice Making Machine	208V, 3PH
Microwave Oven	208V, 1PH
Two Freezers	115V, 1PH
Undercounter Dishwasher	208V, 1PH
6 Burner Range w/integral oven and exhaust hood	

A small power panel, flush mounted, shall be provided in the Refrigerator/Freezer room to power all electrical food service equipment in the room. The panel shall be provided with a main breaker. Designer of Record shall coordinate the interface requirements between the associated breakers and the exhaust hood fire suppression system and the dispatch operation to ensure a proper operation of components and systems.

1.10.11 Carbon Monoxide Detectors

Provide carbon monoxide detectors in all bedroom/dorm rooms in the administration and operations areas. Coordinate with Section 01003 and 01004.

1.10.12 Government Furnished/Contractor Installed (GFCI)

Contractor shall provide branch circuits, disconnect switches, magnetic starters, and all other related electrical equipment and material for all architectural, mechanical equipment and environmental equipment which is GFCI in the project. See SECTION 00800 for list of equipment.

1.10.13 Emergency Power

Emergency power units shall be based upon the EMD as calculated in SECTION 01336 plus any other requirements given for the specific emergency power unit.

1.10.13.1 Emergency Standby Generator

The requirements given herein shall be coordinated with the requirements given in SECTION 01006.

Relocate an existing Onan Standby Generator rated at 50KW, 62.5 KVA and Onan Transfer Switch rated at 120/240V, 225A. Relocate from Bldg. 1518 to the HAZMAT building include a wall between the storage area and the generator. Size HAZMAT building to accommodate future generator and equipment sized to serve the designated emergency loads in the new Fire Station.

1.10.13.2 Uninterruptible Power Supply (UPS)

Contractor shall provide new general UPS with capability to supply power to meet the estimated maximum demand (EMD) of the Electrical Room and the Communications Room. The UPS shall power the required circuits in the Communications Room, and the Electrical Room. General UPS will support computers, lighting, bay doors, and paging system. UPS will support all critical and non-critical items yet to be determined. This unit shall be a self-contained UPS unit which is rated for powering nonlinear loads. The UPS unit needs to provide battery back-up power for 10 minutes.

In the Dispatch/911 Center, equipment will be powered from a separate 911 UPS that is existing. This existing UPS will be relocated to the Dispatch/911 Communications Room.

1.11 INTERIOR LIGHTING SYSTEM

The interior design shall be in accordance with the requirements in this section, the IES Handbook, the "Electrical Work, Interior" Specification - SECTION 16415, and the requirements in this section.

1.11.1 Illumination Levels

Maintained illumination levels shall generally not be less than the values listed in the table below. The maintained illumination levels are calculated to desk/table height in offices, bedrooms, alarm room, and dining room. Equipment, mechanical, electrical, communication rooms, and corridors shall have the maintained illumination level calculated to floor level.

ROOM TYPE	INTENSITY lux/(fc)
Apparatus Bay	325/30
Bedroom/Dorm	325/30
Corridors	160/15
Communications Room	325/30
Electrical Room	325/30
Janitor Closet	55/5
Lobby	215/20
Locker Rooms	325/30
Mechanical Rooms	325/30
Office Areas	540/50
Restrooms	325/30
Storage/Supply Rooms	216/20
Vestibule	160/15
Library/Conference Rooms	540/50
Copier Area	215/20

Vending	215/20
Medical Storage	325/30
Day Room	325/30
Laundry	325/30
Dining Room	325/30
Physical Training	540/50
Kitchen	540/50
Dispatch Center	540/50

1.11.2 Conservation Requirements

Illumination levels, in conjunction with energy conservation, shall be obtained by the most life cycle cost-effective techniques including, but not limited to, the following:

a. Provide multiple switching of multi lamp fixtures or multiple switching of fixture groups in large rooms, or both, to permit lighting fixtures to be turned off in unoccupied areas. Note that a switch shall be allowed to only control lighting within a single room.

b. Provide energy efficient lamps and solid-state electronic ballasts.

c. Occupancy sensors shall be used for locations such as conference rooms where use would be intermittent and where control would generally be accessible to several individuals or functions. Passive configurations such as infrared sensors are to be used, unless the application is better suited to ultrasonic.

d. Location of light switches shall be coordinated with the floor plan and furniture layout to ensure that they are easily accessible and convenient. Location shall be coordinated with the User.

1.11.3 Fluorescent Fixtures

Fluorescent light fixtures with T8, 34 watt lamps shall be used in all areas of the building, except the Apparatus Bay and where dimming is required. Fluorescent light fixtures in offices shall use 3 lamps. Offices shall be provided with multi-level switching (0%-33%-66%-100%). Fixtures in other areas such as corridors, restrooms, lobby, storage/laundry, physical training room, etc. shall be 2 or 3 lamp fluorescent type fixtures. Acrylic lenses on fluorescent fixtures may be used in restrooms, showers...etc. where fixtures are subject to damp atmospheres or where added protection for the lamps may be required. Fixtures in utility areas such as mechanical rooms, electrical/ communications room, storage rooms, and janitor's closet shall be industrial fluorescent type fixtures with open reflectors. Lamps in open industrial fixtures shall have protective tubes installed over the lamps. All ballasts shall be of the energy saving electronic type with power factor correction to exceed 90%. Low mercury "green type" fluorescent, compact-fluorescent, and high pressure sodium lamps/bulbs shall be installed when available in the proper size and type for the application. Ballasts shall have a total harmonic distortion (THD)less than or equal to 10%. Dimmable lighting can consist of dimmable compact fluorescent light fixtures instead of incandescent.

Common fixture sizes are 2 by 2 ft and 2 by 4 ft;however, the 2 ft by 2 ft shall be used only when the 2 ft by 4 ft cannot be used or specifically approved by the Base.

1.11.4 Incandescent Lighting Fixtures.

Incandescent lighting fixtures shall not be used, except for dimming applications.

1.11.5 Egress and Exit Lighting Fixtures

Egress and exit lighting design design shall be in accordance with NFPA 101 and ETL 94-5. Exit lights shall be LED type XL1 - Corps of Engineers Std. Det. Dwg. No. 40-06-04 and shall use red LEDs. Egress and exit light fixtures shall have individual battery back-up. Egress lighting fixtures shall be provided from room fluorescent light fixtures through out the facility, except that fluorescent light fixtures shall be added to supplement the metal halide fixtures in the Apparatus Bay. Provide night lighting in the Apparatus Bay and the Corridors.

1.11.6 Apparatus Bay Lighting

Lighting fixtures shall be enclosed, pendant, integrally ballast, industrial, high intensity discharge fixtures with metal halide lamps. Fixtures shall be similar to Corps of Engineers Std. Det. Dwg. No. PH6, PH7, or PH8 in Corps of Engineers Std. Det. Dwg. No. 40-06-04. Lamp size shall be selected to provide the most economical installation. Fixtures shall be provided with shatter proof lenses or metal guards for breakage protection. Lighting shall be designed with two levels (high-low) of lighting for maximum energy conservation. Fluorescent lighting shall be provided for low level and emergency lighting in the bay. Apparatus Bay lighting shall be controlled by the Dispatch Center.

1.11.7 Conference Room

The Conference Room shall have multilevel lighting and dimmable recessed incandescent light fixtures to allow audio/visual equipment to be used and still take notes.

1.11.8 Corridor Lighting

Lighting in the sleeping room corridors shall have flush mounted fixtures installed near floor level in addition to the direct overhead lighting. This lighting shall be a low ambient floor lighting. Lighting shall be controlled from the Dispatch Center.

1.11.9 VDT Lighting

Provide work area VDT lighting in the Fire Inspector's area, Dispatch/911 Center in addition to the overhead direct lighting.

1.11.10 Undercounter Lighting

Provide fluorescent undercounter lighting in the kitchen. Provide undercounter lighting for the desks in the bedrooms/dorms. Receptacles shall be used to power these lights. All lighting in all dorm rooms shall be controlled from the Dispatch Center.

1.11.11 Drop Cord Lights

Drop cord lights shall be provided in the area between each truck pair in the apparatus bay (total of 10). The lights must be accessible from the

floor, but not in the way when not in use. The drop cord shall have a length of 40 feet. The reel shall have continuous swivel. Provide a grounded head lamp with a polypropylene guard. A on/off switch shall be provided in the handle. The maximum lamp wattage shall be 75 watts. Reel shall be mounted above the clear height restriction given for the Apparatus Bay.

1.11.11.1 Dorm Room Lighting

Dorm room lighting shall have a two light system. There will be a general fluorescent light controlled within the sleeping area and a second low wattage incandescent light install over the door that will be controlled by the Dispatcher. There will be a "A" or "B" selector switch for the light and PA speaker, so that, the Dispatcher will have the option to call Team A or B individually as a group, or both groups.

1.12 EXTERIOR GOVERNMENT COMMUNICATION DISTRIBUTION SYSTEM

This design shall be in accordance with the Telephone System, Outside Plant Specification SECTION 16711, Electrical Distribution System, Underground Specification SECTION 16375 and the requirements of this section. Many of the communication, fire alarm, intercom, public address, radio and dispatch systems will have portions of the work and equipment handled by a Base Communications Contractor (BCC). The demarcation points of work are explained below in the paragraph Base Communications Contractor.

1.12.1 Communications Ductbank/Manholes

Minimum burial depth shall be 3'-6" below finished grade. Each manhole shall have mounting hardware to support the cable. The hardware shall be grounded to the grounded conductor if metallic. Non metallic hardware is preferred. The manholes will be grounded in accordance with IEEE C2.

A new duct bank will be run on the south side of Prussman Blvd from the project site to Specker Ave and then north across Prussman Blvd to an existing manhole 405A. Crossing under roadways will require jack and bore or directional boring methods so as not to disturb the traffic flow. 200 pair of copper cable will be installed from the new facility to a termination point in manhole 405A. A new fiber-optic line will be installed from the new facility in the new duct bank to manhole 405A and then continue in existing duct to building 1551 and terminated there. Pairs 001-100 of the new 200 pair copper cable will be spliced to existing cable 11, pairs 101-200 in manhole 405A. Pairs 101-200 of the new cable will be clear and capped.

1.12.2 Removals/Relocations

All underground communication wiring to the existing fire station must be protected until it can be removed after the new fire station is completed. See site drawings. Manholes shall have the lids and frames raised to the new grade.

There are cable markings indicating a buried cable running directly through the proposed building site. The fiber optic cable is active and belongs to QWest. The cable will be relocated by others (not in contract) prior to construction. The 6" conduit will be relocated by the Contractor.

1.13 INTERIOR COMMUNICATION SYSTEM

The telecommunications (telephone) system design shall comply with NEC Article 800, Corps of Engineers specifications, TIA/EIA 568B, 569A, 607A, and applicable regulations. The design shall form a complete communications system, including, but not limited to: wires, terminations, raceway, cabinets, and outlets, as determined by the criteria for each project. All wiring shall be tested.

All interior communication wiring systems shall have the cabling labeled with a unique alpha-numeric number at beginning and end termination points of the cable. This alpha-numeric number shall also be used placed by the jack on the device plate.

The wiring between outlets and the termination points in the Communication Equipment Rooms can be supported by j-hooks rated for Category 5e cabling or by the use of cable trays. If cable trays are used, the cable trays shall be run above the suspended ceiling. The type of tray used shall be a solid bottom type cable tray. Cable trays shall have the wire spacing suitable for Category 5e cables. Trays shall have 20% spare capacity.

Cable trays shall be provided in the ceiling area above the cabinets and wall mounted cross connect blocks in the two Communication Rooms. Sizing shall include the 20% spare capacity.

A record of all communication wiring installed by this contract shall be provided in a Windows based cable management software along with a hard copy of the printout. A licensed copy of the cable management software shall be provided.

1.13.1 General

All electronic devices (computers, file servers, hubs, concentrators, phones, etc.) are not part of this contract and will be installed by the USER. Each facility design shall be in accordance with Premises Distribution System Specification - SECTION 16710, Electrical Work, Interior Specification SECTION 16415 and the requirements of this section. Distance limitations for cabling lengths shall be in accordance with the TIA/EIA standards. All communications voice and data equipment placement shall be in accordance with the Installation Information Infrastructure Architecture (I3A) Implementation Guide prepared by the U.S. Army Information Systems Engineering Command, Fort Huachuca, Arizona.

1.13.2 Communication Terminal Backboard

Provide a 3/4" plywood backboard on all walls (floor to ceiling) in both the Communications Rooms. The plywood telephone backboard shall be provided with a fire retardant coating. Contractor shall coordinate location of incoming telephone service with the location of the surge arrestors and cross connect blocks on the telephone backboard with the Base Communications Contractor. All underground conduits entering the Communication Room shall be stubbed up 6" above finished floor adjacent to the telephone backboard. The equipment layout in the Communication Rooms shall be approved by Fort Carson personnel.

1.13.3 Telephone/Data Conductors/Conduits

Copper cables shall be 24 gauge, 4 pair, EIA-TIA 568B Category-5e, unshielded twisted pair (UTP), plenum rated, solid copper station cable. Terminate

cables on jacks with EIA 568B sequencing. All telephone conductors shall be installed in conduits per Wiring Methods paragraph in this section. All cables including patch cords shall be U.L. tested at a minimum of 155 MHz operation. Extrapolation from a lower frequency is not allowed. The installation acceptance test shall be a "channel test" and includes all patch connections and cables. Testing shall be accomplished with a Cat 5e, Level 2 compliant, time domain reflectometer. Cables are dedicated to one device/jack i.e. no daisy chaining.

1.13.4 Telephone/Data Outlets

Provide a two jack outlet, unless indicated otherwise: one jack for telephone and one jack for Data (LAN), in a single-gang outlet junction box sized in accordance with the UFGS 16710. Each outlet shall be RJ-45, eight pin. Provide outlet junction box and 3/4"C from the junction box. The conduit shall terminate 8" above the suspended ceiling and the end of the conduit shall have a chase nipple installed. In areas where this isn't a suspended ceiling, the conduit with pull junction boxes per UFGS 16710 shall be provided to a point 6" into an area above a suspended ceiling. Telephone and data (LAN) cables are not allowed to be visibly exposed along wall or ceilings. Therefore, ensure there is a conduit path (above a suspended ceiling or below raised floor), which allows the signal and communication cable and/or conduit to get from the outlet to the termination point in the Communications Rooms. The tables below show the quantity and room location requirements for telephone and LAN (Data) outlets.

Each outlet shall be mounted 15" above finished floor, unless indicated otherwise. All Telephone/data outlets locations shall be coordinated with the interior design package to include the furniture layout. Fort Carson personnel shall have final approval on the location of the outlets.

TELEPHONE OUTLET

Provide a single jack for these outlets.

ROOM NAME	Number of Outlets
Main Entrance w/ weatherproof Phone Enclosure	1*

*Provide weatherproof system for exterior wall phone by entrance

TELEPHONE/LAN OUTLETS

These outlets consist of one jack for telephone and one jack for LAN (Data)

ROOM NAME	Number of TELEPHONE/LAN Outlets
Admin. Support	2
Conference Room	2*
Break Room	1
Fire Chief's Office	2
Shift Leader	2
Fire Inspector's Office	4
Chief Fire Inspector's Office	2
Disinfection/EMS Decontamination	1
Fire Gear Cleaning Area	1
Wet Fire Extinguisher	1
Breathing Apparatus Room	1
Library/Crew Meeting	8
Captain's Office	2
Physical Training	1
Day Room	1

Dining Room	1
Kitchen	1**
Dry Chem. Extinguisher	1
Mech/Elec Room	1
Mech/Generator Room	1
All Dorm rooms	1
Reception Area	2

*One set of outlets shall be an in flush mounted box which has a duplex power outlets and a telephone/LAN outlet. The flush mounted box shall be located directly below the center of the conference table. The second outlet shall be wall mounted near the front of the room. Plus a conduit is required to connect to the conference table. See SECTION 01003 and SECTION 01004 for the interface requirements with the table.
**These outlets shall be mounted at 48-inches AFF for wall mounted type phones.

1.13.5 Cross Connect Blocks

Cross connect blocks shall be the Category 5e, 110 type. The telephone cross connect blocks shall have stand-off brackets and shall be wall mounted in the Communications Room. Each 4-pair telephone shall terminate on its own terminal on the 110 block. Provide the necessary quantity of blocks to accomplish this plus provide one additional block for future connections. See drawings for location of the blocks.

1.13.6 Satellite Support

Provide 2" galvanized, rigid steel conduit which runs from the Radio/Communications Closet to the northwest exterior corner of the building.The conduit shall terminate at a weatherproof junction box located 3ft below the eave. Provide an RG-6 cable in the conduit and terminate at the exterior junction box with 12-inches of slack. The end of the cable shall have an F-Type connector. Satellite dish is to be installed and provided by Others.

1.13.7 Other Communication Support

Provide 2" galvanized, rigid steel conduit which runs from the Communications Room and is terminated outside the facility at the antenna mast near the Administrative area. The conduit shall do a 90 degree bend at the location and terminate at a NEMA 12 enclosure which is 12"L x 12"W x 6"H located on the bottom of the antenna mast. Conduit shall not be buried without direction from the Contracting Officer or his/her representative. Conduit is for radio antenna support.

The antenna mast shall be designed to support seven antennas which shall be installed by others. The new antenna mast will be needed to mount the following antennas: Satellite dish (for weather data), BSTRS radio antenna (existing white antenna), BSTRS radio antenna (existing green antenna), Local weather gathering antenna, VHF antenna, two antennas for the Harlow radio Fire Alarm reporting system. The exact type of antenna and the mounting requirements shall be obtained from Fort Carson personnel.

The antenna mast shall be between 45 ft and 49 ft in height above finished grade with this height including the antenna height. The antenna mast is not allowed to have guys or be supported from the facility. It must be a free-standing antenna mast. The antenna mast construction shall meet the requirements given herein and in UFGS 16781. The wind velocity for design

shall be 100 mph. The antenna mast shall be located in the mechanical screen wall area located west of the facility. The color of the pole shall match the criteria given for exterior equipment.

1.13.7.1 Dispatch/Communications Rooms

Contractor shall ensure that the 911 capability is maintained during the relocation of the 911 System from the existing Fire Station to the new Main Fire Station. Coordination must be made for the cut over to maintain some kind of connectivity and emergency response for Fort Carson.

In the Dispatch/911 Center, raised access flooring is required. Three console pods (county 911 is purchasing new console pods and equipment and will relocate). Equipment will be powered from a separate 911 UPS (911 UPS is existing). 911 UPS will be relocated to the 911 communications room. Provide a main communications equipment room with room for 2- 19" racks for DOIM (power from new bldg UPS) and 3- 19" racks for county 911 (2 racks are existing and will be relocated by county 911, racks to get power from 911 UPS). Door leading into Dispatch Center needs a cipher lock. Dispatch radio equipment (existing equipment to be relocated by Fort Carson). In the 911 Supervisor's room, one console pod (county 911 is purchasing new console pods and equipment and will relocate). Equipment will be powered from a separate 911 UPS. (911 UPS is existing). Provide a unit kitchenette in the Dispatch/911 Center.

In the Radio Communications room, raceway access will be required from this room to the exterior antenna. Provide a 19" rack with shelving to house 2 RAFAR units; BSTRS units provide space for the floor mounted radio equipment (existing).

1.13 PUBLIC ADDRESS (PA) SYSTEM

The public address system shall have all conduit, junction boxes, and Category-5e shielded pair plenum wiring (24 AWG) for speakers, Category 5e 110 blocks, speakers, grilles, amplifiers, etc. for a complete and usable public address system in accordance with the guidance herein and with the requirements given in UFGS 16770. The speaker cables shall terminate on cabinet-mounted 110 blocks located in the Communications Room. The physical size of the blocks shall be coordinated with the cabinet. The quantity shall be coordinated with the number of cables required. Each speaker cable shall terminate on its own terminal at the 110 blocks. All power required for the system shall be supplied. Public address system cables are not allowed to be visibly exposed along wall or ceilings except in the communications room. The speakers inside the facility are ceiling mounted in the ceiling tile.

All areas in the operations side are to have a PA system. In all dorm rooms, PA system is to be controlled by the Dispatch Center. In all dorm rooms, provide a control system in each room that can control the lights and PA system independently and can be activated from the Dispatch Center depending on which Company is on alert and that has a switch that allows the occupant to select one of three positions (Company A, B, or C). Contractor shall provide the exact location for the speakers and as approved by the Government. Design/Build Contractor shall ensure obstructions are not present which would prevent or hinder the installation of the speakers, conduit and wiring. The amplifiers for the public address system shall be supplied and installed in the Communications Room.

Information on zones shall be supplied by the User.

All interior communication wiring systems shall have the cabling labeled with a unique alpha-numeric number at beginning and end termination points of the cable. This alpha-numeric number shall also be placed by the jack on the device plate.

ROOM NAME	Number of Speakers
Corridor	1
Captain's Office	1*
Captain's Dorm	1
Captain's Dorm	1
Wet Fire Extinguisher	1*
Breathing Apparatus Room	1*
Dry Chem. Extinguisher	1*
Mech/Elec Room	1*
Dining Room	1
Corridor	1
Storage 2	1
Fire Gear Cleaning	1
Corridor	1
Communications Room	1
Physical Training	1
Day Room	1
Kitchen	1
Laundry Room	1
Women's Toilet	1
Men's Toilet	1
Vestibule	1
All Dorm Rooms	1
Men's Shower/Locker Room	1
Library/Crew Meeting	1
Corridor	1
Alcove	1
Disinfect/EMS	1
Alcove	1

Three exterior public address horns are required: One is required on the northwest exterior corner of Room 143, one is required on the northwest corner of Room 171, and one is required on the east wall of Room 148. *The speakers for these areas shall have wall mounted, volume control capabilities. The volume control unit shall be located by the door into the room.

1.14 SECURITY AND CLOSED CIRCUIT TELEVISION SYSTEMS

Closed circuit television system is required for this facility. Provide junction boxes, conduit, and wiring for the ceiling dome camera, monitor, cipher electronic lock, electric strike plate and flush mounted door speaker in accordance with the requirements herein and specification UFGS 16751. The main entrance to the facility shall have a ceiling dome camera (weatherproof), located to view a person at the entrance. This person would pick up a phone which would ring directly into a phone located in the Dispatch Center where the closed circuit television monitor is located. The dispatch operator shall be able to activate a switch to release the strike on the front door to let the person(s) into the facility. Conduit shall be a minimum size of 3/4" galvanized, rigid steel conduit. Wiring, conduit and junction boxes for these systems shall be provided from the

equipment location at the main entrance to the Dispatch Center and Communications Room. Provide a dedicated duplex receptaclee outlet to power the camera and strike plate. The receptacle shall be located above the drop ceiling at the main entrance vestibule. The monitor shall be ceiling mounted in the Dispatch Center at a location indicated by the User.

Provide all necessary power and signal wiring to support an access card reader to be located at the main entrance.

1.15 TELEVISION (CATV)

Flush mount receptacles 15" above finished floor in bedrooms and 6" below ceiling for all other rooms. The location of the outlets shall be coordinated with the interior design package (furniture layout) and shall be approved by Fort Carson personnel.

The CATV shall have all conduit, junction boxes, and RG-6, 75-ohm cable and terminators for a complete and usable system in accordance with the guidance herein and with the requirements given in UFGS 16710. The cables shall be homerun to the nearest Communications Closet. NO DAISY CHAINING ALLOWED. Each cable is dedicated to a single outlet. Cables shall be terminated in the nearest Communications Closet with F-Type connectors and each cable shall have a minimum excess length of 6ft. The single-gang, outlet junction box for the jacks shall be sized in accordance with the requirements of UFGS 16710 and 16794. The CATV jacks shall be F-Type, female connectors. The 3/4" conduit from the outlet box shall terminate 8" above the suspended ceiling. In areas where this isn't a suspended ceiling, the conduit with pull junction boxes per UFGS 16710 shall be provided to a point 6" into an area above a suspended ceiling. CATV cables are not allowed to be visibly exposed along wall or ceilings except in the communications room. Two duplex receptacles are required in the Communications Rooms to support the CATV equipment.

All interior communication wiring systems shall have the cabling labeled with a unique alpha-numeric number at beginning and end termination points of the cable. This alpha-numeric number shall also be placed by the jack on the device plate.

ROOM NAME	Number of outlets
Fire Chief's Bedroom	1
Shift Leader	1
Chief Fire Inspector's Office	1
Fire Inspector's Office	3 wall mounted
Receptionist	1
Break room	1 wall mounted
Conference Room	1
All Dorm Rooms	1
Captain's Dorm	1
Captain's Dorm	1
Library/Crew Meeting	1
Physical Training	1 wall mounted
Dining Room	1 wall mounted
Day Room	1 wall mounted

1.16 EMCS (ENERGY MONITORING AND CONTROL SYSTEM)

The building shall be wired for EMCS (Energy Monitoring and Control System). All EMCS sensors will be installed per Mechanical specifications. See Mechanical SECTION 01006 for EMCS options and requirements. Provide

coaxial cable (RG-6/U) or 62.5 micron, duplex, multi-mode fiber optic cable in 3/4" conduit from each DDC panel to the patch panels located in the Communications Room. Coordinate and provide the correct cable type and configuration per the requirements in Specification 15951. Provide power as required for all EMCS or DDC components (such as dampers, VAV boxes, control panels, etc.) requiring power.

1.17 WIRING METHODS

Wiring shall conform to NFPA 70, Electrical Work, Interior Specifications SECTION 16415 and the requirements of this section.

1.17.1 Power Conductors

Interior conductors shall be copper only. Aluminum conductors are not allowed. Minimum conductor size shall be #12 A.W.G. Conductors shall be installed in conduits. Power and lighting conductors shall be 600 volt, Type THHN (in dry locations), and THW or THWN (in wet locations). Cabling systems such as Mineral-Insulated cables, metallic armored cables and nonmetallic-sheathed cables shall not be allowed on this project.

Most available terminating components and materials are UL approved based on use with 60°C conductor insulation in circuits of 100A or less and 75°C insulation in circuits over 100A. Conductors shall be sized based upon the 60°C ampacity column of NEC Table 310-16 for sizes through #1 AWG and the 75°C column for #1/0 and larger.

Contractor shall ensure that all wiring must be in place before insulating the walls whether wiring is in conduit or not in conduit.

1.17.2 Communication Conductors

Communication conductors shall be provided per paragraph "INTERIOR ELECTRICAL DISTRIBUTION SYSTEM" of this requirement and Premises Distribution System, Specification SECTION 16710.

1.17.3 Conduits

Wiring shall consist of insulated conductors installed in rigid aluminum conduit, rigid zinc-coated steel conduit, electrical metallic tubing, electrical nonmetallic tubing (ENT), or intermediate metal conduit IMC). ENT shall only be used where allowed by the NEC and only for the circuits going to communication outlets, except for those in the Apparatus and Vehicle Maintenance Rooms. ENT shall not be used for power circuits. Plastic conduit is allowed only underground or under the floor slab. Raceways shall be concealed within finished walls, ceilings, and floors. Conduit which is exposed along walls in areas which are subject to damage such as the Apparatus Bay and Vehicle Maintenance shall use IMC along the walls.

1.18 GROUNDING SYSTEM

The grounding system shall be designed in accordance with NEC Article 250 and the following criteria. In general, all metallic building components including reinforcing steel and miscellaneous metals shall be part of an electrically continuous ground system. Steel studs used in interior wall construction, T bars of the ceiling grid, diffusers of the air distribution system, and door hardware are exempt from this bonding requirement. Bonding shall be by exothermic welding or the brazing of a copper wire

between components. Design shall be in accordance with Electrical Work, Interior Specification - SECTION 16415 and this section. All ground rods on the project shall be 3/4" x 10' copper clad steel.

1.18.1 Communication Grounding System

All exposed non-current carrying metallic parts of the telephone equipment, cable sheaths, cable spices and terminals shall be grounded. Contractor shall provide a a 12" x 1/4" ground bar along each wall in each communications room. The bars shall be connected together by 6 AWG insulated copper cable. The ground system for the two communications rooms shall be interconnected with #6 AWG insulated copper cable in 1/2" PVC conduit. The grounding system in the Communications Rooms shall be connected to a dedicated ground rod located outside which in turn is connected to the ground ring (counterpoise) for the facility. Use 6 AWG copper grounding conductor in 1" conduit from the ground bus located in the Communication Room to the building service ground.

1.18.2 Grounding Conductors

A green equipment grounding conductor, sized in accordance with NFPA 70 shall be provided, regardless of the type of conduit. Equipment grounding bars shall be provided in all panelboards. The equipment grounding conductors shall be carried back to the service entrance grounding connection or separately derived grounding connection. Grounding conductors shall be provided in all branch (including lighting circuits) and feeder circuits.

1.18.3 Earth Electrode System

The maximum resistance measure in accordance with IEEE Std 81 of a driven ground rod shall not exceed 25 ohms under normally dry conditions. Ground rods shall be 3/4" x 10' copper clad ground rods. In addition to the ground rods, 6 ground wells (one at each corner of the building) shall be provided for test purposes. These are the same ground wells indicated for the Lightning Protection System.

1.18.4 Separately Derived Systems

For dry-type transformers within buildings, the grounding electrode conductor shall be connected to adjacent structural steel per NEC. If there are multiple dry-type transformers within a room, a copper ground bar sized shall be used has the connection point. This bar shall be connected to the building ground ring via a ground rod located outside. The grounding bar and the conductor connected the bar to the ground ring shall be sized to handle the combined fault duty of the equipment connected. Use exothermic welds for the connection. If backup generators can assume building loads, interconnect with the service ground. Verify that connections are located so that any service ground fault equipment will operate as intended (one neutral bond or 4-pole transfer switches, etc).

1.18.5 Raised Floor

The raised floor system shall be grounded to the facility ground ring with #6 AWG copper conductor. The raised floor supports shall be grounded in two locations: one in the Dispatch/911 Communications Room and one in the Dispatch/911 Center.

1.19 LIGHTNING PROTECTION SYSTEM

The Contractor shall provide a lighting protection system in accordance with LIGHTNING PROTECTION SYSTEM - SECTION 13100 and NFPA 780. Lighting protection system provided shall include (but not limited to) air terminals 18", main conductors, down conductors, bonding conductors, and 3/4" x 10' copper clad steelground rods interconnected by a counterpoise routed around the perimeter of the building. In addition to the ground rods, 4 ground wells (one at each corner of the building) shall be provided for test purposes. All conductors shall be copper, except that aluminum or bronze may be used for connection to mechanical aluminum housings. All connections below grade, to main conductor and down conductor shall be by exothermic weld process. Alternate bonding methods will be allowed to metal bodies (vent hoods, exhaust stacks...) which have light enough weight to make exothermic welds impractical. Down conductors shall be concealed in PVC conduit.

1.20 FIRE DETECTION AND ALARM SYSTEM

The fire detection and alarm system requirements are provided in Fire Protection SECTION 01008 and herein. Design shall be in accordance with Fire Detection and Alarm Specification, Addressable - SECTION 13851 and the requirements of Fire Protection SECTION 01008. Fire alarm system shall be addressable to each device. The annunciator panel shall be located in the Dispatch Center. Hybrid systems which have addressable loops are NOT acceptable. All alarms/status conditions for each device shall report/sound/flash local to the facility.

1.21 EQUIPMENT SIZING REQUIREMENTS AND RATINGS

Required capacity of the equipment bus shall be computed from the estimated maximum demand for the panelboard, switchboard, switchgear, motor control center and specified as the next larger manufactured standard bus or main lug size. The EMD shall be calculated as indicated in SECTION 01336. Overcurrent protection for panelboards, switchboards, switchgear and motor control centers with heavy motor loads, sizing must also consider starting current of the largest motor or motors in addition to the continuous demand amperes correlating to the EMD watts or volt-amps.

1.21.1 Interrupting Capacities

Equipment ratings shall be determined based on results of the short circuit analysis required in SECTION 01338. Minimum standard interrupting ratings shall be identified on the plans preferably on a one-line diagram or alternately in panel schedules. Ratings may be called out in the specifications when single items are involved. The designer shall identify variables (such as equipment impedances) which could affect available short circuit current and verify that equipment acceptable under contract plans and specifications would not permit fault current levels higher than the specified interrupting ratings.

1.21.2 Transformers

1.21.2.1 Oil Filled Transformers

Facility transformer shall be sized to have a minimum of 25% spare capacity above the estimated maximum demand for the building.

1.21.2.2 Dry Type Transformers

Dry type distribution transformers be sized for the EMD plus have 25% spare capacity. Dry type transformers larger than 75 kVA shall be tested per the requirements in SECTION 16415.

1.21.3 Feeders and Branch Circuits

Branch circuit sizes shall be based on the load supplied EMD and voltage drop requirements given in SECTION 01336. Feeders to distribution equipment such as panelboards, motor control centers, and switchboards shall be sized to allow the full capacity of the panelboards, motor control centers, and switchboards bus bar amperage rating to be used. Voltage drops shall be taken into account in accordance with SECTION 01336.

1.21.3.1 Transformer Feeders

Sizes for primary and secondary feeders for transformers shall be based on the transformer kVA instead of the EMD on the transformer. This criteria also applies to the service entrance conductors.

1.21.3.2 Neutral Sizing

Use of full size neutrals shall be standard practice. For all applications involving discharge type lighting (fluorescent, HID) or other harmonics generating equipment (inverter, variable frequency drives, other solid state apparatus), the neutral must be treated as a current carrying conductor. In data processing applications including personal computers, the neutral must be sized larger than the phase conductors. Size the neutral at 133 percent minimum (of the phase conductors) unless a harmonic analysis or field data demonstrates that a smaller size would be adequate. Multi-wire branch circuits with oversized neutrals shall not share a common neutral, but will have an individual neutral for each phase conductor.

1.21.3.3 Derating

Ampacity of conductors is to be derated per NEC Article 310, if more than three current carrying conductors are installed in a raceway. When nonlinear loads are served, the neutral must be treated as a phase conductor. If a double size neutral is employed, count it as two line conductors.

1.21.3.4 Parallel Runs

Use of bus duct should be considered in lieu of parallel runs of cable when required ampacity is at or above 800A. Parallel runs of cable shall be limited to a maximum of 4. Equipment grounding conductors in each leg must be sized to carry the total fault current based on the rating of the upstream overcurrent device.

1.21.4 Nuisance Tripping

For a period of one year after construction, the contractor shall be responsible for correcting problems which may arise from nuisance tripping. Nuisance tripping shall be defined has having breakers or fuses activating under an overload condition while the equipment was being operating within manufacturer parameters. These situations shall be corrected by making changes to the installation at no cost to the government. These corrections can be increasing the trip setting or fuse size, as long the increased setting is still at or below setting maximums given in NFPA 70. Any change could impact other items not listed such as conductor sizing and

upstream coordination settings.

1.22 Dispatch Operation

The Contractor is to coordinate the final screen development with the Base Fire Department through the Contracting Officer. Provide information on the use of colors, flashing symbols, and pop-up or pull down menus. The intent is to have the screen look and operate much the same as it presently does in the existing fire station. The Contractor shall enter all data needed to make the system operational More specific items, which are part of the requirements, are covered below.

a. The existing software package is a Windows based software package.
b. Provide all programming necessary for the computers and related equipment to perform the necessary functions.
c. Perform post-optimizing testing to ensure system functions properly.
d. Provide support services for one year for the maintenance of the completed system.
e. Furnish appropriate wire and cable, terminating lugs and attaching tools to have a fully complete and functional system.
f. Provide a complete set of as-builts for the system which shows all connections and locations of equipment.

1.22.1 Installation

The Contractor shall install all system components including Government furnished equipment, and appurtenances in accordance with the manufacturer's instructions and shall furnish all necessary connectors, terminators, interconnections, services, and adjustments required for a complete and operable system. All interior wiring, including low voltage wiring outside the fire station control console and equipment racks, cabinets, boxes and similar enclosures, shall be installed in steel conduit. Minimum conduit size shall be 1/2-inch. Flexible cords or cord connections shall not be used to supply power to any components, except where specifically allowed in writing by the Government. Grounding shall be installed as necessary to preclude ground loops, noise, and surges from adversely affecting system operation. The installation wiring shall use terminal strips only; wire nuts or crimp terminals shall not be permitted. Devices shall use terminal points, strips or screw terminals for the wiring connections points -pigtail connections are not acceptable. If the manufacturer needs to use special cable e.g. twisted and shielded, then the wire size minimum and insulation voltage rating shall as a minimum be met.

1.22.2 Testing

The Contractor shall perform site testing, and adjustment of the completed dispatcher system. The Contractor shall provide all personnel, equipment, instrumentation, and supplies necessary to perform all testing. Written notification of planned testing shall be given to the Government at least 14 days prior to the test, and in no case shall notice be given until after the Contractor has received written approval of the specific test procedures.

The Design/Build Contractor must have all facility equipment tested and shown to be working properly prior to any of the Government Furnished Equipment is allowed to be disconnected.

The Contractor shall then demonstrate that the completed system complies

with the contract requirements. Using approved test procedures, all physical and functional requirements of the project shall be demonstrated to properly function. The performance verification test as specified shall not be started until after receipt by the Contractor of written permission from the Government, based on the Contractor's written report including certification of successful completion of initial testing performed by him showing the system is ready. The Government may terminate testing at any time when the system fails to perform as specified. The Contractor shall deliver a report describing results of functional tests, diagnostics, and calibrations including written certification to the Government that the installed complete system has been calibrate and, tested. The testing shall as a minimum include:

a. Operation of all electrical and mechanical controls and verification that the control performs the designed function.
b. Verify that all data signal cables are terminated properly.
c. Verify that all time delay restrictions have been met, by measurement of actual time delays.
d. Verify that the date and time marks are correct.

1.23 Schedule of Connections

All wiring associated with the operation of the dispatch program and its interface to other systems; and all equipment wiring for the Dispatch Center console shall provide a schedule of connections which as a minimum comply with the following items.

a. Provide a means of rapidly identifying the circuits in any conduit, panel, device backbox or other electrical enclosure, including complete circuit routing from origin to termination.
b. Reduce the complexity of the Contractor's shop drawings and record drawings, thereby simplifying review and maintenance.

The schedule of connections shall identify by number:
a. All junction boxes, device backboxes, terminal cabinets, equipment cabinets and electrical enclosures.
b. All system conduits and pull boxes.
c. All system conductors, including point-to-point routing and terminations.

The schedule of connections shall cross-reference the equipment, conductors and raceway components as follows:
a. For each unique wire/circuit number, the schedule shall as a minimum indicate:
1. Origin and destination, showing both equipment (tag number) and termination identification.
2. Conductor description including size, type, color code and configuration.
3. Routing information comprised of a listing of conduit, junction box, pull box, device backbox, panel, terminal cabinet and electrical enclosure numbers reflecting a progressive route selected for each conductor/circuit from point of origin to destination (termination to termination).
b. For each unique conduit, junction box, pull box, device backbox, panel, terminal cabinet and electrical enclosure number, the schedule shall as a minimum indicate:
1. Conduit size.
2. A listing of conductors/circuits carried.

1.24 TESTING

Contractor shall provide all testing required by all specifications provided to the Contractor. Testing shall include low voltage conductors, high voltage conductors and communication conductors and all other mandatory testing required by the specifications provided with this section.

1.25 TRAINING

Training shall include the emergency generator system and all other mandatory training required by the specifications. Fire alarm system training is covered in SECTION 01008.

1.26 TECHNICAL SPECIFICATIONS

Government provided (UFGS) technical guide specifications (available to the Design-Build Contractor as indicated in SECTION 01332, DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES) shall be completely edited and fully coordinated with the technical requirements given in the drawings to accurately and clearly identify the product and installation requirements for the facility. The specifications shall be edited in accordance with the designer notes associated with each specification and with the Specification Requirements (Division 01 General Requirement Specifications). In case of a conflict, the criteria found in the Specification Requirements (Division 01 General Requirement Specifications) shall take precedence. The provided specifications define the minimum requirements for items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals and testing that shall be provided for the facility. Where items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals or testing requirements are not covered in the provided specifications, special Sections within each guide specification(s) shall be prepared to cover those subjects. Specific items of equipment identified in the provided specifications but not required for the facility shall be edited out. Government approval is required for any specification addition or deletion. The FIRE DETECTION AND ALARM SYSTEM, ADDRESSABLE - SECTION 13851 has been edited completely for this project and is to be considered as an extension of the Specification Requirements.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01008

FIRE PROTECTION REQUIREMENTS

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SECTION 01008

FIRE PROTECTION REQUIREMENTS

PART 1 FIRE PROTECTION REQUIREMENTS

1.1 GENERAL PARAMETERS

Fire protection shall be based on sound fire protection engineering principles that gives safeguards against loss of life and property by fire, consistent with the mission, risk involved, and economical utilization. Fire protection criteria shall be based on the following code requirements:

International Building Code (2000 Edition)
NFPA 101 (Life Safety Code, 2000 Edition)
NFPA 72 (National Fire Alarm Code, 2002 Edition)
NFPA 13 (Installation of Sprinkler Systems, 2002 Edition)
NFPA 90A (Standard for the Installation of Air Conditioning and Ventilating Systems, 2002 Edition
NFPA 1221 (Installation, Maintenance, and Use of Public Fire Service Communication Systems, 2002 Edition)
Military Handbook 1008C (10 June 1997)

All applicable requirements of the aforementioned codes shall be incorporated into the design. Life Safety Code, NFPA 101 relative to this design shall give special attention to the application of fire codes as they relate to Life Safety. Features of fire protection based on the following shall be included in the design: automatic operating devices; exiting for inhabitants and the protection of egress components; personnel safety in hazardous areas; appropriate ratings of partitions, doors and windows; travel distances; common paths of travel; occupancy types; hazard of occupancies and their contents; isolation from the remainder of the facility; etc.

Applicable requirements of the International Building Code shall also be included in the design. These shall include the following: Types of construction; Fire area limitations; increases to allowable floor areas; separation of structures.

All military construction must comply with the code requirements set/forth in Military Handbook 1008C.

1.1.1 Types of Occupancies and List of Hazardous Areas/Essential Equipment

1.1.1.1 Occupancy Classification

This project consists of one building. The building shall be an Mixed 3Occupancy in accordance with NFPA 101, Section 6.1.14. The various occupancies comprising this mixed occupancy are Business, Storage and Residential. According to the International Building Code (IBC), the building shall also be classified as mixed use with "Group R-1, Group S-1, and Group B occupancies in accordance with Chapter 3.

1.1.1.2 Classification of Hazard of Contents

The classification of hazard of contents shall be determined by the portion of the building which has the greatest hazard.

1.1.2 Separation of Structures

1.1.2.1 Exposure Classification

The building construction is a one-story structure. The types of non-combustible roof construction options available for each facility shall be determined by the Proposer.

1.1.2.2 Separation Distance in Feet

IBC, Table 602 requires a separation of 30 feet , unless the exterior wall has a one-hour rating.

1.1.3 Fire Fighting Support

The main fire fighting support shall be supplied by automatic wet pipe and dry pipe sprinkler systems. These fire protection and suppression systems shall be tied into the building's fire detection and alarm system. The building shall be provided with fire extinguisher cabinets. These shall be located so that not more than 75 feet of travel distance between fire extinguisher cabinets shall be required at any point in the facility. The fire extinguisher cabinets shall be of the fully recessed type in all finished areas as permitted by the wall construction. Semi-recessed fire extinguisher cabinets may be permitted subject to approval based on their location and the limitations of the wall construction. Fire extinguisher cabinets required in the Apparatus Bays and Shop type areas may be surface mounted..

See subsequent paragraphs of this Fire Protection section for additional information regarding fire suppression, detection, and other aspects of fire fighting support. Fire extinguishers are to be Contractor furnished/Contractor installed.

1.2 FUNCTIONAL AND TECHNICAL REQUIREMENTS

1.2.1 Construction for Fire Resistances of the Building Including Roofs, Walls, and Doors.

1.2.1.1 Building Construction Type

The building shall comply with a minimum Type II-B construction in accordance with IBC, Table No. 601.

1.2.1.2 Exterior Walls

Exterior walls of the facility shall be nonrated as long as minimum distances from other buildings are maintained.

1.2.1.3 Roof

The building roof covering shall be Factory Mutual Approved or classified by Underwriter's Laboratory as Class A, roof system.

1.2.1.4 Interior Walls

One hour fire resistive walls shall be constructed or separate janitor's

closets, mechanical rooms, electrical rooms, and communications rooms per NFPA 101, from other parts of the buildings. All penetrations in fire rated walls (conduits, pipes, cable trays...etc.) shall be fireproofed according to their respective wall/floor/ceiling rating (sealed) at each penetration. IBC, table 302.3.3, shall be used to provide the appropriate separation between the various occupancies. For example a two-hour separation is required between the R-1 and S-1 occupancy, a one-hour separation between the B and R-1 occupancy and a one-hour separation between the B and S-1 occupancy in a building that is totally sprinklered.

1.2.2 Type of Occupancies, Occupant Loads,Exits, and Travel Distances to Exits

1.2.2.1 Occupancies

The facility shall be considered an mixed occupancy in accordance with NFPA 101, with business (chapter 38), storage (chapter 42) and residential (chapter 28) comprising the various occupancies.

1.2.2.2 Occupant Load

For purposes of determining required exits, the occupant load shall be based upon the maximum number of persons intended to occupy that space but not less than NFPA 101, chapters 28, 38 and 42..

1.2.2.3 Means of Egress

Not less than two exits shall be accessible from every part of the facility.

1.2.2.4 Travel Distance to Exits

Allowable travel distance limits to exits shall be per NFPA 101, Chapters 28, 38 and 42.

1.2.2.5 Allowable Floor Area

Allowable floor area limitations shall be in accordance with IBC, Table 503 and Sections 506and 507. Proposer shall determine construction type and apply the applicable portion of this code requirement. However, it is required that the building be provided with a 100% sprinkler coverage automatic sprinkler coverage.

1.2.2.6 Maximum Building Height

Maximum height limitations are outlined in IBC, Table 503. Note that in addition FAA height restrictions shall be followed also.

1.2.3 Fire Extinguisher Cabinets

Fire extinguisher cabinets shall be provided per NFPA 10 with a travel distance between fire extinguisher cabinets not to exceed 75 feet. Fire extinguisher cabinets shall be fully-recessed in finished areas, such as administrative, corridors, etc. as permitted by the wall construction. Semi-recessed fire extinguisher cabinets may be permitted subject to approval based on their location and the limitations of the wall construction. Fire extinguisher cabinets required in the Apparatus Bays and Shop type areas may be surface mounted. Fire extinguishers shall be part of this contract. Type and size of Fire Extinguishers to be coordinated

with Base Fire Department.

1.2.4 Sprinkler Systems

Sprinkler systems shall be provided for 100% coverage and shall be wet pipe abd dry pipe sprinkler systems. Systems design shall be in accordance with NFPA 13 and Military handbook 1008C. An area of demand of 3000 square feet shall be used for the wet pipe sprinkler system, and 3900 square feet for the dry pipe system. The hose stream demand shall be 500 gpm. The Apparatus bay shall be protected with a dry pipe system. Densities as per Mil-Hdbk 1008C shall be used. Density for office area, sleeping rooms, etc shall be 0.1 gpm/sf. Density for mechanical room, janitors closet, kitchen, etc shall be 0.15 gpm/square foot. Density for the Apparatus Bay shall be 0.2 gpm/square foot.

1.2.5 Fire Department Connections and Fire Hydrants

Fire Department connections for the sprinkler system(s) shall be provided with suitable all weather access for pumper apparatus within 150 feet, reference Mil Handbook 1008C, Section 2.11.1. A minimum of one fire hydrant shall be located within 150 feet of the fire department connections, reference Mil Handbook 1008C, Section 5.7.3.2 (a).

1.2.6 Resistance to Interior Finishes and Materials to Flame Spread and Smoke Development

1.2.6.1 Interior Finishes

Interior finish materials on walls, ceilings, and partitions in all exits shall be Class A as defined in the International Building Code (IBC) and Mil. HdBk 1008C Section 2.7. All other areas shall have Class A or B interior finish materials for walls, ceilings, and furnishings. Smoke Developed Ratings shall not exceed 50 for Class A materials and 100 for Class B materials when tested in accordance with ASTM E-84.

1.2.6.2 Cellular Plastics

Cellular Plastics shall not be used as interior wall and ceiling materials per Mil HdBk. 1008C, Section 2.7.

1.2.6.3 Floor Finishes

Floor finishes shall be Class I or Class II. Carpet and other floor finishes shall have passed the acceptable criteria of American Society for Testing and Materials (ASTM) standard 84 or equivalent.

1.2.7 Fire Alarm and Detection System

Design shall be in accordance with Fire Detection and Alarm Specification, Addressable - SECTION 13851 and the requirements of this SECTION 01008 and shall be coordinated with SECTION 01007. Fire alarm system shall be addressable to each device. Hybrid systems which have addressable loops are NOT acceptable. Fire alarm system shall be the Harlow Fire Alarm System. All alarms/status conditions for each device shall report/sound/flash local to the facility and also report back to Bldg. 500 (Fire Station #2). Contractor shall provide all programming required at the facility and at Bldg. 500to accommodate the facility fire detection and alarm system.

Notwithstanding Section 00800 Contract Clauses FAR 52.236-5, Material and

Workmanship, the Fire Detection and Alarm System shall be manufactured by Harlow Fire Alarm System in order that compatibility with the existing Fort Carson Fire Detection and Alarm System be maintained. No other product will be acceptable. The Competition Advocate authorizes sole source procurement.

1.2.7.1 Panel Location

The Main Fire Alarm control panel shall be located in the Mechanical/Electrical Room. A local annuciator at the facility shall be provided in the Dispatch Center.

1.2.7.2 Connection

See SECTION 01007 regarding the communication connection requirements for the fire alarm. Provide, install and test any modems or patch cords necessary to have the system operate fully. Provide wiring from the fire alarm panel to the the communication equipment connected to the central fire station head end equipment.

1.2.7.3 Detectors

Heat detectors are to used unless NFPA 72 or other codes require the use of smoke detectors. A smoke detector shall be located near the main fire alarm control panel, even if the room has a sprinkler system.

Also a non-latching smoke detector shall be provided in each bedroom. The smoke detector with a sounder (horn) base.

Use smoke detectors above ceilings if this area is used as a return air plenum. The detector must be listed for the air velocities present. Provide smoke detectors under raised floors even if the area is not used as a return air plenum.

1.2.7.4 NFPA 13, NFPA 72, and NFPA 90A Requirements

Provide control modules, smoke detectors, heat detectors, OS&Y tamper switches and water flow switches as required by NFPA 13 and NFPA 72. Provide fire dampers in ductwork as required by NFPA 90A.

1.2.7.5 Other Requirements

Provide duct detectors, manual pull stations, flow switches, tamper switches, notifications appliances, etc.. The notification appliances shall be with flashing strobe.

1.2.7.6 Alarm Verification

The system shall be provided with alarm verification features. The alarm verification features shall reduce false alarms due to transient conditions. The alarm/activation delay shall be adjustable from 0 to 60 seconds.

1.2.7.7 Indicating Devices

Evacuation indicating signalling devices shall be provided and designed in accordance with NFPA 101. Evacuation alarms shall be activated by a smoke detector, a manual pull station, or a flow switch. Horns shall be provided

throughtout the facility (emphasis on corridors and entrance/exit points) to ensure 15 db above ambinet is met. Provide device(s) for noisy areas; i.e., Mech. Rooms and Break Rooms. An electric alarm horn (gong) shall be provided on the exterior of the facility above the fire department connection. This horn shall alarm upon indication of flow from the sprinkler system(s) and have a different tone from other audible devices provided under this contract.

Each sleeping quarters/bedroom shall be provided with a minihorn/strobe which shall activate during a facility (general) alarm event. However, each sleeping room shall be provided with a smoke detector which shall sound just a local alarm in that room. The room smoke detector shall be non-latching, this signal shall not sound an alarm throughout the facility.

1.2.7.8 System Design

The fire detection system shall be designed IAW the above criteria, with the criteria specified in paragraph SYSTEM DESIGN of technical specification SECTION 13851, FIRE DETECTION AND ALARM SYSTEM, ADDRESSABLE, and with the criteria specified SECTION 01007 ELECTRICAL REQUIREMENTS.

1.2.7.9 Dispatch System

The dispatch system shall be coordinated with the above criteria, Specification SECTION 13851, FIRE DETECTION AND ALARM SYSTEM, ADDRESSABLE, and with the criteria specified in SECTION 01007.

1.2.7.10 Schedule of Connections

All wiring associated with the operation of the facility fire alarm system and its interface to other systems shall provide a schedule of connections which as a minimum comply with the following items.

a. Provide a complete record of all system connections for future system expansion, maintenance and testing.
b. Provide a means of rapidly identifying the circuits in any conduit, panel, device backbox or other electrical enclosure, including complete circuit routing from origin to termination.
c. Reduce the complexity of the Contractor's shop drawings and record drawings, thereby simplifying review and maintenance.

The schedule of connections shall identify by number:
a. All junction boxes, device backboxes, terminal cabinets, equipment cabinets and electrical enclosures.
b. All system conduits and pull boxes.
c. All system conductors, including point-to-point routing and terminations.

The schedule of connections shall cross-reference the equipment, conductors and raceway components as follows:
a. For each unique wire/circuit number, the schedule shall as a minimum indicate:
1. Origin and destination, showing both equipment (tag number) and termination identification.
2. Conductor description including size, type, color code and configuration.
3. Routing information comprised of a listing of conduit, junction box, pull box, device backbox, panel, terminal cabinet and electrical enclosure numbers reflecting a progressive route selected for each

conductor/circuit from point of origin to destination (termination to termination).
b. For each unique conduit, junction box, pull box, device backbox, panel, terminal cabinet and electrical enclosure number, the schedule shall as a minimum indicate:
1. Conduit size.
2. A listing of conductors/circuits carried.

1.3 DESIGN OBJECTIVES AND PROVISIONS

1.3.1 Zoning and Treatment of Each Potential Hazard

1.3.1.1 Walls

All areas where a potential hazard exists greater than that of the primary occupancy, shall be separated from the primary occupancy by walls having not less than 1-hour fire resistive construction.

1.3.1.2 Limiting Fire Spread

Every horizontal opening, and hazardous location as defined by NFPA 101 shall be protected.

1.3.1.3 Fire Alarms and Extinguishing Systems

The facilities shall be provided with a fire suppression system and a detection system as indicated previously.

1.3.2 Provision and Maintenance of an Unobstructed Emergency Egress System.

All corridor widths, clear space requirements relative to exit doors, etc., shall be in accordance with the Uniform Federal Accessibility Standards for unobstructed egress.

1.3.3 Dead Ends

* Maximum dead ends shall be as per NFPA 101 (LSC).

1.3.4 Egress Locations

Egress locations shall be marked with exit signs per Section 5-10 (LSC).

1.3.5 Outside Exit Doors

Doors for outside exit doors shall swing in the direction of exit travel. Outside exit doors shall be equipped with panic hardware mounted 3'-8" above the finish floor and have a minimum clear width of 2'-10" to allow for egress.

1.3.6 Required Fire Exits

Required fire exits from the building shall lead to a public way or to a clear safe area at a minimum distance of 75 feet from the building.

1.3.7 TRAINING

a. Training courses shall be conducted for five (5) operating staff members designated by the Contracting Officer in the maintenance and operation of the Fire Alarm System. A training day is defined as eight (8)

hours of classroom instruction, including breaks and lunchtime, Monday through Friday, during the daytime shift in effect at the training facility. For guidance in planning the required instruction, the Contractor shall assume that the attendees will have a high school education or equivalent, and are familiar with the systems. No training will be scheduled until training manuals and O&M manuals have been approved by the Government.

b. The course shall be taught at the project site for a period of five (5) training days. The training courses shall cover all the material contained in the Operating and Maintenance Instructions, the layout and location of each system and shall include the following for each system: preventive maintenance, troubleshooting, diagnostics, calibration, adjustment, commissioning, installation, and repair procedures. Typical systems and similar systems may be treated as a group, with instruction on the physical layout of one such system.

1.3.8 TECHNICAL SPECIFICATIONS

Government provided (UFGS) technical guide specifications (available to the Design-Build Contractor as indicated in Section 01332, DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES) shall be completely edited and fully coordinated with the techincal requirements given in the drawings to accurately and clearly identify the product and installation requirements for the facility. The specifications shall be edited in accordance with the designer notes associated with each specification and with the Specification Requirements (Division 01 General Requirement Specifications). In case of a conflict, the criteria found in the Specification Requirements (Division 01 General Requirement Specifications) shall take precedence. The provided specifications define the minimum requirements for items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals and testing that shall be provided for the facility. Where items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals or testing requirements are not covered in the provided specifications, special Sections within each guide specification(s) shall be prepared to cover those subjects. Specific items of equipment identified in the provided specifications but not required for the facility shall be edited out. Government approval is required for any specification addition or deletion.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01040

AS-BUILT DRAWINGS

10/02

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SECTION 01040

AS-BUILT DRAWINGS
10/02

PART 1 GENERAL

1.1 DEFINITIONS

The definitions listed below form a part of this specification.

1.1.1 Red-Line Drawings

Accepted design 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 electronic CADD files developed from the accepted design drawings that include all of the information from the redline drawings and suitable for half-size reproduction.

1.1.3 Vellum Drawings

Drawings on erasable Vellum 20# similar or equal to Xerox Zero solvent vellum.

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 Half-Size Drawings

14 inches x 20 inches nominal size drawings with all details visually readable.

1.1.7 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 120/6 WRICO or similar.

1.1.8 Mylar Drawings

Drawings on polyester film, 3 or 5 mil, similar or equal to K & E Stabilene.

1.1.9 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.

1.1.10 Accepted Design Drawings

Construction set of complete design drawings, which have been accepted by the Government, for the construction phase of the contract.

1.2 GENERAL REQUIREMENTS

The work includes creation of electronic CADD files on Microstation J 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 DistrictCADD standards Omaha District Microstation CADD Standards, which includes Microstation and Adobe Acrobat files regarding blocks, cells, fonts, standard drawings and standards, will be made available to the successful offeror. See requirements in this section and folder on solicitation CD-ROM labled "CADDSTD" file named "CADDSTD.PDF" for a summary of Omaha District Microstation file requirements. The Contractor shall be responsible for furnishing the required CAD software. The As-Built drawings shall include all major features of the work and all details to the same level as the accepted design set of drawings. All changes from the accepted design drawings, including but not limited to all deviations, additional information, and modifications to the contract. Where accepted design 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, 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 accepted design 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), $(number of drawings in accepted design package x $250 per sheet) 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).

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 Microstation J with "clouding". 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). 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 Microstation J without "clouding". As-Built preparpation 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 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.

1.4.3 As-Built Preparation

Both preliminary and final electronic as-built drawings shall be produced in accordance with the following process for MicroStation drawings:

1.4.3.1 For Microstation (*DGN.) Files

a. When opened, the drawing shall be seen exactly as it should be plotted.
b. Only one view port is open in the file.
c. The view shall be zoomed to fit the border.
d. All information in the title block shall be filled in, including plot scale.
e. The information in the title block shall be correct, including the design file name and the plot scale.
f. All files shall reference a MicroStation border supplied by the Omaha District.
g. Detach all unused reference files.
h. For any half tone references, the logical name shall have common

first or last character(s). Preferably use "_xxx" at the end of the logical name. Include this information with the pertinent information.
i. All unnecessary information outside the border shall be deleted.
j. All files shall be compressed.
k. The font resource file used shall be included with the set, even if it is the standard MicroStation font resource.
l. An ASCII text file shall be provided with the following information: reference file paths that should be added to MS_RFDIR, the name of your font resource file, the name and phone number of the person we need to contact if we have problems, and the version of MicroStation used to create and/or work on the drawings.

1.4.3.2 Not Used

1.5 PROCEDURE

The Contractor shall 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 accepted design 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 accepted design 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 accepted design 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.

3.2.2 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

Shop drawings that deviate from the accepted design 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 accepted design 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 accepted design 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 01/02

PART 1 GENERAL

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SECTION 01200

WARRANTY OF CONSTRUCTION
5/00; Rev 01/02

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 01330SUBMITTAL 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

-- End of Section --

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SECTION 01320A

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08/01; Omaha Rev. 10/01

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SECTION 01320A

PROJECT SCHEDULE
08/01; Omaha Rev. 10/01

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 disks, formatted to hold 1.44 MB of data, compatible with Microsoft Windows 95/98 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 07/02

PART 1 GENERAL

Attachments: Submittal Register
ENG Form 4025, Transmittal Form

1.1 SUMMARY

This section includes administrative and procedural requirements for construction submittals presented by the Contractor after 100% corrected plans and specifications have been accepted by the government. This section also includes requirements for developing, submitting and maintaining a "Submittal Register".

1.2 CONTRACTOR RESPONSIBILITIES

The Contractor is responsible for total management of his work including approval, 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. 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 and Government compliance reviews 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. The Contractor shall coordinate all submittals with the Contractor's Designer (A-E). Approval by the Contractor's Designer means that the submittal is in compliance with the Construction Set design submittal.

1.3 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:

Construction Progress Schedule
Health and safety plan
Work plan

Quality control plan
Environmental protection 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

1.4 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.4.1 Designer Approved ("G-AE")

Designer approval is required for extensions of design, critical materials, deviations, any deviations from the solicitation, the accepted proposal, or the completed design, 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-AE" are subject to approval by the Contractor's Designer, prior to submittal to the Government. The Contracting Officer has the option to review any submittal. The Government will review all "G-AE" submittals for conformance to the solicitation and all submittals designated as variations from the Solicitation or 100% corrected design or as directed by the Contracting Officer.

1.4.2 Government Reviewed Construction Submittals ("G-AO")

"G-AO" submittals subject to Government review are those so designated by the Contracting Officer during the design process or preconstruction meeting. All "G-AO" submittals shall be reviewed and approved by the Contractor's Quality Control Representative and the Contractor's Designer prior to submittal to the Government. Within the terms of the Contract Clause entitled "Specification and Drawings for Construction," they are considered to be "shop drawings." Any variance must clearly identify the variance as specified in paragraph: "Variations", below.

Government review is required for designated "G-AO" submittals and variations from the the solicitation requirements and completed design. Review will be only for conformance with the contract requirements. This also includes those construction submittals for which the design documents did not include enough detail to ascertain contract compliance. Government review will not include development of design calculations or other means of determining adequacy of design. The Contractor and his designer retains the sole responsibility for adequacy of design.

1.4.3 Information Only (FIO)

All "FIO" submittals shall be reviewed and approved by the Contractor's Quality Control Representative and the Contractor's Designer prior to submittal to the Government. 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.

1.4.4 Administrative Submittals

The submittal items listed below are not to 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 approval, via a Serial Letter: Quality Control Plans (Section 01451A CONTRACTOR QUALITY CONTROL), Accident Prevention Plans (Section 01400 SPECIAL SAFETY REQUIREMENTS, Revisions to 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. Submittals provided by Serial Letter shall be submitted in two (2) copies to the Area or Resident (as directed) Office.

1.5 GOVERNMENT REVIEWED SUBMITTALS

The Contracting Officer's review 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 appear to meet the Solicitation requirements. Government Review will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Design and CQC requirements of this contract is responsible for design, compliance with design criteria required in the solicitation, dimensions, all design extensions, such as the design of adequate connections and details, etc. and the satisfactory construction of all work. After submittals have been reviewed for conformance or approval, as applicable, 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.

1.6 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer, obtain the Contractor's Designer approval and Government review, or approval, when applicable, and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. Any submittal found to contain errors or unapproved variations from the solicitation or accepted proposal, shall be resubmitted as one requiring "approval" action, requiring both Designer's approval and Government conformance review or approval, as applicable. 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.

1.7 WITHHOLDING OF PAYMENT

No Payment for materials incorporated in the work will be made if all required Designer or Contractor Quality Control Representative approvals or required Government conformance reviews, or appprovals, as applicable, have not been obtained. No payment will be made for any materials incorporated in the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

1.8 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. The Contractor's Quality Control (CQC) representative, and the Designer, as applicable, shall check, approve and stamp, sign, and date each item, indicating action taken. Proposed variations from the solicitation (contract requirements)or accepted 100% corrected design 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 conformance review or approval by the Government 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.

1.9 SUBMITTAL REGISTER AND ENG FORM 4288 (RMS) SUBMITTAL REGISTER

The Contractor's Designer(s) shall develop a complete list of submittals during design. The Designer shall identify required submittals in the specifications. The list is to be used in preparing Submittal Register as approved by the Contracting Officer Representative. The example Submittal Register furnished with the Solicitation was created using Specsintact Software. The Contractor shall replace this example Submittal Register with the actual submittal register for the completed design specifications. The list is not all inclusive and additional submittals may be required. The attached and Contractor generated 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 (AE or RE). Any submittal without a submittal classification and submittal reviewer identifier is considered to be For Information Only (FIO). The submittal register generated by the Government Resident Management System (RMS) Software is used for tracking construction submittals and is referred to as ENG Form 4288 (RMS). Much of the same information contained on the Contractor generated submittal register will be included on the ENG Forms 4288 (RMS). The Contractor shall maintain a 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 on which will be listed each item of equipment and material of each type for which fabricators' drawings, and/or related descriptive data, test reports, samples, spare parts lists, O&M manuals, or other types of submittals are required by the completed project specifications. The Contractor shall complete the appropriate columns as indicated on the attached ENG Form 4288 (RMS) Instructions and return six (6) completed copies to the Contracting Officer for acceptance within 20 calendar days after the preconstruction conference. Upon acceptance of the ENG Form 4288 (RMS) by the Contracting Officer, the ENG Form 4288 (RMS) will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract period. The ENG Form 4288 (RMS) ACTIVITY NO. is filled in when a network analysis system is a contract requirement. The TRANSMITTAL NO. and ITEM NO. shall be left blank and used later to record the respective transmittal and item 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 submittal register and the progress schedules shall be coordinated. Updates to the submittal register showing the Contractor action codes and actual dates shall be submitted monthly or until all submittals have been satisfactorily completed. When the progress schedule

is revised, the ENG Form 4288 (RMS) shall also be revised and both submitted for approval.

1.10 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 conformance reviews by the Contracting Officer for submittals requiring Government review and for submittals which vary from the solicitation or accepted 100% corrected design. No delay damages or time extensions will be allowed for time lost in late submittals.

1.11 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting all 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.

1.12 SUBMITTAL PROCEDURES

Submittals shall be made as follows:

1.12.1 Procedures

1.12.1.1 "G-AE" Submittals

All "G-AE" submittals shall be reviewed and approved by the Contractor's Quality Control Representative and Contractor's Designer prior to submittal to the Government. A conformance review is required by the Government on all "G-AE" submittals, prior to construction of the related items.

Except as noted below, data for all items listed as "G-AE" Submittals in the various sections shall be submitted in seven (7 copies). All seven (7) copies shall be submitted 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 seven (7) copies of the transmittal form.

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.

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 provided. 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.

1.12.1.2 "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. All five copies shall be submitted to the Area Engineer for solicitation conformance review 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 three (3) copies. All three copies shall be submitted 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 three (3) copies of the transmittal form.

All "G-AO" and "FIO" submittals shall be reviewed and approved by the Contractor's Quality Control Representative and Contractor's Designer prior to submittal to the Government. A completed Government conformance review is required on all "G-AO" submittals, prior to construction of the related items.

The Government has the option to review any For Information Only submittals.

1.12.1.3 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.

1.12.1.4 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.

1.12.1.5 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 to the Area Engineer for approval (after approval by the Contractor's Quality Control Representative), 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. If field testing requires these copies to be revised, they shall be updated and resubmitted for review 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.

1.12.1.6 Interior/Exterior Finish Sample and Data

All submittals regarding color boards (Section 09915 COLOR SCHEDULE) for interior finish samples and data shall be submitted concurrently and all submittals for exterior finish samples and data shall be submitted concurrently. These color boards are in addition to the samples required under the specfic technical specifications listed as "samples".

1.12.2 Variations

Variations from the solicitation (contract requirements) or the accepted 100% corrected design must be approved by the Contractor's Designer, Contractor's Quality Control Representative and Contracting Officer. For submittals which include proposed variations, the column "variation" of ENG Form 4025 shall be checked and a serial letter shall be simultaneously prepared and sent to the Area Engineer referencing this variation. The Contractor shall set forth in writing the reason for any variations and clearly annotate such variations on the submittal. The narrative shall include documentation of the nature and features of the variation and why the variation is desirable and beneficial to the Government. When submitting a variation for acceptance, the Contractor warrants that the contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of the work. The Contractor shall take actions and bear the additional costs, including review costs by the Government, necessary due to the proposed variation. In addition to the submittal review period specified above, allow ten (10) additional working days for consideration by the Government of submittals with variations. The Government reserves the right to rescind inadvertent action codes of submittals containing unnoted variations.

1.13 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."

1.14 SUBMITTALS (FINAL COPY)

Upon completion of review of submittals requiring Government conformance review or approval, the submittals will be identified as having received satisfactory review by being so stamped and dated.

1.14.1 "G-AE" Submittals

The Contracting Officer has the option to review any submittal. Two (2) copies of "G-AE" submittals, for conformance review by the Government, 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. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. All "G-AE" submittals shall be reviewed and approved by the Contractor's Designer and Contractor's Quality Control Representative prior to submittal to the Government.

1.14.2 "G-AO" Submittals

Two (2) copies of "G-AO" submittals for conformance review 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.

1.15 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of 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.

1.16 STAMPS

Stamps used by the Contractor's Designer and the Contractor's designated Quality Control person on the submittal data to certify that the submittal meets contract requirements shall be similar to the following (use two stamps for submittals reviewed by both):

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 Residential Management System (RMS)software for tracking construction submittals. The Submittal Register information, columns (c) thru (f) from the Contractor generated Submittal Register, [will be utilized by the Government] to generate the ENG Form 4288 (RMS). [The Government will furnish the Contractor a hard copy of the ENG Form 4288 (RMS) at the preconstruction conference.]. The ENG Form 4288 (RMS) includes the following items and parties responsible for completing the information required on the ENG Form 4288 (RMS). The subparagraph headings below do not correspond to the Submittal Register column headings.

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 Contractor from the Submittal Register from column entitled "Specification Paragraph Number".

d. Description of Submittal: will be provided by the Contractor from the Submittal Register from column entitled "Description of Item Submitted".

e. Type of Submittal: will be provided by the Contractor from the Submittal Register from column entitled "Type of Submittal" or "Description of Item Submitted".

f. Classification: will be provided by the Contractor from the Submittal Register from column entitled "Classification".

g. Reviewing Office - Reviewer: will be provided by the Contractor 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 and/or Contractor's Designer. 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. For this design-build soclicitaion, unless noted otherwise by the Contracting Officer, the Action Codes for this form, when used by the Government, will be one of the following:

A - Reviewed for conformance. No except taken
B - Reviewed for conformance. Exceptions as noted.
C - Reviewed for conformance. Exceptions as noted. Refer to attached ____ sheet resubmission required.
D - Will be returned by separate correspondence.
E - Reviewed. Does not comply (See Attached). Resubmission required.
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-AE - Approved by Contractor's Designer, Contractor's Quality Control Representative and Conformance Review by the Government, as applicable. Approval by the Contractor's Designer means that the submittal complies with Construction Set design submittal.

G-AO - Approved by Contracor's Quality Control Representative and Designer and conformance review by the Government.

For Information Only - All other submittals without a G-AO or G-AE abbreviation code, Approved by Contractors Quality Control Representative and/or Designer. The Government reserves the right review any submittal for conformance with the solicitation.

INSTRUCTIONS
ENG FORM 4025

1. DATE at the top of form will be the date submitted to the DOR which is to be completed by the Contractor.

2. TRANSMITTAL NO. Each new transmittal (i.e. [G-AE,] [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 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).

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., DACXXX-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.

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. Once a number is assigned to an item it will remain the same even if there is a resubmittal.

10. Column b, will be completed by the Contractor. The description of each item on this form will be the descriptions provided on the 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-XX).

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 and/or Contractor's Designer. 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. 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. For this design-build soclicitaion, unless noted otherwise by the Contracting Officer, the Action Codes for this form, when used by the Government, will be one of the following:

A - Reviewed for conformance. No except taken.
B - Reviewed for conformance. Exceptions as noted.
C - Reviewed for conformance. Exceptions as noted. Refer to attached ____ sheet resubmission required.
D - Will be returned by separate correspondence.
E - Reviewed. Does not comply (See Attached). Resubmission required.
F - Receipt Acknowledged.
Fx - Receipt acknowledged, does not comply as noted with contract requirements.
G - Other (specify).

18. REMARKS box self explained.

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 Contractor, unless approval is required by the Government.

See reverse side of ENG Form 4025 for additional instructions.

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
FIRE STATION, FORT CARSON, CO

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							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)
		00800	SD-02 Shop Drawings															
			Equipment Room Drawings	1.45	G	RE												

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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.	E	--	Disapproved (See attached).
B	--	Approved, except as noted on drawings.	F	--	Receipt acknowledged.
C	--	Approved, except as noted on drawings. Refer to attached sheet resubmission required.	FX	--	Receipt acknowledged, does not comply as noted with contract requirements.
D	--	Will be returned by separate correspondence.	G	--	Other (*Specify)*

10. Approval of items does not relieve the contractor from complying with all the requirements of the contact plans and specifications.

(Reverse of ENG Form 4025-R)

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SECTION 01332

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11/02; Rev 01/03

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SECTION 01332

DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES
11/02; Rev 01/03

PART 1 GENERAL

Attachments: Attachment A, Design Certification and Transmittal Letter
DD Form 1354 - Transfer and Acceptance of Military Real Property
Instructions for Preparation of DD Form 1354

1.1 SUMMARY

1.1.1 Section Includes

a. Design

This section includes general requirements for developing and submitting a design including preparation of drawings, specifications, design analyses and other design deliverables conforming to the requirements contained in this section. Distribution requirements for design deliverables is also covered in this section. See Section 01336 60 PERCENT DESIGN REQUIRMENTS and Section 01338 100 PERCENT DESIGN REQUIREMENTS for specific requirements.

b. Construction

This section includes distribution requirements for the construction set of design deliverables and distribution requirements for DD Form 1354 and as-built drawings.

1.1.2 Section Excludes

This section does not include requirements for construction submittals which are specified in Section 01330, "Submittal Procedures."

1.2 REFERENCES

The references listed below form a part of this specification to the extent referenced.

1.2.1 THE CONSTRUCTION SPECIFICATIONS INSTITUTE (CSI)

CSI Masterformat Master List of Section Titles and Numbers

1.2.2 OMAHA DISTRICT CADD STANDARDS MANUAL

(a) Omaha District Microstation CADD Standards, which includes Microstation and Adobe Acrobat files regarding blocks, cells, fonts, standard drawings and standards, will be made available to the successful offeror. See Section 01040 AS-BUILT DRAWINGS and folder on solicitation CD-ROM labled "CADDSTD" file named "CADDSTD.PDF" for a summary of Omaha District Microstation file requirements. The Contractor shall be responsible for furnishing the required CAD software.

(b) Corps of Engineers Civil Standards.

Corps of Engineers Civil Standards (Adobe Acrobat .pdf format) are included on the solicitation CD-ROM and is located under the folder "CADDSTD"

file: civilstd.pdf

Microstation Civil Standards are available at:

ftp://aecadd@ftp.nwo.usace.army.mil/ae/ under folder labeled "Standard Drawings". This ftp is password protected. The successful offeror will be given access rights to this ftp site.

1.2.3 WEB SITES

In addition to the web sites listed in this section, other RFP Sections may list web sites where design criteria references used in this solicitation package may be found.

NOTE: FOR ITEMS (a), (b), AND (c) BELOW, REFERENCES TO RECEIVING APPROVAL FROM OTHER GOVERNMENT AGENCIES FOR ALTERNATIVE DESIGNS ARE NOT APPLICABLE TO THIS PROJECT. THE CONTRACTOR IS THE DESIGNER WHEN READING THESE DOCUMENTS.

ALL ITEMS LISTED BELOW ARE CONSIDERED TO BE A PART OF THE RFP SOLICITATION DOCUMENT (AS APPLICABLE) AND THE RESULTANT CONTRACT.

(a) TECHNICAL MANUALS (TM), TECHNICAL INSTRUCTIONS (TI), AIR FORCE MANUALS (AFM), ENGINEERING TECHNICAL LETTERS (ETL), ARMY ARCHITECTURAL AND ENGINEERING DESIGN CRITERIA (AEI), SUSTAINABLE DESIGN DOCUMENTS, AND MILITARY HANDBOOKS (MIL HNDBK) can be obtained from the National Institute of Building Sciences Construction Criteria Base (CCB) on CD-ROM. Contact the CCB directly at (202) 289-7800 for an order form or obtain an order form at the following internet address: http://www.ccb.org/ccbsubscribe/Subsmain.asp. There is a regular annual subscription fee to the CCB (Price is noted on internet address, currently $700 per year). The CCB is available on CD-ROM or DVD. Selected references are also available for downloading in Acrobat .pdf file format at the following internet address:

http://www.hnd.usace.army.mil/techinfo.

Additional web sites are as follows:

(1) TECHNICAL MANUALS, ETL's, ETC.:

www.usace.army.mil/inet/usace-docs

Click on "Information", then the desired publication.

(2) AIR FORCE DESIGN CRITERIA:

http://afpubs.hq.af.mil

(3) UNIFIED FACILITIES GUIDE SPECIFICAITONS (UFGS)

This includes UFGS sections referenced, but not provided in the solicitation and other UFGS sections required in developing the project specifications. Unless noted otherwise these Guide sections are located on the CD-ROM issued with solicitation (Specsintact files under a directory labeled "Guides" An Index of available UFGS sections is included in Attachment No. 3 of this RFP.

Specsintact software is available on the CCB referred to paragraph (a) above or may be downloaded at the following internet address:

http://si.ksc.nasa.gov/specsintact/software/software.htm

SI Version 3.0 (Version SI3.3.460) or later shall be used. The new unified submittal format shall be selected for file format. A copy of the software (SI Version 3.0) has been included on the CD-ROM issued with this solicitation. See folder: "Software", file "si3.exe".

1.3 DEFINITIONS

1.3.1 Contractor

Firm or company to whom award was made to design and construct the Main Fire Station, located at Fort Carson, Colorado.

1.3.2 Design

Documents or deliverables, as defined in this section, prepared by or under the direct supervision of registered professional architects and engineers and proposed by the Contractor to meet the requirements of this solicitation.

1.3.3 Design Drawings

Documentation showing in graphic and quantitative form the extent, design, location, relationships, and dimensions of the construction to be provided by the Contractor. (Note: Shop Drawings, as defined in Section 01330, "Submittals Procedures" are not to be provided until after design drawings are determined satisfactory for construction.)

1.3.4 Designer

Architects and Engineers (A-E) associated with the Contractor who are responsible for (1) preparing the design documents, (2) checking construction submittals, considered extensions of design (A-E), for compliance with the prepared Construction set design documents and (3) have the qualifications and experience specified herein.

1.3.5 Request for Proposal (RFP)

Documents furnished to prospective offerors containing proposal information and specifying criteria and project requirements for design and construction of a Main Fire Station located at Fort Carson, Colorado. The documents include this specification, attachments, and the RFP drawings.

1.4 QUALITY ASSURANCE

1.4.1 Construction Personnel Experience

The Contruction Personnel experience shall be as submitted per the requirements of Section 00110 PROPOSAL SUBMISSION, EVALUATION, AND CONTRACT AWARD. If, because of reasons beyond the control of the construction firm, the named individuals are not able to fulfill this obligation, replacement personnel with similar skills and experience shall be presented for acceptance by the Contracting Officer. The Contractor shall obtain the Contracting Officer's wrtitten consent before making any substitution for these designated personnel.

1.4.2 Designer Qualifications and Experience

The designer qualifications and experience shall be as submitted per the requirements of Section 00110 PROPOSAL SUBMISSION, EVALUATION, AND CONTRACT AWARD. If, because of reasons beyond the control of the design team, the named individuals are not able to fulfill this obligation, replacement personnel with similar education and experience shall be presented for acceptance by the Contracting Officer. The Contractor shall obtain the Contracting Officer's wrtitten consent before making any substitution for these designated personnel.

1.5 SUBMISSION OF DESIGN DRAWINGS, SPECIFICATIONS AND DESIGN ANALYSES

1.5.1 Design Certification

Within each design submittal, the Contractor shall certify that all items submitted in the design documents (after construction award) comply with Division 1 specifications and mandatory requirements of the UFGS and designated CEGS. The criteria specified in this RFP are binding contract criteria and in case of any conflict, after award, between the RFP criteria and Contractor's submittals, the RFP criteria will govern unless there is a written and signed agreement between the Contracting Officer and the Contractor waiving a specific requirement. The Contractor shall present with the letter of transmittal for each design submittal (including the 100% corrected design (backcheck) submittal) a certification that the submittal (plans, specifications, design analysis, etc.) complies with the requirements stated above, similar to that shown at Attachment A of this section.

1.5.2 Deviations

Deviations from the RFP technical requirements shall be identified in the letter of transmittal and design certification letter. Deviations from the RFP technical requirements will be considered and accepted by the Contracting Officer, if the changes results in a significant improvement to the project or it exceeds the minimum RFP technical requirements.

1.5.3 Field Inspection

The Contractor shall verify field conditions which are significant to design, by field inspection, researching and obtaining all necessary existing facility as-built drawings and reproducing them for his own use as necessary, and discussing status with knowledgeable personnel. The information shall be reflected in the design documents.

1.5.4 Drawings

1.5.4.1 Software Requirements

All design drawings shall be done by the Contractor using Microstation

J.dgn file format. Format shall conform to the Omaha District CADD Standards and the Omaha District CADD Design File and Sheet Naming Conventions. See Omaha District CADD Standards requirements listed above.

1.5.4.2 RFP Drawings

The drawings furnished with this solicitation will be furnished to the Contractor in Microstation J file format within 30 calendar days of contract award.

1.5.5 Design Documents

Design documents, as required by the 60 percent and 100 percent design submittals stated hereafter, shall include construction drawings, specifications, design analysis, and other design deliverables for categories such as, but not limited to, architectural, interior design, structural, mechanical, electrical, grading, drainage, paving, and outside utility services. Specifications shall be in sufficient detail to fully describe and demonstrate the quality of materials, the installation and performance of equipment, and the quality of workmanship. Detailing and installation of all equipment and materials shall comply with the manufacturer's recommendations. The design analysis shall be for each discipline of work and shall include all features with the necessary calculations, tables, methods and sources used in determining equipment and material sizes and capacities, and shall provide sufficient information to support the design.

1.5.6 Design Reviews

A minimum of two design reviews during design will be held at Fort Carson Army Installation at the 60 percent and the 100 percent completion stages of the final design. A backcheck review will be made on the Corrected 100 percent design. Once that the Corrected 100 percent design is reviewed and determined to be satisfactory for the purpose of beginning construction, the Contractor shall prepare and distribute sets of documents for construction. The Contractor shall attend the design reviews, visit the site and make other trips as necessary during the design to accomplish the work.

1.5.7 Document Packaging

The 60 percent design submittal includes the 60 percent complete site and utility design and building design. These documents shall be packaged and stamped "For Review Only - 60% Design"; and each sheet of the drawings shall also be stamped. The 100 percent design submittal includes 100 percent complete site and utility design and building design and shall be stamped "For Review Only -100% Design", and each sheet of the drawings shall also be stamped. The backcheck design submittal(s) after the Government review of the 100 percent complete site and utility design and building design shall be stamped "100% Corrected Design"; and each sheet of the drawings shall also be stamped. The 100% Corrected Design submittal is for making corrections resulting from review comments and for preparing the

final project documents. No additional time for completion of the contract will be granted to the Contractor due to insufficient design submittals. See paragraph 3.7.6 "Government Design Review and Acceptance" for additional requirements.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 DRAWINGS

Prepare, organize, and present drawings in the format specified herein. Provide drawings complete, accurate and explicit enough to show compliance with the RFP requirements and to permit construction. Drawings illustrating systems proposed to meet the requirements of the RFP performance specifications shall reflect proper detailing for each such system to assure appropriate use, proper fit, compatibility of components and coordination with the design analysis and specifications required by this section. Coordinate drawings to ensure there are no conflicts between design disciplines and between drawings and specifications. For specific drawing requirements, see Sections 01336 60 PERCENT DESIGN REQUIREMENTS and 01338 100 PERCENT DESIGN REQUIREMENTS. The following subparagraphs cover general drawing requirements.

3.1.1 Drawings Format

Full size drawings are considered 28 inches x 40 inches. Half-size drawings are considered 14 inches x 20 inches. Title block shall be as indicated in the Omaha District CADD Standards Manual. Recommended drawing scales are specified in Sections 01336 60 PERCENT DESIGN REQUIREMENTS and 01338 100 PERCENT DESIGN REQUIREMENTS. The Cover Sheet of the Contractor prepared drawings shall bear the stamp or seal and signature of the registered architect or appropriate engineer responsible for the work and proposed to meet the RFP requirements. Drawing code numbers for the design and construction drawings shall be as follows:

F 730-10-03

3.1.2 Drawings Sequence

Arrange drawings by design discipline in accordance with Omaha District CADD Standards Manual.

3.1.3 Drawings Required

As a minimum, the Contractor shall prepare and submit the following design drawings:

a. Title Sheet, Index of Drawings, Legend and Abbreviations and Soil Borings.

b. Civil Drawings

c. Utility Drawings (Water Supply, Wastewater, Gas, and Electrical)

d. Architectural Drawings

e. Interior Design Drawings

f. Structural Drawings

g. Mechanical Drawings

h. Plumbing drawings

i. Electrical Drawings

j. Fire Protection Drawings

3.2 SPECIFICATIONS

The Contractor shall develop project specifications utilizing the Division 1 Specifications furnished with this RFP; unedited Unified Facilities Guide Specifications (UFGS); designated specification sections furnished with this RFP; and the development of additional project specifications not covered by UFGS. Guide specifications are located on the CD-ROM issued with this solicitaton.

The Contractor shall utilize Specsintact software.

Minimum and recommend hardware requirements are as follows:

MINIMUM REQUIREMENTS	RECOMMENDED REQUIREMENTS
486 (Windows 95/98/ME/NT/2000) Pentium NT/2000	Pentium 133 - Windows 95/98/ME Pentium 266 NT/2000
16MB RAM (Windows 95/98) 32MB RAM (Windows NT/ME) 64MB RAM (Windows 2000)	32MB RAM (Windows 95/98) 64MB RAM (Windows NT/ME) 128MB RAM (Windows 2000)
24MB (local) 56MB (Network) Free Hard Drive Space	50 MB (local) 75 MB (Network) Free Hard Drive Space
SVGA Monitor	SVGA Monitor with 800 x 600 resolution
3 1/2 inch 1.44 MB floppy drive	3 1/2 inch 1.44 MB floppy drive
CD ROM Drive	CD ROM Drive
Laser Printer	Laser Printer

Note: Additional Hard Drive space is required for storing project specifications and masters.

a. Technical Specifications

The Contractor shall be required to use unedited UFGS and designated unedited CEGS sections for developing project specifications. Specification paragraphs and subparagraphs shall not be rewritten to lessen the quality of the original technical specification sections, unless directed otherwise. The technical guide specifications describe the type and quality of material and installation normally acceptable for Corps of Engineers Construction, and often represent specific agreement between the Corps and the applicable industry. The provision of the technical guide specification should not be changed without justification. Justifications and identification for additional materials shall be identified in the

design analysis under the appropriate design discipline. Designer notes shall not appear in any design submittals. Only bracketed choices and inapplicable items shall be marked for deletion. These items shall be removed in corrected 100 percent specifications submittal. The Contractor shall complete the editing of all options in these specifications. Where designer notes are provided, the Contractor shall edit the choice in accordance with the recommendations and guidance of the Notes, except where specific guidance has been provided with this RFP (i.e. submittal paragraph). See additional requirements in Sections 01336 60 PERCENT DESIGN REQUIREMENTS and 01338 100 PERCENT DESIGN REQUIREMENTS.

b. Editing Technical Specifications (Designated CEGS or UFGS)

(1) Incorporating Established RFP Requirements into Guide Specifications

Where specific requirements in regards to materials, methods and end function requirements are provided in the edited RFP Division 1 and Attachments provided in this RFP, the unedited Unified Facilities Guide Specifications (UFGS) and designated unedited CEGS (Omaha) shall be edited to reflect these requirements. Variations to these requirements will not be permitted, unless authorized as a design deviation by the Contracting Officer.

(2) Requirements of Guide Specifications Not Established By RFP Requirements

Where specific direction has not been provided in regards to materials, methods and end function requirements, the final requirements will be a result of the completed design by the Contractor.

Option 1- Not Allowing Contractor to delete applicable text

The applicable unedited UFGS and designated CEGS (Omaha) Sections, Divisions 2 through 16, provide requirements for a variety of materials and systems. Deleting applicable requirements from these specifications will not be permitted, unless accepted as a design deviation by the Contracting Officer.

Option 2 - Allowing Contractor to delete applicable text, as required

The applicable unedited UFGS and designated CEGS (Omaha) Sections, Divisions 2 through 16, shall be edited to:

a. Provide the highest quality that can be provided within the cost and time authorized;
b. Meet or exceed the criteria requirements established by the solicitation;
c. Meet applicable Federal, State and Local Codes; and
d. Do not sacrifice aesthetics, user requirements established by the solicitation, life-cycle economy, energy conservation, environment protection or life safety.

Lessening the quality of the UFGS specifications shall not be made unless the Contractor provides the Contracting Officer documentation as to why the standards established by the UFGS and designated CEGS (Omaha) Sections cannot be made (See editing requirements above). This documentation shall be included as a design deviation. See Paragraph: DESIGN CERTIFICATION below.

(3) ADDITIONS: If the specifications of the UFGS or designated CEGS does not cover a feature that is in the project, new sentences and/or paragraphs shall be inserted in the proper locations to adequately cover the feature of work. Additions shall not lesson the quality of materials indicated by the specifications. If a new material is added, it shall be properly referenced in "Applicable Publications," "MATERIALS," "SUBMITTAL," "TESTS," and "INSTALLATION" paragraphs, as applicable.

(4) DELETION OF INAPPLICABLE TEXT MATERIAL, AS NECESSARY, TO TAILOR THE SPECIFICATIONS TO FIT THE PROJECT: After deletion has been made to all inapplicable paragraphs, subparagraphs, choices, and schedules from the body of the specifications (including but not limited to the correction of lists in "Submittals," "Tests," and "Installation" paragraphs), delete all nonapplicable references listed in the preceding "APPLICABLE PUBLICATIONS" and "MATERIALS" paragraphs. Deletions shall not lesson the quality of materials indicated by the specifications.

(5) Do not remove any special code markings for submittals, references, tests or section references, unless the text is not required.

(6) REFERENCES TO SPECIFICATION SECTIONS. The Contractor shall be responsible for coordinating section references, along with the technical requirements, to specific specification sections (number and title) within the project specifications. Section references (title and number) shall be revised to reflect the titles and numbers of specification sections used.

(7) REFERENCES. The Contractor shall be responsible for coordinating references or publications referenced in the text of each specfications with those references listed at the beginning of each section. See paragraph: Reports below. The Specsintact Software removes references or publications not referenced in the text from the Reference Article, when printing from the Jobs menu.

(8) SUBMITTALS. Each section of the specifications includes a submittal paragraph which lists all applicable Contractor submittals.Submittals shall be properly marked as outlined in the Specsintact documentation and in this section. These codings are used for automatic generation of the Submittal Register in the Specsintact Software. These codings must NOT be deleted from the text, unless the submittal is not required. The Submittal Item text between the coding shall be identical (word for word, including punctuation and spacing) to the paragraph text in the reference paragraph(s). Text may be either upper or lower case letters. An example of an submittal paragraph is listed below with text telling what each item stands for directly below each listing.

"1._ SUBMITTALS

Government review 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

Fire Sprinkler Design Drawings; G-AE

SD-03 Product Data

Meters;

Regulators

SD-08 Manufacturer's Instructions

Dielectric Unions

Pressure Reducing Valves

See Section 01330: SUBMITTAL PROCEDURES for the list of Submittal Descriptions and Numbers and for submittal classification and further explanation of the submittal process.

Submittal Classifications (G-AE, G-AO, and FIO) are as follows:

G-AE - G-AE submittals are those that involve extensions of design (those that show design work performed by the Construction Contractor not previously included in the 100% Corrected for Construction drawings to include color boards and finish samples for major finishes such as paint, floor coverings, wall coverings, etc), or changes/variation in design. These submittals require knowledge of the design and must be reviewed and approved by the Contractor's Designer of the responsible design organization. The Government will review all G-AE approved submittals for conformance to the Solicitation. The Government will review all submittals designated as deviating from the Solicitation or completed design.

Typical G-AE type submittals:

Extensions of Design:

Note, for the following examples, the responsible designer will determine the criticality of each "extension of design" submittal and may, with the concurrence of the field office, change the review office to the field office.

1. Structural steel
2. Lawn irrigation systems
3. Concrete reinforcement
4. Millwork/casework
5. Masonry reinforcement
6. Fire Sprinkler Systems
7. Fire Detection Systems
8. Interior signage
9. Cathodic protection
10. Asbestos abatement layouts
11. Control systems
12. Security systems
13. Interior / Exterior Finishes
14. Furniture Systems
15. Pavement Concrete mix designs (special use - non routine, e.g., Airfield Paving)

16. Asphalt mix designs (special use - non routine, e.g., Airfield Paving)
17. Color boards
18. Finish samples for major finishes

Changes/Variation to Design:

· Design changes in material or function to the design

G-AO - G-AO submittals are those that need to be reviewed for conformance to the contract by either the Area or Resident Office (as directed). In general, G-AO submittals are those involving test procedures/reports, minor finish samples such as caulking and sealants, toilet accessories, etc and O&M Manuals and related information. In addition, G-AO submittals would include items which vary from the Solicitation package or 100% Corrected Design and other items as designated by the Contracting Officer's Representative. Submittals shall be reviewed and approved by the Contractor's Quality Control Representative and Designer (if applicable), prior to submittal to the Government. Typical G-AO submittals are listed below.

· All Testing, Adjusting, and Balancing (TAB) submittals
· All System type testing procedures and acceptance reports (e.g., Fire Detection, Fire Protection, Security/Communication Systems, etc.)
· All O&M Manuals
· Other final operational type submittals such as Spare Parts Data, Framed Instructions, Warranty Information, etc.
· Training plans and schedules for Systems Training
· Minor finish samples

FIO - For Information Only. These submittals do not compliance review by the Government. These submittals shall be approved by the Contractor's Quality Control Representative and/or Designer, prior to submittal to the Contracting Officer's Representative. NOTE: "FIO" IS ANY SUBMITTAL ITEM THAT DOES NOT HAVE A "G-AE" OR "G-AO" CLASSIFICATION. SEE PARAGRAPH BELOW ON HOW TO CORRECTLY IDENTIFY A FIO SUBMITTAL.

For each submittal requirement in the Guide specification, designers shall indicate a submittal type (G-AE, G-AO, or FIO) or shall delete the requirement for the submittal. To designate a submittal item as FIO, mark the semi-colon following the submittal item and also the submittal tags up to the Item tag for deletion (i.e. "; [ ], [ ]"). Designers shall identify submittal classifications for all required submittals.

(9) USE OF UFGS SECTIONS

UFGS sections are joint effort of the U.S. Army Corps of Engineers (USACE), the Naval Facilities Engineering Command (NAVFAC) and the Airforce Civil Engineer Support Agency (AFCESA). Unless directed to otherwise, use UFGS sections. Available UFGS sections include sections that have a 5 digit section number with either the letters "A" or "N" following the section number or no letter following the section number. The letters designate the specification proponent ("A" is for USACE and "N" is for NAVFAC). The Contractor shall use sections with the letter "A" following the section number or sections with no letter following the section number. Sections with the letter "N" following the section number shall not be used unless there is no other available section, the solicitation directs the use of these sections or the

available sections do not meet the solicitation requirements. Do not use Division 1 Sections that have the letter "N" following the section number. Where UFGS sections include tailoring options for both Army and Navy, use the Army tailoring option. Where conflicts exist that cannot be resolved, the Contracting Officer shall be contacted to resolve the issue.

c. Developing Additional Project Specifications.

If the need should arise for developing project specifications on materials/items not covered in by the UFGS or desginated CEGS, the Contractor shall develop specifications utilizing commercial Construction Specifications Institute (CSI), 16 Division, 3 Part Section Format. These specifications shall conform to the applicable criteria requirements indicated in the solicitation. For these specification sections, write at the Mediumscope level of detail as described in CSI Masterformat. Use Mediumscope level section numbers and titles as identified in CSI Masterformat. Adjust section numbers which conflict with the specifications used in the Project Specifications. Each of these developed specification sections shall be in the same format as the CSI format specifications included in the UFGS (including the submittal paragraph). Commercially available guide specifications such as "SpecText" published by The Construction Specifications Institute and "MasterSpec" published by The American Institute of Architects or Unified Facilities Guide Specifications (UFGS) may be used, subject to the format, coding and submittal paragraph requirements. References to the "Architect/Engineer" and the "Owner" shall be changed to refer to the "Government" or "Contracting Officer," as appropriate. The specifications shall clearly identify, where appropriate, the specific products chosen to meet the requirements of the specifications (manufacturers' brand names and model numbers or similar product information). The Contractor shall be responsible for coordinating references, along with the technical requirements, to specific specification sections (number and title) within the project specifications. Section references (title and number) shall be revised to reflect the titles and numbers of specification sections used.

d. Division 1 Sections

Include Division 1 specifications sections (01040 AS-BUILT DRAWINGS, 01200 WARRANTY OF CONSTRUCTION, 01320A PROJECT SCHEDULE, 01330 SUBMITTAL PROCEDURES, 01355 ENVIRONMENT PROTECTION, 01451A CONTRACTOR QUALITY CONTROL, and 01565 (FEDERAL FACILITIES COLORADO) NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES) contained in the RFP as part of the project specifications without change. Copies of these sections and other Division 1 specifications included with the RFP will be furnished (upon request) to the successful offeror in Specsintact. Any other Division 1 Specifications required by the Contract shall be the responsibility of the Contractor. No other Division 1 Specifications willl be required, unless specified otherwise in this solicitation or required by the Contractor.

3.2.1 Format for Project Specifications

Submit the project specification, including a Cover page and Table of Contents, printed with a word processor (Using Specintact software) using good quality white paper. For the 60 percent and 100 percent design submittals, editing of the CEGS and UFGS shall be shown as indicated in the Specsintact documentation for text deletions and for text insertions. The corrected 100 percent specifications with review comments incorporated shall be cleaned up (markings for insertion and deletion removed) and

submitted in both hard copy and on magnetic media (A Microsoft Windows compatible CD-ROM and compatible with the "Specsintact " micro computer software package.). The Cover page and attachments to specification sections shall be prepared in a Microsoft Word (compatible with Microsoft Word 97) format. Carbon copies are not acceptable.

Format shall be as outlined in the Specsintact documentation.

Each specification section shall include a Section Table of Contents which is combined with the page numbering of the specification section.

The Cover page shall be similar to the RFP Cover page and shall include:

a. Project title, Project Number, activity and location

b. Construction contract number

c. Construction Contractor's name and address

d. Design firm's name and address

e. Names of design team members (Designers of record) responsible for each Contractor prepared technical discipline of the project specification

f. Name and signature of a Principal of the design firm

The Table of Contents shall list the 16 Divisions contained in CSI format and the specification section numbers and titles contained in the project specification.

3.2.2 Reports

The Contractor shall submit the following Specsintact reports with the 100 percent and Corrected 100 percent design submittals: Address Verification, Reference Verification, Section Verification, Bracket Verification, Submittal Verification, Submittal Register and any other reports requested by the Contracting Officer. References shall be reconciled when printing reports. The reports to be submitted for review shall be after the Contractor has corrected the errors generated by these reports. From the errors generated by the reference verification reports, fix only those errors where there is a discrepancy with the issue date of a publication (i.e., NFPA 70, revise to the latest code requirement). Address, Reference and Submittal Reconcilation shall be completed prior to submittal of the 100 percent design.

3.2.3 Construction Submittals

All construction submittals shall be in accordance with Section 01330, "SUBMITTAL PROCEDURES".

Construction submittal types and products, including the submittal description numbers and data package numbers, shall be included in the specification sections, where required. When appropriate, use specific product terms instead of the generic product terms contained in the specifications sections (e.g., asphalt shingles, built-up roofing, EPDM single ply, etc. vs roof covering; concrete masonry units, brick, metal siding, etc. vs exterior skin; mineral fiber board, block, batt or blanket, polystyrene, polyurethane, polyisocyanurate board vs insulation).

3.2.3.1 Submittals Register (Form)

Prepare and maintain a Submittals Register. The Submittal Register (ENG Form 4288 "Submittal Register" shall be prepared using Specsintact Software. Additional instructions for completing the form are contained in Section 01330, "Submittal Procedures."

Fill in columns "c" through "f" and submit with the 100 percent design submittal. The Submittal Register will be returned to the Contractor along with the reviewed and accepted design.

Resubmit the Submittal Register as a construction submittal as required in Section 01330, "SUBMITTAL PROCEDURES." The Contracor shall provide an electronic copy of the accepted submittal register (navy4288.txt file), generated by the Specsintact software, three (3) working days prior to the pre-construction conference. Remaining columns will be filled in at the appropriate time and by the appropriate authorities during construction.

3.3 DESIGN ANALYSES

Prepare design analyses (basis of design and calculations) for each design discipline. Specific requirements relative to the technical content to be provided are specified herein and in Section 01336 60 PERCENT DESIGN SUBMITTALS and Section 01338 100 PERCENT DESIGN SUBMITTALS. The design analyses shall include a basis of design and calculations for each discipline. The design analyses shall be a presentation of facts to demonstrate that the concept of the project is fully understood and that the design is based on sound engineering. The design analysis for each discipline shall include:

a. A basis of design consisting of:

(1) An introductory description of the project concept which addresses the salient points of the design;

(2) An orderly and comprehensive documentation of criteria, rationale, assumptions and reasoning for system selection.

b. Calculations required to support the design.

c. Project Engineering Considerations and Instructions (ECI) for Final Design Analysis.

The Contractor shall not make reference to the RFP solicitation to avoid stating the requirements for the basis for design.

3.3.1 Format

The design analysis shall include: a cover page indicating the stage of design "PRELIMINARY DESIGN ANALYSIS": for 60 percent design submittal and "FINAL DESIGN ANALYSIS" for 100 percent design submittal, the project title "FY 03 MAIN FIRE STATION, PROJECT NO. 12365", fiscal year and program funding "FY 03 MCP", location "FORT CARSON, COLORADO", who prepared the design analysis "Prepared By:" followed by Name of AE and Construction Contractor, location of AE and Construction Contractor Office involved with the design, and construction contract number; table of contents; and tabbed separations for each part of design analysis for quick reference. The cover sheet shall indicate the volume number and total number of volumes

for the project. Provide a cover sheet for each volume. Submit design analyses prepared on 8 1/2 by 11 inch white paper. The design analysis for all disciplines shall be bound in one volume, excluding calculations. Multiple volumes for individual disciplines, appropriately numbered, may be provided, when required. For Electronic media requirements, see the NOTES for the Construction Set Distribution (paragraph 3.7.1.6). Narratives shall be provided in decimal paragraph numbering system (i.e. 1, 1.1, 1.1.1, 1.1.1.1 etc.). Narratives shall be an original document that does not copy the text from the RFP document sections, unless directed otherwise and shall be written in the same tense (Past or Present) for the entire design analysis. Each part of the design analysis shall include part number and page numbering (consecutive page numbering for each part). Organize design analysis narrative into the following parts, as follows:

3.3.1.1 Part 1 - General Description.

This part will provide statements of purpose, authority and applicable criteria. A description of the project and a summary of the economic factors influencing the choice of the civil, architectural, structural, mechanical, electrical, fire safety, water supply and wastewater disposal systems used in the project shall be provided along with an indication of how initial and life costs were considered.

a. Purpose. Include the following statement under the heading of "PURPOSE":

"The new fire station will consolidate and integrate various diverse functions necessary to support fire fighting capabilities at the Post, but that are currently spread out in separate inferior and undersized facilities. A new facility is required to provide a modern and more efficient atmosphere in which to perform fire firghting activities, adequately house fire fighters, administrative functions, and fire fighting equipment, and provide the required technical training. The anticipated staffing for this facility is approximately 19 people. The facility will provide adequate support for equipment, administrative support, vehicle dispatching, 911 Dispatch Center, and other support areas."

b. Authority. Provide the following authorization statement under the heading "AUTHORITY" for the project:

"The preparation of design documents was authorized by Design Directive # [____] dated [__ _____ 200_ ." (This information is to be provided by the Program/Project Manager

c. Applicable Criteria. Provide a list of the general criteria that pertains to all disciplines used in the design. Specific criteria used in a particular engineering/architectural discipline shall be listed in the text of the appropriate discipline in Part 2 of the design analysis. Such criteria shall be referenced accordingly.

d. Project Description. Provide a description of the project and summary of economic factors influencing the choice of materials and systems used in the project.

3.3.1.2 Part 2 - Design Requirements and Provisions.

This part of the design analysis shall provide statements of factors considered and provided in the design along with supporting justification of design decisions and design calculations. Include narratives for each

of the following areas or disciplines. See Sections 01336 60 PERCENT DESIGN REQUIREMENTS and 01338 100 PERCENT DESIGN REQUIREMENTS for specific requirements.

a. Civil

b. Water Supply and Wastewater

c. Architectural

d. Interior Design

e. Structural

f. Mechanical

g. Electrical

h. Fire Protection

i. Environmental Protection, Compliance and Permits

j. Health and Safety

k. Sustainable Design

3.3.2 Calculations

All calculations shall be placed in separate appendix volume(s). Calculations shall include a cover page similar to the design analysis narrative cover page, a table of contents, index page and a summary of criteria for each appendix on the first pages and the project title, and location identified on every page of the calculations. All calculation pages shall be clearly legible and photo-ready. Each discipline which requires calculations shall be consecutively numbered (Example: A-1, A-2, A-3 etc. for Water Supply and Wastewater Calculations and B-1, B-2, B-3, etc. for Structural Calculations) and the date. Cite criteria from which the calculations, rationale, and formulae are extracted by publication number, title, edition and page number. The cover page and each page of calculations shall also include the names of the persons originating and checking the calculations. The person checking the calculations shall be a registered professional engineer other than the originator. In addition, the signature and seal of the appropriate registered professional engineer responsible for the work shall appear on the cover page of the calculations for each discipline. Each appendix index page shall list subtopics (e.g. for Structural - Loads, Materials, References, Wind Analysis, Footing Design, Wall Design, Column Design, etc.) with pages numbers where each of these subtopics can be found in the calculations.

Computer printouts shall be consecutively page numbered and identified similar to the calculations. Identify the computer program name, source, and version. All schematic models used for computer input shall be provided.

3.3.3 Engineering Considerations and Instructions (ECI) for Field Personnel

3.3.3.1 Separate Appendix

Under a separate appendix in the Final Design Analysis, the Design-Build

Contractor shall include the following items:

a. Features critical to the quality of the final construction product requiring special attention.

b. Submittals requiring special attention during construction.

c. Special user requirements or instructions.

d. Assumed field conditions, pertinent significant aspects, or critical phases of the project used as a basis of project design.

3.3.3.2 Format

Format for ECI's shall include the following information:

"ENGINEERING CONSIDERATIONS AND INSTRUCTIONS

Project Name:_____

Location: _____

Designer Name:_____ Phone:_____

Discipline:_____

Design-Build designers have prepared the following engineering considerations and instructions (ECI). These ECI's should be followed during the construction of the above project. If you have any questions, contact the appropriate Design-Build designer."

3.3.3.3 Distribution of ECI's

In addition to including ECI's in a separate appendix of the final design analysis and after acceptance of the 100 percent corrected design and prior to the start of construction, the design-build Contractor shall e-mail a copy of the ECI's to the appropriate U.S. Army Corps of Engineer's Field representative for his consideration with a copy also sent to the appropriate individual in following office(s): CENWO-CD-QR and CENWO-PM-M. The Government will provide the names and e-mail addresses to the design-build Contractor at either the pre-design or pre-construction conference.

3.3.4 Requests for Information, Meeting Minutes and Comments

Copies of Requests for Information (RFI) made by the Contractor to the Government shall be included as an appendix to the design analysis. An index of each RFI, which documents the RFI number, the date RFI given to Government, the date the RFI is answered and the Action Response provided by the Government.

A copy of all meeting minutes and design review comments (if any) with action responses shall be included as an appendix to the design analysis.

Appendices for RFI's and Meeting Minutes and design review comments shall have page numbering that follows the same format as for Calculations listed above.

3.4 DESIGN CERTIFICATION

The Contractor shall provide certification signed by an officer of the Contractor's company attesting that the drawings, specifications and design analyses prepared for the construction of the facility meet the requirements of the RFP. The certification shall accompany the submission of the design documents along with names and disciplines for the designers of record. This design certification shall include a list of deviations (variations) from the solicitation or accepted final design. Prepare the design certification and transmittal letter in the format shown on Attachment A included at the end of this section.

3.5 60 PERCENT DESIGN SUBMITTALS

See Section 01336 60 PERCENT DESIGN REQUIREMENTS.

3.6 100 PERCENT DESIGN SUBMITTALS

See Section 01338 100 PERCENT DESIGN REQUIREMENTS.

3.7 REVIEW BY GOVERNMENT AGENCIES

3.7.1 Distribution of Design Documents for Conformance Review

(a) Government agencies shall receive review documents thirty (30) days prior to review conferences. The documents will be in their then-present "on-board" design status (except for the 100% design submittal). Agencies reviewing documents, and in the quantities indicated, are listed below. All documents must contain an index of contents. Work shall continue during the review period between the 60% design submission and the 60% design review conference. Work shall be 100% complete when the 100% design is submitted. Design work shall not continue during the review period between the 100% design submission and the 100% design review conference. All submittals shall be transmitted by **express mail.** Originals of transmittal letters should be sent to the Omaha District and copies should accompany each mail package. Transmittal letters shall indicate distribution by use of the "ATTN" code shown in the address. Design document set shall include the items listed below. Some of the Construction submittals are also listed. Design submittals shall be submitted as a complete package. The distribution listed below also applies to all design reviews and design package accepted for construction.

(b) If the Government requires more time than the thirty (30) days given, prior to either of the review conferences, the Contractor will be granted an extension of time equal to the number of calendar days of delay.

(c) The Government requires fourteen (14) days to review 100 Percent Corrected Design submittals after receipt of these documents. If the Government requires more than the days given, the Contractor will be granted an extension of time equal to the number of calendar days of delay.

3.7.1.1 Submittal Items

The submittal items listed below are intended to identify the different design submittals required throughout the design process and select submittals required during and at the completion of Construction. Each submittal item has an Abbreviation, which will be used in conjunction with the number of required copies. See paragraphs 3.7.1.3 through 3.7.1.7 for required copies for distribution.

SUBMITTAL ITEM - **ABBREVIATION**

Design Analysis Narrative - **DANar**
Design Analysis Calculations - **DACalcs**
Specifications - **Specs**
Specification Error Reports - **SpecER**
Submittal Register - **SubReg**
Drawings (1/2 size) - **Dwg-1/2**
Drawings (Full size) - Dwg-full
Meeting Minutes with Annotated Comments and Other Attachments - **MMin**
As-Built Drawings - **Asblt**
Electronic Media Drawings - **EMDwg**
Electronic Media Specifications - **EMSpecs**
Electronic Media Design Analysis - **EMDA**
Design Certification Letter - **DCLet**
Color Board - **ColBd**
DD Form 1354 - Transfer and Acceptance of Military Real Property - **DD1354**
Environmental Protection Plan - **EP Plan**
Engineering Considerations and Instructions - **ECI**
Renderings - **Rend**
Backcheck Review Comments - **Brvw Cmnts**

3.7.1.2 Activity Distribution Addresses

Engineering Division
Attn: CENWO-**PM-M** (Vincent Turner)
U.S Army Engineer District, Omaha
106 South 15th Street
Omaha, NE 68l02-1618

Construction Division
Attn: CENWO-**CD-Q**
U.S. Army Engineer District, Omaha
106 South 15th Street
Omaha, NE 68l02-1618

Rocky Mountain Area Engineer
Attn: CENWO-**CD-RM**
U.S. Army Corps of Engineers
1050 South Academy Boulevard, Suite 100
Colorado Springs, Co 80914-2370

Ft Carson Resident Office
PM Forward Attn: CENWO-CD-**RM-FC** (Steve Wong)
US Army Corps of Engineers
803 Tevis StreetBldg. 304, Room 120
Fort Carson, CO 80913-4010

Dept. Of Army Directorate of Public Works (DPW)
Attn: AFZC-**DPW-BW** (Bill Davis)
5050 Tevis St. Bldg. 305
Fort Carson, CO 80913

Director, USAISEC-FDEO
ATTN: AMSEL-IE-**DE-IN-CO**
Suite 228, MCA Cell
1435 Porter Street
Fort Detrick, Maryland 21702-5047

3.7.1.3 60 Percent Design Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

Activity / Submittal Item	PM-M	CD-Q	CD-RM	CD-RM-FC	DPW-BW	DE-IN-CO
DANar-	12	2	4	1	8	1
DACalcs-	6	2	2	1	4	1
Specs-*(1)	12	2	4	1	8	1
Dwg-1/2-	12	2	4	1	8	1
MMin-*(2)	12	2	4	1	8	1
EMDwg-	1*(3)	-	-	-	-	-
DCLet-	12	2	4	1	8	1
ColBd-	1	-	-	-	2	-
EP Plan	1	-	1	1	-	-
Rend-*(4)	1	-	-	1	1	-

*60 PERCENT SUBMITTAL NOTES:

Specific submittal requirements are identified in Sections 01332 and 01336

*(1) Copy shall show deletions and insertions (Revisions On) for all UFGS and designated CEGS specifications submitted. Process and Print Options for each section furnished shall include the following minimum requirements: Under "Sections" Print/Process Sections and Renumber Paragraphs boxes are checked; Under "Reports" a Section Table of Contents (Include Without Scope and Combine sections and section tables of contents); Under "Options" Section Dates shown, Units of Measure as english, Tags are Hidden, Notes are hidden, Revisions are shown, Start Page Numbering with "1", and Restart for each section box is checked; and Under "Header/Footer" jobtitle and jobname as a Header and Section number and Page number as a footer (similar to format shown on this section of the RFP).
*(2) To be submitted after Review Conference per requirements of this section.
*(3) Electronic Media Drawings:

Fifteen (15) percent of all drawings (exludes Cover Sheet, Vicinity Map, Location Plan and Indexes), representative of all design disciplines, shall be submitted in Microstation J) on CD-ROM to verify that the CADD standards being specified are complied with.

*(4) Pencil or Computer Sketch Rendering (3 views).

3.7.1.4 100 Percent Design Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

Activity Submittal Item	PM-M	CD-Q	CD-RM	CD-RM-FC	DPW-BW	DE-IN-CO
DANar-	12	2	4	1	8	1
DACalcs-	6	2	2	1	8	1
Specs-*(1)	12	2	4	1	8	1
SpecER-	1	1	-	-	-	-
SubReg-	2	2	2	-	-	-
Dwg-1/2-	12	2	4	1	8	1
MMin-*(2)	12	2	4	1	8	1
EMDwg-*(3)	1	-	-	-	-	-
DCLet-	12	2	4	1	8	1
Colbd-*(4)	1	-	-	1	2	-
EP Plan	1	-	1	-	1	-
Rend-*(5)	1	-	-	-	1	-
ECI-	12	2	4	1	8	1

*100 PERCENT SUBMITTAL NOTES:

Specific Submittal requirements are addressed in Section 01332 and 01338.

*(1) Copy shall show deletions and insertions (Revisions On) for all UFGS and designated CEGS specifications submitted. Process and Print Options for each section furnished shall include the following minimum requirements: Under "Sections" Reconcile References, Print/Process Sections and Renumber Paragraphs boxes are checked; Under "Reports" a Section Table of Contents (Include Without Scope and Combine sections and section tables of contents), and Reference Verification, Submittal Verification, Reference Verification, Submittal Verification, Bracket Verification, Section Verification and Submittal Register boxes are checked; Under "Options" Section Dates shown, Units of Measure as english, Tags are Hidden, Notes are hidden, Revisions are shown, Start Page Numbering with "1", and Restart for each section box is checked; and Under "Header/Footer" jobtitle and jobname as a Header and Section number and Page number as a footer (similar to format shown on this section of the RFP).
*(2) To be submitted after Review Conference per requirements of this section.
*(3) Electronic Media Drawings:

Fifteen (15) percent of all drawings (exludes Cover Sheet, Vicinity Map, Location Plan and Indexes), representative of all design disciplines, shall be submitted in Microstation J) on CD-ROM to verify that the CADD standards being specified are complied with.

*(4) Color boards shall show actual color samples of all proposed exterior and interior finishes.
*(5) Color Copy of Rendering.

3.7.1.5 100 Percent Corrected Design Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

Activity Submittal Item	PM-M	CD-Q	CD-RM	CD-RM-FC	DPW-BW	DE-IN-CO
DANar-	12	2	4	1	8	1
DACalcs-	6	2	2	1	8	1
Specs-*(1)	12	2	4	1	8	1
SpecER-	1	1	-	-	-	-
SubReg-	2	2	2	1	8	1
Dwg-1/2-	12	2	4	1	8	1
EMDwg-*(2)	1	-	-	-	-	-
DCLet-	12	2	4	1	8	1
Colbd-*(3)	1	-	-	1	2	-
EP Plan	1	-	1	-	1	-
Rend-*(4)	-	-	-	2	3	-
ECI-	12	2	4	1	8	1

*100 PERCENT CORRECTED SUBMITTAL NOTES:

Specific Submittal requirements are addressed in Section 01332 and 01338.

*(1) Copy shall show revisions executed (deletions removed and insertions markings removed) for all specification sections submitted. Process and Print Options for each section furnished shall include the following minimum requirements: Under "Sections" Reconcile References and Addresses, Print/Process Sections and Renumber Paragraphs boxes are checked; Under "Reports" a Section Table of Contents (Include Without Scope and Combine sections and section tables of contents), and Reference Verification, Submittal Verification, Reference Verification, Submittal Verification, Bracket Verification, Section Verification and Submittal Register boxes are checked; Under "Options" Section Dates shown, Units of Measure as english, Tags are Hidden, Notes are hidden, Revisions are hidden, Start Page Numbering with "1", and Restart for each section box is checked; and Under "Header/Footer" jobtitle and jobname as a Header and Section number and Page number as a footer (similar to format shown on this section of the RFP).
*(2) Electronic Media Drawings (Microstation J) on CD-ROM shall be submitted to verify that the CADD standards being specified are complied with. Resubmittal is not required for interior design submittal, if there are no changes required to the previous submittal. If major changes are required, provide a CD-ROM, 100MB ZIP disk or 3.5" floppy of the following drawings:

- interior design furniture footprint
- architectural composite and area floor plans, and reflected ceiling plans
- electrical lighting, thermostat, power and communication drawings

*(3) Color Boards are not required if there are no changes from the previous design submittal and if only minor changes are required, submit applicable coded samples (with tape ready for application) and corrected color legend. If major changes to the color board are required, resubmit the Color boards with actual color samples of all proposed exterior and interior finishes and revised corrected color legend.
*(4) Framed and matted Renderings.

3.7.1.6 Construction Set Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

Activity Submittal Item	PM-M	CD-Q	CD-RM	CD-RM-FC	DPW-BW	DE-IN-CO
DANar-	12	2	6	1	8	1
DACalcs-	6	2	2	1	8	1
Specs-*(1)	12	2	6	1	8	1
SpecER-	1	1	-	-	-	-
SubReg-	2	2	2	-	-	-
Dwg-1/2-	12	2	6	1	8	1
Dwg-full-	-	-	1*(2)	-	1*(2)	-
EMDwg-*(3)	4	-	-	-	-	-
EMSpecs-*(3)	4	-	-	-	-	-
EMDA-*(3)	4	-	-	-	-	-
DCLet-	12	2	2	1	8	1
ECI-	12	2*(4)	4*(4)	1	8	1
Colbd-*5	-	-	1	-	2	-
Brvw Cmnts	12	2	4	1	8	1

*CONSTRUCTION SET SUBMITTAL NOTES:

Specific Submittal requirements are addressed in Section 01332 and 01338.

*(1) Copy shall shall be the same as the 100 pecent Corrected submittal and incorporate any additional comments made to 100 percent corrected design submittal.
*(2) Each drawing sheet shall be stamped (P.E.) by the appropriate Designer.
*(3) Electronic Media Drawings (Microstation J), Electronic Media Specifications (Specsintact), and Electronic Media Design Analysis (and Adobe Acrobat 5.0. The Design Analysis Calculations shall be included with the design analysis narrative and shall be scanned and saved in Adobe Acrobat 5.0. The design analysis and calculations shall utilize bookmarks for each chapter of the design analysis and each appendix or calculations. Electronic Media shall be on CD-ROM (Recordable compact disk with minimum 650 megabyte capacity)
*(4) In addition, the Contractor shall e-mail the designated offices a copy of the ECI per requirements stated in this section.
*(5) Reflects all changes made through accepted 100 Percent Corrected Design.

3.7.1.7 As-Built Submittals

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

Activity	PM-M	CD-Q	CD-RM	CD-RM-FC	DPW-BW	DE-IN-CO
Submittal Item						
Asblt-	*	-	-	-	-	-
DD1354-	1	1	1	1	1	-

*NOTES for As-Built Submittals:

*See Section 01040, AS-BUILT DRAWINGS for requirements.

3.7.1.8 Design Submittal Alternative

The design-build Contractor may submit an electronic copy of the design analysis, design analysis calculations and appendices, specifications, specification error reports, submittal register, design certification letter with deviations, and engineering considerations and instructions on CD-ROM in an Adobe Acrobat 5.0 .pdf format and maximum of 1 hard copy per office per submittal listed above (CD's are substituted for hard copy numbers). If this alternative is selected, each of these documents shall utilize bookmarks with titles, which ease the review of the design. Each design submittal item and submittal item components shall be made easy to find (i.e. each specification section, chapters and appendices of design analysis, and each submittal item). This alternative will only be allowed if the design-build Contractor presents a legible and easy to review design. Failure to meet this requirement on one design submittal will result in requiring all future submittals and resubmittals to be hard copy as required above, at no additional cost to the Government.

3.7.2 Review Comments:

For each design review submittal, the Contractor will be furnished comments from Omaha District and other agencies involved in the review process approximately 21 days after receipt, unless indicated otherwise. Review conference for the 60 Percent and 100 Percent Design submittals will be held approximately 30 days after receipt. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he/she shall clearly outline, with justification reasons for noncompliance at the design review conference in order that the comments can be resolved. Annotated comments, including the disposition of all comments shall be furnished in writing by the Contractor within five (5) days of the review conference and shall be recorded in the Contractor prepared Meeting Minutes described in paragraph 3.7.6.1. The written documentation shall be forwarded in the same quantities to the distribution list shown in paragraph: "Distribution of Design Documents for Conformance Review" above.

The Government will review the 100% Backcheck Review Documents for a period of fourteen (14) days after receipt of the documents. After this review, a formal letter will be sent to the Contractor allowing him to commence construction or rejecting the submittal.

Any backcheck review comments made by the indicated Government agencies to the 100 percenct Corrected Design Submittals shall be resolved prior to distribution of Construction Set documents. The Contractor shall furnish

copies of Annotated backcheck review comments indicating disposition of all comments with the Construction document set.

3.7.3 Using Automated Review Management System:

Conference and post conference action: Government personnel, from the above Government Agencies, will present review comments for discussion and resolution. Copies of comments, annotated with comment action agreed on, will be made available to all parties before the conference adjourns. Unresolved problems will be resolved by immediate follow-on action at the end of conferences. Valid comments will be incorporated. After receipt of final corrected design documents upon incorporation of all backcheck comments (as many backchecks as are deemed necessary by the Government will be conducted), the Omaha District will recommend acceptance to proceed with construction. The Government intends to utilize the Dr. Checks review system, which is available at: http://65.204.17.188/projnet/home/version1/index.cfm, for processing review comments and responses. Access rights will be provided to the Design-Build Contractor after contract award. The Government, however, reserves the right to not accept design document submittals and withhold design payments, if comments are of too great a significance. In this case, every effort shall be made during follow-up action between the Contractor and the Omaha District to resolve conflicts and problems such that documents can be fully accepted. However, if final submittal(s) are incomplete or deficient, requiring correction by the Contractor and resubmittal for review, the cost of rehandling and reviewing will be deducted from payment due the Contractor at the rate of $1000.00(for each design discipline requiring resubmittal) per submittal. "Design Disciplines" in this paragraph consist of Architectural, Structural, Interior Design, Mechanical, Electrical, Civil/Site work, and Fire Protection.

3.7.4 Delays

Delays caused by the Contractor in completion of the 60 percent design, the 100 percent design or the 100 percent corrected design will not be considered as valid reason to delay completion of the entire design. The Government may not be held liable for delays caused by re-submittal efforts caused by designs submitted, which are rejected by the reviewers.

3.7.5 Reproduction (For Construction):

Upon the Government's completion of the review of the 100% Corrected Design submittal, the Contractor shall reproduce copies of the design documents (accepted for the purposes of beginning construction), subject to the incorporation of the Corrected 100% design review comments. The Cover Sheet of the Contractor prepared drawings shall bear the stamp or seal and signature of the registered architect or appropriate engineer responsible for the work and proposed to meet the RFP requirements. The date on each drawing shall reflect the month and year that the drawings were cleared for the purposes of beginning construction. The Cover Sheet of the drawings, Cover Sheet of the Specifications, and Cover Sheet of the Design Analysis shall include the date that the design documents were cleared for the purposes of beginning construction. The Contractor shall provide corrected 100 percent specifications in both hard copy and electronic media (Specsintact Software Version as noted above or later). Distribution shall be as indicated above. The originals will be retained by the Contractor for recording of as-built conditions. Upon completion of the project, the accepted design documents corrected to reflect as-built conditions shall be supplied to the Government. See Section 01040 AS-BUILT DRAWINGS for

as-built drawing requirements.

3.7.6 Government Design Review and Acceptance

3.7.6.1 Design Review Conference and Post-Design Review Conference Action:

All design review conferences shall be held at Fort Carson. Government personnel will forward review comments to the Contractor for discussion and resolution prior to the design review conference. Copies of comments, annotated with comment action agreed on, will be made available to all parties before the design review conference adjourns. Unresolved problems will be resolved by immediate follow-on action at end of conferences. Valid comments will be incorporated. Upon satisfactory Government review of the 100 percent corrected design documents, the Omaha District will formally provide Government acceptance necessary to initiate construction. The Government, however, reserves the right to not accept design document submittals and to withhold design payments, if comments are of too great a significance. In this case, every effort shall be made during follow-up action between the Contractor and the Omaha District to resolve conflicts and problems such that documents can be fully accepted. However, if final submittal(s) are incomplete or deficient, requiring correction by the Contractor and resubmittal for review, the cost of rehandling and reviewing will be deducted from payment due the Contractor at the rate of $1000.00 (for each design discipline requiring resubmittal) per submittal. The Contractor shall submit to the Contracting Officer within five (5) calendar days, two two (2) copies of meeting minutes summarizing major decision points and issues which requires resolution and the action office. Annotated comments shall be attached to these minutes.

3.7.6.2 Complete Design Documents

The Contractor shall submit complete design documents in the same quantity and to the same offices listed above in paragraph "**Distribution of Design Documents for Conformance Review"**, for each corrected 100 percent design submittal (one or more) until the Government is satisfied that all review comments have been addressed and resolved.

3.7.6.3 Accuracy and Completeness of Design

Reviews by the Government of the design documents shall not be construed to be an endorsement of the accuracy or completeness of the design. Design deficiencies or omissions in the accepted design shall be the responsibility of the Contractor.

3.7.7 DD Form 1354, Transfer and Acceptance of Military Real Property

The Contractor shall provide, for acceptance, a completed DD Form 1354 "Transfer and Acceptance of Military Real Property" (Copy attached at the end of this section) with the 100 percent corrected design documents. DD Form 1354 shall be filled out in accordance with attached Instructions for Preparation of DD Form 1354 and Army Pamphlet 415-28 "Guide to Army Real Property Codes" (Copy dated 02/11/2000 is available at the following website: http://www.usapa.army.mil/usapa_home.asp (Under "Search Publications" for "415-28" or or on solicitation CD-ROM in an Adobe Acrobat .pdf format under UFGS specification folder labeled "GUIDES", file name "p415_28.pdf".) The number of copies of the completed DD Form 1354 is noted above.

3.8 REVISIONS TO THE ACCEPTED DESIGN

(a) The accepted design will be used by all parties involved in construction and in administration of the contract. Therefore, it is imperative that the design documents be kept up to date and an effective system of making and distributing changes be implemented. Since changes to the design increase risk of construction errors and deplete available administrative resources, every effort shall be made to minimize revisions to the accepted design. One of the measures of the Contractor's effectiveness of management will be how well the goal of minimizing changes to the accepted design is met. The use of effective quality control during design, and utilization of experienced and capable designers are some of the means that are expected to be used to accomplish this goal.

(b) If revisions to the accepted design become necessary, the procedures described in Section 01330 SUBMITTAL PROCEDURES will be used to accomplish the revisions. The revisions will be considered a "Variation" and shall be submitted as a "G-AO" submittal. All the requirements in paragraph: "Variations" in Section 01330 SUBMITTAL PROCEDURES will apply to revisions to the accepted design. All design analysis and calculations necessary to establish that the proposed revision satisfies applicable design requirements shall be included in the submittal.

Attachment A

[Contractor's Letterhead]

[Date: _____]
[Contract No. _____]

[Reviewing Component Address]

Subj: DESIGN CERTIFICATION AND TRANSMITTAL FOR
[Project Title _____]
[Project Location _____]
[Contract No. _____]

Gentlemen

Enclosed are the following documents, which I hereby certify are in compliance with the RFP requirements of the subject construction contract and can be used to commence construction subject to Government approval:

1. Design Drawings

2. Project Specification

3. Design Analysis

   a. Civil
   b. Water Supply and Wastewater Collection
   c. Architectural
   d. Interior Design
   e. Structural
   f. Mechanical
   g. Fire Protection
   h. Electrical
   i. Environmental Protection, Compliance and Permits
   j. Health and Safety
   k. Sustainable Design

4. Submittals Register

5. All other Design Deliverables

6. Deviations (List of Deviations with Justification Attached)

[Typed Name and Signature of an
Officer of the Contractor's Company]

Copy to:
[As standard with the Contractor]

-- End of Section --

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TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY

Form Approved
OMB No. 0704-0188

PAGE OF PAGES

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, Va 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. **FROM** *(Installation/Activity/Serviceand Zip code)*	2. OPERATING UNIT	3. DISTRICT CODE	4. OPERATING AGENCY	5. DATE	6. JOB NUMBER	7. SERIAL NUMBER	8. CONTRACT NUMBER

9. **TO** *(Installation/Activity/Serviceand Zip code)*	10. OPERATING UNIT	11. DISTRICT CODE	12. OPERATING AGENCY	13. ACCOUNTING NUMBER	14. ACCOUNTABLE OFFICE NUMBER	15. TYPE OF TRANSACTION		16. PROJECT NUMBER
						A. ☐ NEW CONSTR. ☐ EXISTING FAC. ☐ CAPITAL IMP. ☐ OTHER *(Specify)*	B. ☐ BENF/O ☐ PHYSICAL COM. ☐ FINAN. COM. ☐ OTHER *(Specify)*	

ITEM NO. 17	CATEGORY CODE 18	FACILITY *(Category description)* 19	NO. OF UNITS 20	TYPE 21	UNIT OF MEAS. 22	TOTAL QUANTITY 23	COST 24	DRAWING NUMBERS 25	REMARKS 26

27. STATEMENT OF COMPLETION: The facilities listed hereon are in accordance with maps, drawings, and specifications and change orders approved by the authorized representative of the using agency except for the deficiencies listed on the reverse side.

TRANSFERRED BY *(Signature)*

DATE

TITLE *(Area Engr./Base Engr./DPWO)*

28. ACCEPTED BY *(Signature)*

DATE

TITLE *(Post Engr./Base Civ. Engr./Navy Rep.)*

29. PROPERTY VOUCHER NUMBER

30. CONSTRUCTION DEFICIENCIES

31. REMARKS

INSTRUCTIONS

This form has been designed and issued for use in connection with the transfer of military real property between the military departments and to or from other government agencies. It supersedes ENG Forms 290 and 290B (formerly used by the Army and Air Force) and NAVDOCKS Form 2317 (formerly used by the Navy).

Existing instructions issued by the military departments relative to the preparation of the three superseded forms are applicable to this form to the extent that the various items and columns on the superseded forms have been retained. Additional instructions, as appropriate, will be promulgated by the military departments in connection with any new items appearing hereon.

With the issuance of this DD form, it is not intended that the departments shall revise and reprint manuals and directives simply to show the number of this DD form. Such action can be accomplished through the normal course of revision for other reasons.

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PART 2 NOT USED

PART 3 NOT USED

-- End of Section Table of Contents --

SECTION 01336

60 PERCENT DESIGN REQUIREMENTS

PART 1 60 PERCENT DESIGN SUBMITTALS

Attachments: Code Analysis, ADA Architectural Design Checklist, and Sustainable Project Rating Tool (SPiRiT) Evaluation

For general submittal requirements, See Section 01332 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES.

1.1 SITE PLANNING

1.1.1 Drawings

1.1.1.1 Location Plan and Vicinity Map

The Location Plan and Vicinity Map provided in the Request For Proposal (RFP) shall be updated as necessary and included in the drawings. The Location Plan shall include the Contractor's Access Route, Staging Area, and the Project Site.

1.1.1.2 Removal Plan

The Removal Plan will show the existing physical features and condition of the site prior to any construction or demolition. Each physical feature to be removed shall be hatched as indicated on the standard legend sheet, and properly noted: to be removed, to remain, or to be relocated. A supplemental legend for removals may be required for clarity when numerous removals are required. The Removal Plan shall be prepared at the same drawing scale and use the sheet boundaries as the Site Plan.

1.1.1.3 Site Plan

The Site Plan shall show all the site layout information necessary to field locate the building, parking lots, roads, sidewalks, and all other appurtenances to be constructed as part of the project. All major site work to be constructed will be dimensioned for size and location. The Site Plan will identify all site-related items such as: curbs, pavements, walks, bollards, trash enclosures, retaining walls, chiller units, electrical transformers locations, etc. in accordance with a standard legend sheet or with additional legends or notes. Drawing scales of between 1:250, 1:300, and 1:400 are acceptable scales for the Site Plan. The contractor shall consider the project's construction area, drawing legibility, number of sheets required in choosing the drawing scale. The Site Plan, prior to adding the dimensions and notes, should serve as the base sheet to other Plans, such as: Utilities Plan, Grading and Drainage Plans and Landscape Plan. Existing and proposed contours or utility lines shall not be shown on Site Plan. Physical features that will remain after the proposed construction has been completed shall be shown. This plan, or the Location Plan, will also show any free zones, construction limits, etc. Whenever the Site Plan occupies more than one sheet of drawings, a Key Plan shall be included. Additional plans showing specific areas of the site in smaller scales can be included if more detail is necessary.

1.1.1.4 Site Details

The Contractor shall provide designs and details as necessary for site furnishings, accessories, accessible parkings stalls and ramps, bollards, signage, striping, and any other site structure or item requiring a detail for clarity and construction accuracy.

1.1.1.5 Landscape Plan

A detailed Landscape Plan showing trees, shrubs, ground covers, seeded and sodded areas, shall be prepared by the Contractor. The Landscape Plan shall be prepared by a fully qualified, experienced professional Landscape Architect. The Contractor shall specify types of plant materials that are locally grown, commercially available and acclimated to the project environment. The Landscape Plan shall include a plant materials schedule or listing. This schedule shall include botanical names, common names, key, size and the method of transplanting. The Landscape Plan shall also show all unsurfaced ground areas disturbed by construction within the project limits with these areas shown to be seeded, sodded, or mulched as required.

1.1.1.6 Landscape Details

The Contractor shall verify the methods of planting to meet the project site/installation requirements and provide the necessary Landscape Details to perform the contract design work. Details shall reflect local practices and conditions for installation.

1.1.2 Specifications

Provide a listing by title and number of all Technical Specifications proposed for use in the final site design.

1.1.3 Design Analysis Narrative

Design analysis shall include the following:

1.1.3.1 Design References

Design references used in preparing the site design.

1.1.3.2 Basis, Specific Goals, Objectives and Priorities For Site Design

The Design Analysis should give the basis, specific goals, objectives and priorities for site design of the project. Identify, explain and document use of design criteria and how the design meets goals, objectives and priorities. Identify the preferred site development concept. Document pollution prevention measures and other environmental considerations made during design. The 60 percent Design Analysis must be approved and accepted before Final Design.

1.2 CIVIL

1.2.1 Drawings

1.2.1.1 Grading and Drainage Plan

A preliminary grading and drainage plan showing the proposed layout of all

storm drains and roof drains shall be provided at the same scale as the site plan. Existing grading contours shall be indicated at 1 foot contour intervals. Tentative new grading contours shall be shown. Indicate proposed finished floor elevation of the new building. Provide location and description of benchmarks and indicate vertical and horizontal datums.

1.2.1.2 Typical Pavement Sections

Provide typical pavement and road sections and details showing interface between new and existing pavements and new pavements of different sections.

1.2.2 Specifications

Provide a listing by title and number of all Technical Specifications proposed for use in the final civil design.

1.2.3 Design Analysis Narrative

Design analysis shall include the following:

1.2.3.1 References

Design references used in preparing the civil design.

1.2.3.2 Grading

A narrative of the grading design and criteria used.

1.2.3.3 Pavements

A narrative of the pavement design and criteria used plus design calculations used to obtain the pavement design.

1.2.3.4 Drainage

A narrative of the drainage design and criteria used. Include information on the storm drain and culvert pipe materials anticipated to be used.

1.2.3.5 Basis, Specific Goals, Objectives and Priorities For Civil Design

The Design Analysis should give the basis for the civil design and should establish specific goals, objectives and priorities for civil design of the project. Identify, explain and document use of design criteria and how the design meets goals, objectives and priorities. Identify the preferred site development concept. Document pollution prevention measures and other environmental considerations made during design. The 60 percent Design Analysis must be approved and accepted before Final Design.

1.3 GEOTECHNICAL

See also Structural Design Requirements.
Provide suitable and unsuitable materials lists for grading, backfilling for buildings and structures, and utilities in appropriate specification sections. Indicate over excavation depths, backfill requirements, and compaction criteria beneath foundation members. A geotechnical investigation report and foundation analysis have been provided in Attachment No. 1 of the RFP documents.

1.4 WATER SUPPLY AND WASTEWATER

1.4.1 Drawings

1.4.1.1 Water Distribution and Sewage Collection Systems Plan (including building services)

Provide all existing utilities and above ground features which may pose as an obstacle (i.e., water, sewer, gas, electrical, etc.) on a utility plan layout that is separate from the site plan. Exclude siting notes and dimensions from the plan. Provide all proposed new water and sewer lines with preliminary sizes. This shall include all new service lines up to the 5 foot building line. Show the proposed locations of all new manholes, fire hydrants, valves (including PIV's), and connection points.

1.4.2 Specifications

Specifications shall be coordinated with the plans and include all items. Provide a listing of specifications to be provided. Provide a complete copy of special sections to cover those subjects for which no UFGS guide specifications are used or available.

1.4.3 Design Analysis Narrative

Design analysis shall include the following:

1.4.3.1 References

Provide design references used in preparing the water and wastewater design.

1.4.3.2 Water Supply and Distribution Systems

A narrative of the water supply and distribution systems design and applicable criteria used shall be provided. Include the peak and average domestic demands, the fire flow required and the available flow and residual pressures. A description of the water distribution system, a listing of allowable piping materials, hydrant flow test data and preliminary calculations necessary to support equipment, piping sizes, fire and domestic demands, etc., shall be provided. The calculations for water and fire water line sizing shall be based on hydrant flow test data that is verified by the Corps of Engineers, Omaha District, Design Branch, Environmental Design Section.

1.4.3.3 Wastewater and Sewers

Based on existing information the sanitary sewer system in the vicinity of the proposed facility is assumed to be adequate to carry the flows expected to be generated by the new facility. A narrative of the wastewater supply design and applicable criteria used shall be provided. Include the preliminary calculations used to design the average and peak contributing flows. Field verify the available capacity and full flow capacity of the existing system to ensure that it will be adequate for the flows generated by the new facility. Include the available capacity and full flow capacity in the design analysis. Preliminary calculations necessary to support equipment and piping sizes and a listing of allowable piping materials shall be provided.

1.5 ARCHITECTURAL

1.5.1 Drawings

Sixty percent architectural drawing submittal shall be a complete set of architectural drawings without large scale details. All other drawings shall be complete except referencing of the large scale details.

1.5.1.1 Floor Plans

Provide a double line Floor Plan, drawn at the largest scale practicable to include the entire building on a single sheet. See paragraph on Drawing Scales for plan scale requirements. Floor plans shall essentially be complete with the exception of large scale detail referencing. Floor plans shall be scaled double-line drawings showing the functional arrangement, pocheing, location of all openings and plumbing fixtures, all section cuts, wall types, all notes and leaders, all general notes, and all dimensions shall be completed. The plans shall indicate door swings, door numbers and window type; door and window schedules are required. A north arrow shall be shown on each floor plan. Equipment floor plans shall be provided at the same scale as the area floor plans. Equipment floor plans shall show locations of all equipment required and shall be coordinated with all other disciplines for supporting utilities. Enlarged toilet plans shall also be included. The first composite plan sheet shall include a gross area tabulation comparing the actual square footage with the authorized square footage of the facility. Architect-Engineer suggestions for plan improvement shall be fully shown and justified. Include the following:

Overall, control, and door/ window opening dimensioning.
Match lines for combining individual portions of floor plans.
Room names and numbers.
Structural column or bay indicators.
Wall and building section cuts.
Door swings and door numbers.
Window types.
Area in square feet.
General notes.
All Floor & Wall Patterns/Borders.

When dimensioning, use arrowheads, not dots or slashes. Where major structural elements are included as parts of architectural detailing, do not indicate sizes. These elements should all be fully defined as part of the structural design documents. Major elements of mechanical and electrical equipment affecting room size or shape, shall be shown on the architectural plans to a practicable extent and coordinated with other respective disciplines. When applicable, Government-furnished, Contractor-installed (GFCI), or Government-furnished and Government-installed (GFGI) items shall be shown as a dashed line.

1.5.1.2 Reflected Ceiling Plans

Reflected ceiling plans shall be complete including all electrical lights, mechanical supply & diffusers, notes, complete legends and pocheing of all materials to be used. See paragraph on Drawing Scales for reflected ceiling plan scale requirements.

1.5.1.3 Roof Plan

Roof plans shall be complete including all notes, legends, slope indications, gutter and downspout locations, and roof overflow drains. All elements located on the roof shall be coordinated with all disciplines. See paragraph on Drawing Scales for roof plan scale requirements. Roof mounted

equipment should be limited to exhaust fans, vents, and intakes, no large pieces of equipment shall be allowed to be mounted on the roof.

1.5.1.4 Building Elevations

Provide all building elevations complete showing the appearance and architectural treatment. Elevations shall be dimensioned to show total height, and relation to grade. Critical elevations such as top of finish floor, top of steel, etc. shall be indicated. All notes for materials shall be included. See paragraph on Drawing Scales for Exterior Building Elevation scale requirements.

1.5.1.5 Building Sections

Building cross section and longitudinal sections shall be included to show general interior volumes, construction methods, and height of ceilings and partitions. Identify materials used and necessary dimensions. See paragraph on Drawing Scales for Building Section scale requirements.

1.5.1.6 Wall Sections

Drawings shall include all wall sections conditions including corridors, showing vertical control elevations and dimensions, with all materials labeled. The sections should normally be cut through doors, windows, and other critical wall section locations. Wall sections shall not be broken. Additional details shall be included when necessary to illustrate important or unusual features. All horizontal dimensions shall occur on the plans and vertical dimensions on the sections and elevations. See paragraph on Drawing Scales for Wall Section scale requirements.

1.5.1.7 Room Finish Schedules

Room finish schedule shall be complete in accordance with Corps of Engineers (COE) standard format.

1.5.1.8 Furniture Placement Plan

Provide a layout showing all desk, Lockers, and furniture that will be incorporated into the design of this project.

1.5.1.9 Door, Window, and Louver Schedules

Door schedule shall be complete in accordance with Corps of Engineers (COE) standard format. Schedule shall include door and frame types, except referencing to door details and hardware sets. Window and louver schedules shall be complete including window and louver types except referencing to details.

1.5.1.10 Fire Ratings

Wall ratings, and fire hazards shall be clearly indicated as required by Fire Protection criteria. Wall fire ratings shall be graphically shown by a continuous symbol or pocheing within the wall on a Fire Protection /Life Safety Plan. When other functions coexist with the fire protection functions, their integration shall be clearly indicated, with an analysis that describes how both functions will be served. Provide a separate, floor plan which makes an accurate presentation of these various features and functions.

1.5.1.11 Drawing Scales

Architectural work shall be drawn at the scales listed below. Other scales may be used only by written authorization through the Technical Manager, Omaha District. Units of measurements shown on the drawings shall be done in feet and inches. All disciplines should use the same scale for plan sheets. The following is a comparison guide to establish equivalent scaling of drawings:

	ENGLISH
Composite Plans (Note 1)	Varies
Floor Plans	1/4' = 1'-0"
Reflected Ceiling Plans	1/8" = 1'-0"
Detail Plans (Note 2)	1/2" = 1'-0"
Roof Plans	1/8" = 1'-0"
Exterior Elevations	Same scale as floor plan
Interior Elevations	1/4" = 1'-0" min.
Interior Toilet Elevations	1/2" = 1'-0"
Building Cross Sections	1/8" or 1/4" = 1'-0"
Wall Sections (Note 3)	13/4" = 1'-0"
Details (Note 2)	3" = 1'-0"
Wall Types	1-1/2" = 1'-0"
Fire Protection Plans (Note 1)	Varies

Notes:

1. Scale of composite plan shall be as required so that the entire facility is drawn on one sheet without break lines.

2. The goal of this requirement is that the details be large enough to show all fixtures, accessories, equipment, materials, manner of construction, clearances required for proper maintenance, and complete dimensions. Toilet rooms and Equipment rooms are examples of the kind of spaces which shall be drawn as a Detail Plan.

1.5.1.12 Legends

Standard architectural material symbols used on the drawings shall be provided as a separate architectural legend drawing located just in front of the architectural drawings in the set. Additional material symbols should be added to the Legend Sheet as needed for the project.

1.5.1.13 North Arrows

North arrows shall be oriented the same direction on all plan sheets and by all disciplines; including site and civil drawings. Plan north shall be "up" or to the "left" on the drawings. Indicate true north on composite plan drawings. North arrows shall be located approximately at the same location on all sheets.

1.5.1.14 Modular Design

Modular Design practices shall be followed in the design of all masonry buildings or components of buildings. Dimensions shall be figured to whole or half-unit lengths of standard units in order to reduce on-site cutting of masonry.

1.5.1.15 Symbols

The Room and Door Numbering system shall be consistent. The standard symbols for Amendments (a triangular box) or Modifications (a type of circular box, see the chapter on Drafting Criteria) to the contract shall not be used for any other purpose, and care must be taken to avoid using even similar appearing but technically different symbols. Room numbering shall start at the main entrance and proceed clockwise around functional areas.

1.5.1.16 Schedules

Schedules for room finish, doors, windows, louvers, etc., shall be clear and complete. As many columns as necessary should be provided in order to present the essential information. The "Remarks" column should not be used as a substitute for an information column. Normally a single item should be presented on each schedule line. Other scheduling methods as standard with the A-E may be used if approved by written authorization from the Project Architect, Omaha District.

1.5.1.17 Notes

Notes may be placed on drawings to reduce the amount of repetitive drafting, provided that clarity is not lost. General notes should be placed at the right-hand edge of the sheet and, if possible, should be located on the first sheet in the set. Notes that pertain to each drawing however, should be placed on each drawing.

1.5.1.18 Dimensions

Dimensions must be complete, accurate and fully coordinated. Dimensions should be to points easily measurable in the construction, and should be laid out to eliminate refiguring in the field. Dimensions should be tied-in to column lines, etc., to facilitate checking. Plan dimensions for frame construction should be to face of stud (or sheathing) for exterior walls, to one face of stud for interior partitions, and to centerline of openings. For masonry construction, dimensions should be to one or both nominal faces of masonry and to jambs of openings.

1.5.1.19 Facility Elevation

The level of finished first floor shall be indicated as EL.= 100'-0". Elevations for footings, etc., shall be related to this figure. Sea level elevations shall not be shown on the building drawings.

1.5.1.20 Access to Utilities

All utilities within the building, such as piping, ductwork, electrical work, etc., shall be concealed in finished areas. Provide plumbing chases in toilet areas. The clear space above ceilings and the size of chases must be carefully figured to accommodate piping slopes and connections, ductwork crossovers, and similar situations. Access must be provided to valves, cleanouts, etc. Space provided for utilities systems must be adequate but should not be excessive.

1.5.1.21 Reflected Ceiling Plans

Reflected Ceiling Plans shall be provided for all spaces in the building. Reflected ceiling plans shall show the ceiling tile layout and location of

gypsum wallboard and other ceiling types where applicable. All light fixtures, air diffusers, grilles, registers, PA speakers, sprinkler head layout, smoke and heat detectors - if ceiling mounted, and other ceiling mounted items will also be shown on the reflected ceiling plans. The fixtures and other equipment shall be laid out in a regular pattern symmetrical with the ceiling tile grid, or symmetrical with the room centerlines, columns, windows, or other feature that dominates. All ceiling mounted items shown shall be fully coordinated with all other disciplines.

1.5.1.22 Sketches

All sketches presented during the design phase shall be reduced to 8-1/2" by 11" and included in this design analysis to document the design options and decisions evaluated during the design process.

1.5.1.23 Rendering Sketches

At this phase, the Contractor shall submit three (3) sketches or three (3) computer generated birds-eye views of the Fire Station. The views shall be taken at an angle from the west, northwest and southwest looking generally toward the east, and shall include the front entrance. The views shall depict walks, parking, vehicles, landscaping, fencing, out-buildings and other surrounding features. One view will be chosen at this phase for finalizing as a color rendering. See Section 01338 100 PERCENT DESIGN REQUIREMENTS.

1.5.2 Technical Specifications

1.5.2.1 Use of Technical Guide Specifications

Unedited Technical Guide Specifications (Unedited UFGS - Unified Facilities Guide Specifications sections available as indicated in Section 01332 Submittals During Design)shall be prepared for the Contractor to edit in order to achieve the maximum uniformity in contract specifications. The technical guide specifications describe the type and quality of material and installation normally acceptable for Corps construction, and often represent specific agreement between the Corps and the applicable industry. The provisions of the technical guide specifications should not be changed without justification. The 60% submittal shall include draft edited specifications of all the applicable sections. Items added or deleted in these specification sections shall be evident. Complete descriptions including specific size, gauge, and configuration are included in the technical Guide Specifications for a wide variety of items. The designer must be familiar with the technical Guide Specification requirements in order to provide details fully coordinated with the technical specification descriptions. Terminology used on the drawings shall be the same as used in the Technical Guide Specifications. Where it is desirable to detail a variance with the standard provisions of the Technical Guide Specifications, the specifications must be revised to coordinate with the details. In addition to the guidance in SECTION 01332 on editing technical specifications, data and sample submittals for all interior and exterior finishes shall be "GA 1" submittals.

a. New Guide Specifications

New guide specifications shall be limited to those specialty type items not covered in the regular sections of UFGS Technical Guide Specifications.

1.5.3 Design Analysis Narrative

The Design Analysis shall be essentially complete with emphasis on the following:

1.5.3.1 Basic Criteria Statement

A statement indicating the basic criteria to be applied to the design including type of construction (noncombustible, etc.), category of construction (permanent, etc.), major fire protection and exit requirements, etc..

1.5.3.2 Description of Materials

A description of materials for all major building components and of all interior and exterior finishes ascertaining their matching of existing. The description of materials must include type of exterior wall construction, room finish schedule, window types, panel materials, etc. The description of materials should follow the continuity of the Military Handbook 1190. The description of finishes may be presented in schedule form.

1.5.3.3 Additional Criteria/Clarification

A list of items on which additional criteria, clarification, or guidance is required.

1.5.3.4 Reason for Selection

The written presentation must include the designer's reasons for selecting specific materials, architectural compatibility, and architectural treatment in all cases in which the reason for selection is not obvious.

1.5.3.5 General Parameters

The design analysis shall follow the format described herein.

a. The purposes, overall functions, and total capacities of the facility.

b. The design theme or visual appearance of the exterior and interiors of the building, and how this facility coordinates with the image criteria of the installation on which it will be constructed.

c. The number of personnel to use facility.

d. The type of activities and equipment involved.

e. The anticipated life of the functions to be accommodated.

f. The category of construction; permanent

1.5.3.6 Functional and Technical Requirements

a. Functional areas, occupant capacities, and allocation, including a functional relationship matrix.

b. All items of equipment, required.

c. Occupational safety and health.

e. Energy conservation energy budget goals.

f. Sound and vibration control.

g. Interior service areas.

h. Physical security; lock and keying, intrusion-detection, alarms, restricted access areas, interior guard support, and ties to local authorities.

i. Justification for selection of exterior and interior finishes and materials.

j. Moisture Vapor Control.

k. Lessons learned incorporated into the design.

1.5.3.7 Design Objectives and Provisions

a. Adaptation of the building to the size, shape, and orientation of the site.

b. Building layout to establish convenient circulation flows during normal operation and emergency evacuation activities, for materials, equipment, services, and people.

c. Grouping spaces into sound-compatible zones and protective construction zones, e.g., for fire and storm.

d. Space layout compatible with modular (structural and environmental) support systems.

e. Type of construction materials, architectural systems, and finishes.

f. Building expandability/changeability.

g. Physical security.

i. Energy conservation. (insulation, orientation)

j. Acoustical design.

k. Moisture vapor condensation design.

l. Composition of masses and spaces architectural compatibility and architectural details to reflect the design theme and desired image, and the scale and nature of the activities involved.

m. Perception of the building details and volumes. (Specific provisions made, e.g., an identifiable sequence of viewing positions for experiencing the interior and exterior architectural design.)

n. Enhancement of materials and systems maintenance and operation.

o. Economy of building construction, operation, and maintenance: life-cycle cost effectiveness.

1.5.3.8 Coordination with Installation or Outside Agencies

a. Physical security support.

b. Occupational safety and health, as required.

c. Government furnished equipment.

d. Operations and maintenance support.

1.5.3.9 Checklists and Evaluations

Fire Protection Code Analysis, Handicapped Accessibility requirements, and SPiRiT documentation shall be included in the Design Analysis. See attachments (Code Analysis, ADA Architectural Design Checklist, and Sustainable Project Rating Tool (SPiRiT) Evaluation) at the end of this section.

1.5.4 Design Analysis Calculations

a. Net room areas, occupant capacity and gross building areas.

(Categorize areas and capacities under the titles of "Operational Space Requirements", "Administrative Space Requirements", "Storage Space Requirements", and "Support Space Requirements".)

b. U-values for each wall, window, door, or roof type studied or selected.

c. Acoustics.

d. Rainfall intensity relative to roof area and roof drain size and number calculations.

1.6 INTERIORS

1.6.1 DESIGN ANALYSIS/NARRATIVE

The design analysis shall contain an explanation of the desired image or visual appearance of the interior of the facility and the design intent.

1.6.2 TECHNICAL SPECIFICATIONS

Appropriate UFGS guide specifications shall be provided and coordinated with the drawings and design analysis. Specifications shall be edited to identify proposed product and installation requirements. Use SECTION 09915 Color Schedule to specify exterior and interior finish colors. Where materials or installation requirements are not covered in the provided specifications, information shall be prepared to cover these items. In addition to guidance provided in SECTION 01332 on editing technical specifications, data and sample submittals for all interior and exterior finishes (including but not limited to interior design and architectural specifications) shall be "G-AE" submittals.

1.6.3 COLOR BOARDS AND LEGENDS

Color boards shall show actual color samples of all proposed exterior and

interior finishes. A color board legend shall accompany the boards and shall clearly identify all finishes. Clarification of finish placement shall be required when more than one color of a single finish is proposed. Color boards shall be 8 1/2" x 11" in size and provided in a three ring binder. Include project name and location, design stage and date on the front cover and spine of the binder.

1.6.4 FURNITURE Layout

A furniture footprint shall be provided to include all furniture and equipment in the project.

1.7 STRUCTURAL

1.7.1 DRAWINGS

Drawings shall include roof framing plans, floor slab plans and foundation plans for buildings. Roof framing plans shall show sufficient details to clearly indicate the type of framing system used, size and spacing of members and their elevations. The location of all columns or pilasters shall be shown, and all building structural members shall be at least outlined. The sizes, locations and elevations of footings shall be shown. Slab plans shall be coordinated with the Architectural sheets, and shall indicate the locations of structural walls and masonry partitions, recessed slabs and contraction or construction joints. Concrete slab-on-grade thicknesses and sections shall be shown. Proposed treatment of unique or complex features and details shall be shown on the drawings. Elevation views, sections and details necessary to illustrate the design at a 60% level of completion shall be provided. Drawings shall also include overall building plan dimensions, north arrows, and design notes. Drawings shall be done at a scale appropriate for the design, in no case however, shall plan type drawings be done at a scale smaller than 1/4 inch = 1 foot or detail type drawings at a scale smaller than 3/4 inch = 1 foot.

1.7.2 SPECIFICATIONS

For this 60% design submittal the Contractor shall provide a listing by title and number of all Technical Specifications proposed for use in the final structural design.

1.7.3 DESIGN ANALYSIS NARRATIVE

Design analysis shall follow the format described in Section 01332 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES, Paragraph 3.3, "Design Analyses" and the specific content shall be essentially as outlined below.

1.7.3.1 Design Criteria and References

A list of design criteria references, such as Department of the Army Manuals, Army Corps of Engineers Technical Instructions, ACI Standards, AISC Specifications, etc., and any other references which were used in the design of the project shall be included in the narrative.

1.7.3.2 Design Loads and Conditions

A list of structural design loads and conditions shall be provided, including:

- Snow load parameters;
- Wind load parameters;
- Seismic design parameters;
- Roof live loads;
- Floor live loads, identifying each loading with usage and the room or space where used;
- Foundation design criteria, including the design depth for footings, allowable soil bearing pressure, equivalent fluid densities (or lateral earth pressure coefficients) for the design of earth retaining structures and building components, modulus of subgrade reaction, and any other pertinent data derived from the recommendations of the Contractors Final Foundation Analysis report.

1.7.3.3 Structural Materials

A list of structural materials shall be provided, together with the stress grades and/or ASTM designations, as applicable, for structural steel, concrete, and reinforcing steel; the series for steel joists; and identification of the proposed use of each material in the structure.

1.7.3.4 Availability of Precast Concrete Units

Where precast concrete units of particular cross section(s) and concrete strength are a part of the structural design, verification of their availability from precast producers in the project vicinity shall be documented. Acceptable documentation consists of letters from the producers or a written statement by the Contractor identifying the name and address of the precaster(s), description of units and concrete strength(s) available, date when availability was verified, and name of Contractor's staff member who obtained the verification.

1.7.3.5 Description of the Structural System

A concise description of the proposed structural systems selected for the building, together with the reasons for its selection, shall be provided. All principal elements of the structural system selected shall be described. Typically, these shall include:

- Primary supporting members for the roof;
    - Masonry walls, type of material, and whether load bearing or non-load bearing, with location of load-bearing walls defined, and measures taken to compensate for expansion/contraction and crack control in masonry walls;
    - The proposed system for resisting lateral forces (wind and earthquake) and transferring them to the ground, whether diaphragms, chord bracing, shear walls, braced or moment resisting frame, etc;
    - Foundations, description of special designs to accommodate existing site conditions;
    - Concrete slab-on-grade floors, description of floor surface finish treatment, accommodation of live loads, and the use, location and types of crack control joints;
    - The proposed treatment of any unusual structural loadings, features or unique solutions to structural problems.
    - Identification of any major vibrating elements and measures taken to isolate them.

1.7.4 DESIGN ANALYSIS CALCULATIONS

The extent of the structural calculations shall be indicative of a design which has reached a 60% level of completion. Computations shall include the determination of snow, wind, seismic, dead and live loads. Computations shall show sizing and spacing of structural members for roof framing, sidewalls and foundation sizes, as appropriate to the systems to be used for these elements.

1.8 MECHANICAL

Compliance with the design requirements for the building mechanical systems will be determined by a review of the submitted 60 percent drawings, design analysis, and specifications. Any conflicts in the design requirements or lack of thorough understanding of the nature and scope of work shall be identified and resolved prior to submittal of the 60 percent design.

1.8.1 DESIGN DRAWINGS

The 60 percent design drawings shall be fully coordinated with the design analysis. Provide sufficient plans, piping diagrams, sections,air & water flow diagrams, details, schedules, and control diagrams/sequences of operation etc. shall be provided as necessary to define the required design intent. Floor plans shall use the architectural floor plans as a basis, with the building outline half-toned. Unless otherwise indicated, all floor plans shall be drawn at 1/8 inch + foot scale and show all room names and numbers. Coordinate with architecture design for provisions of access panels for all concealed valves, traps, fire dampers and air vents etc.. Coordinate with architectural design so that louvers shown on architectural drawings match damper sizes for the respective openings as shown on Mechanical drawings. An exception to this are administrative areas being air-conditioned shall be 1/4 inch = foot scale and enlarged mechanical room plans shall be 1/2 inch = foot scale. Sheet reference number sequencing shall be in accordance with the Omaha District CADD Standards Manual. Submittal drawings shall include, but not limited to, the following:

1.8.1.1 Mechanical Index Sheet

An index sheet identifying all mechanical drawings shall be provided, including those drawings anticipated to be provided in the 100 percent design submittal. Index shall include drawing design file numbers, drawing numbers, sheet numbers, and drawing descriptions.

1.8.1.2 Mechanical Abbreviation, Legend, and General Notes Sheet

This sheet shall include all mechanical abbreviations and symbols that will be used on the drawings. Symbols shall be grouped into sections; as a minimum, provide sections for Plumbing, Heating, Miscellaneous Piping, Valves and Fittings, and ventilation.

1.8.1.3 Exterior Utility Drawings

The following exterior utility drawings shall be provided:

a. Removal Plan

All existing exterior mechanical utilities and utilities which are to be removed shall be indicated on the Site Removal Plan located in the civil section of the drawing package.

b. Utility Plan:

All existing and new mechanical utilities shall be indicated on the Site Composite Utilities Plan located in the civil section of the drawing package. The location of existing exterior utilities shall be thoroughly checked and indicated on plans and profiles, thus preventing interference with new services. The utility drawing shall indicate all new utilities, including tie-in points, and existing utilities which are to be abandoned.

1.8.1.4 Plumbing Drawings

The following plumbing drawings shall be provided:

a. Plumbing Plans

Plumbing plans showing the design and tentative layout of the domestic hot and cold water distribution systems; make-up water piping; soil, waste and vent piping; and storm water drainage system shall be provided. Plans shall show all anticipated routing of piping systems from the connections within the structure to a point 5 feet outside the structure. The grade of all drain lines shall be calculated and invert elevations established. All electrical panels/equipment and pertinent HVAC equipment (expansion tanks, boilers, AHU's, pumps, lawn sprinkler system, etc.) shall be outlined in half-tone on the plumbing plans. Plans may combine building areas and be drawn at 1:100 scale as long as legibility is not compromised. Plumbing fixtures and drains shown on the drawings shall be designated by the same identification system used in the Technical Specification and Plumbing Fixture Schedule.

b. Enlarged Mechanical Room Plumbing Plan

An enlarged mechanical room plumbing plan drawn at a minimum 1/2-inch = 1 foot scale shall be provided. Plan shall show layout of all plumbing equipment and piping within the rooms. In addition to all the plumbing systems required, the plan shall show half-toned outlines of all HVAC equipment located in the room, gas service, lawn sprinkler apparatus, the fire protection entrance and risers, and the outline of any electrical panels or equipment located in the room.

c. Plumbing Detail and Schedule Sheet

The following details shall be provided: water heaters, and water service entrance. The provided plumbing fixture schedule and a contractor generated water heater schedule shall be provided.

d. Enlarged Toilet Room Plans

Enlarged toilet room plans showing all fixtures, water, waste, and vent piping shall be provided for each toilet area. Enlarged plans shall be drawn at a minimum 1:20 scale.

1.8.1.5 Mechanical HVAC Drawings

Show on mechanical HVAC drawings, all items of mechanical equipment, including boiler room equipment, HVAC equipment layout, air handling units, air distribution and exhaust systems, etc., to determine proper space allocation within the intent of the architectural layout requirements. Plans, elevations, and sections shall be developed sufficiently to insure

that major equipment items, piping, and ductwork cause no interference with structural members, electrical equipment, etc. The following HVAC drawings shall be provided:

a. Mechanical HVAC Plans

Mechanical HVAC plans showing the design and tentative layout of the hot water piping distribution system and equipment, the air supply and distribution systems, and the ventilation and exhaust systems shall be provided. Air supply and distribution systems shall show all ductwork, including supply and return ductwork, ductwork to diffusers, and all diffusers. For the 60 percent submittal, all ductwork may be shown as single-lined. The final design submittal shall show all ductwork as double-lined. All electrical panels/equipment and pertinent plumbing equipment shall be outlined in half-tone on the HVAC plans.

b. Enlarged Mechanical Room HVAC Plans

Enlarged mechanical room HVAC plans showing all mechanical systems and drawn at a minimum 1/2-inch = 1foot scale shall be provided. Plans shall show layout of all equipment, AHU'S pping, and ducts located within the rooms. Equipment shall include (but not limited to) air handling units with associated outside air intakes, relief air, and supply/return ducts; exhaust/supply fans, mechanical room ventilation intake/relief openings, gas service entrance, combustion air opening, unit heaters, HW pumps, CW pumps, boilers, chillers, condensing units, air separators, expansion tanks, water treatment, variable frequency drives and temperature control panels. Openings for relief air and outside air shall be coordinated with size of architectural louver. Plans shall show dedicated access space for items requiring maintenance to include tube pull space for boilers and heat exchangers. In addition to all the mechanical HVAC systems required, the plan shall show half-toned outlines of all major plumbing equipment, the water service entrance, fire protection entrance and riser, lawn sprinkler apparatus, and any electrical equipment or panels located in the room.

c. Mechanical Room Sections:

For each air handling unit within the mechanical room, a mechanical room section view shall be provided showing, but not limited to, all AHU components, ductwork connections/routing, and relationship to adjacent structural features.

d. Hot Water & Chilled Water System Flow Diagram:

Provide flow diagram showing the facility piping system including the pumps and connected hot water & chilled water equipment. Each pump and equipment item shall show associated flow rate. All thermometers, pressure gauges, isolation and control valves, bypass piping, freeze protection piping, etc. shall be shown on the flow diagram. Coordinate heating and chilled water flow with control valves so that adequate three-way valves are provided to insure minimum floor rates through boiler and chiller at low building load demands.

e. Mechanical Detail Sheets:

Installation details showing all specification requirements such as isolation and balancing valves, thermometers, pressure gauges, equipment pads, strainers, vents, hangers, vibration isolation, etc. shall be provided for each item of mechanical equipment. As a minimum, the

following mechanical details shall be provided to the extent they are included in the design:

Refrigerant Piping Diagrams
Hot Water Boilers and Piping Diagrams
Chilled water piping Diagrams
Chilled water pumps
Hot Water Pumps
Hot water coil piping

Chilled water coil piping
Expansion Tanks
Horizontal Unit Heaters
Vertical Unit Heaters
Chemical Shot Feeders
Gas Service Entrances
Cabinet Unit Heaters
Air Handling Units
Wall Propeller Supply/Exhaust Fans
In-line Supply/Exhaust Fans
Relief Hoods
Relief Vents
Exhaust Hoods

Infra-red Systems

Humidifiers

f. Mechanical Schedule Sheets

Schedules, with preliminary capacities, shall be provided for each item of mechanical equipment. Furnished typical equipment schedules shall be used whenever possible and shall be revised and completed as necessary to suit the project requirements. In addition to the furnished schedules, damper and control valve schedules shall also be provided.

1.8.1.6 HVAC Control Drawings

Simplified, one-line type control schematics showing all control system interface points and detailed sequence of operation shall be provided for all mechanical equipment and systems. Sequence of operation for each item of equipment and system shall be sub-sectioned into paragraphs describing discreet operational requirements. See section 1006 for specific DDC control system requirements. The following drawings shall be provided:

HVAC Controls Legend:

This sheet shall include all control abbreviations and symbols that will be used on the drawings. Furnished Controls Legend sheet shall be used as a basis for all abbreviations and symbols used on the Final Control Drawings.

a. Misc Systems

These sheets shall include all miscellaneous equipment items such as supply/exhaust fans, unit heaters, infra-red heaters, controls, air compressors, etc. that are not interlocked to the main HW, CW or air handling unit systems. Provide control schematic and sequence of control for each item of equipment on the same sheet.

b. Hot Water System

Provide a boiler and pumping system control schematic and sequence of operation.

c. Not Used

d. Air Conditioning System:

Provide a condensing unit, evaporator and chilled water pumping system control schematic and sequence of operation. Include all items of equipment that are interlocked to each system.

e. Air Handling Systems

For each air handling system, including outside air makeup system, provide a control schematic and a sequence of operation. Include all items of equipment that are interlocked to each system.

f. Control Points Lists

Provide Local Control Panel control points lists for all items of equipment and systems, identifying all anticipated temperature control system input/output points. The format for defining the input/output points shall be as identified on the furnished Example Control Point List sheets.

1.8.2 TECHNICAL SPECIFICATIONS

Government provided (UFGS) technical guide specifications (available to the Design-Build Contractor shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product and installation requirements for the facility. The provided specifications define the minimum requirements for items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals and testing that shall be provided for the facility. Where items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals or testing requirements are not covered in the provided specifications, special Sections within each guide specification(s) shall be prepared to cover those subjects. Specific items of equipment identified in the provided specifications but not required for the facility shall be edited out. Government approval is required for any specification addition or deletion.

The following UFGS guide specifications shall be edited and coordinated with the drawings and design analysis to identify the proposed product and installation requirements for the facility:

02556 Gas Distribution System
11400 Food Service Equipment
13202 Aboveground Fuel Tanks
13080 Seismic Protection For Miscellaneous Equipment
15070 Seismic Protection For Mechanical Equipment
15080 Thermal Insulation for Mechanical Systems
15190 Gas Piping Systems
15181 Chilled Water and Condenser Water Piping and Accessories
15400 Plumbing, General Purpose
15565 Heating System: Gas-fired Heating
15569 Water and Steam Heating; Oil, Gas or Both; up to 20 MBTUH
15620 Liquid Chillers

15895 Air-Supply, Distribution, Ventilation, and Exhaust System
15990 Testing, Adjusting and Balancing of HVAC Systems
15995 Commissioning For HVAC Systems

The SECTION 15951 DIRECT DIGITAL CONTROL FOR HVAC and SECTION 02556 GAS DISTRIBUTION SYSTEM has been edited completely for this project and is to be considered as an extension of the Specification Requirements.

1.8.3 DESIGN ANALYSIS NARRATIVE

The narrative portion of the design analysis shall contain a narrative description and analysis for each of the mechanical portions of the design. The basis and reasons for specific engineering decisions, special features, unusual requirements, etc., shall be explained or summarized as applicable. If it is necessary to deviate from criteria or standard practice, reasons shall also be included. Design statements shall be provided in sufficient detail to enable the reviewer to get a clear picture and understanding of all included work so that approval will be granted. Narrative shall be complete relative to scope and intended design approaches. The total scope projected to final design shall be outlined in a form that will be conveniently adapted, expanded, and detailed at the final design stage. If alternatives were to be evaluated and selected by the designer, findings (pros and cons) and conclusions (Including Energy Budget analysis shall be included. The design analysis shall carry a complete narrative for every item and system covered in the design, and shall include, but not be limited to, the following:

HVAC and temperature control system performance test & functional performance checklists shall be included in the appropriate specifications.

1.8.3.1 Index

Provide a design analysis index identifying all main and sub-paragraph headings.

1.8.3.2 Project Summary

Provide a brief description of the mechanical design objectives.

1.8.3.3 Applicable Criteria

A list of all applicable criteria used for basis of design.

1.8.3.4 Technical Specifications

Edited list of technical Guide Specifications that will be used for the project.

1.8.3.5 Design Conditions

A list of Mechanical HVAC design conditions including elevation, latitude, heating/cooling degree days, winter and summer outside design temperatures, inside design temperatures for all spaces, ventilation rates, etc. shall be provided.

1.8.3.6 System Descriptions

Provide a complete description of all building systems; include the

designer's reasons for selecting specific materials, systems, etc. in which the reason for selection is not obvious. System descriptions shall be include, but not limited to, the following:

Plumbing Systems
Exterior Gas Distribution Systems
Interior Gas Piping Systems
Hot Water Heating Systems
Exhaust Hoods
Air Supply and Distribution Systems
Ventilation and Exhaust Systems
Temperature Control Systems
Seismic Protection
Chilled Water Systems
Refrigeration Systems
Infra-red systems

1.8.4 DESIGN ANALYSIS CALCULATIONS

The Design Analysis calculations shall provide an estimate of the heating, cooling, and ventilation loads to determine a preliminary selection of the type and size of mechanical equipment to be used. Design calculations shall be provided in sufficient detail to enable the reviewer to get a clear understanding of all work to allow approval. Backup data shall be furnished to support basic design decisions related to sizing of major equipment and materials, performance of specific systems or equipment. Manufacturer's catalog data sheets shall be provided for each item of equipment selected. Calculations may be performed by manual or computerized procedures. Use of standardized charts, curves, tables, graphs will generally be acceptable for portions of required calculations lieu of specific calculation procedures. Such data must be from a recognized source which is identified in the design analysis and shall be included with the calculations. Design calculations and computations shall be provided for all systems and shall include, but not limited to, the following:

1.8.4.1 Index

Provide a design analysis index identifying all calculation items.

1.8.4.2 Design Conditions

A list of Mechanical HVAC design conditions including elevation, latitude, heating/cooling degree days, winter and summer outside design temperatures, inside design temperatures for all spaces, ventilation rates, etc. shall be provided.

1.8.4.3 Zone Air-Conditioning Loads

Preliminary cooling calculations shall be prepared using the Cooling Load Temperature Differential/Cooling Load Factors (CLTD/CLF) Method as described in the ASHRAE Handbook Fundamentals including communications equipment room 117 & 173 and electrical equipment room 120.

1.8.4.4 Block Air-Conditioning Loads

Preliminary block cooling load calculations, compassing the air-conditioned areas, shall be prepared using the CLTD/DLF Method.

1.8.4.5 Chilled Water Pump Selections

Include pump flow calculations and catalog selection data indicating dimensions, connection sizes, rpm, horsepower, and efficiency.

1.8.4.6 Heating Loads

For each area or room requiring heat; provide calculations.

1.8.4.7 Heating Load Summary

A tabular summary of all heating load calculations for each area or room, including combustion air heating, shall be provided.

1.8.4.8 Boiler Selection

Include boiler capacity adjustments for altitude, inefficiency, and net rating. Provide catalog data indicating input capacity, net output capacity, dimensions, and water and flue size connections. If a high efficiency condensing type boiler(s) is proposed, insure the heating coils in all equipment are sized (larger) to take into account the lower return water temperature upon which these boilers are normally selected.

1.8.4.9 Hot Water Pump Selection

Include pump flow calculations and catalog selection data indicating dimensions, connection sizes, rpm, horsepower, and efficiency.

1.8.4.10 Combustion-Air Requirements

Include combustion air quantity and free area calculations, louver selection, combustion air heating requirements, and selection of heating equipment.

1.8.4.11 Unit Heater Selections

For each area requiring a unit heater, provide data on capacity, weight, and horsepower.

1.8.4.12 Mechanical Ventilation

For each area or room requiring mechanical ventilation for cooling; provide calculations similar to zone air-conditioning, louver selection, and catalog fan data.

1.8.4.13 Toilets/Janitor Room Ventilation

Provide calculations, catalog fan data, and louver selections, for each toilet area.

1.8.4.14 Air Handling Units

A tabular summary of all airflow calculations for each area or room shall be provided on each air distribution system for fan sizing. summary

1.8.4.15 Domestic Water Demand

Calculations for determining the size of the domestic cold water supply line to the building shall be provided.

1.8.4.16 Domestic Hot Water Demand

The design guidance provided for service water heating in ASHRAE Handbook HVAC Systems and Applications shall be followed to determine the domestic hot water demand for the facility. Provide catalog data for the domestic water heaters.

1.8.4.17 Electrical Load Summary

A summary of all mechanical equipment and the associated electrical load requirements shall be provided.

Addition calculations to be provided are:

pipe sizing calculations for the CW & HW, & gas piping systems

CW & HW pump head calculations

CW & HW expansion tank sizing

External static pressure calculations for all fans

Control valve Cv calculations

1.8.5 ENERGY CONSERVATION

Mechanical designs shall be economical, maintainable and energy conservative with full consideration given to the functional requirements and planned life of the facility. Emphasis shall be given to heat reclamation, outside air usage and other energy conservation measures for mechanical systems. Each major item of proposed mechanical equipment shall have a net efficiency rating that is equal to or exceeds the net efficiency ratings of similar or equal equipment of the four manufacturers each having one of the four highest ratings that meets the design criteria.

1.8.6 AIR POLLUTION CONTROL

Air pollution control shall be incorporated in all designs. The Architect-Engineer shall investigate the latest Using Service, Local, State, and Federal regulations and standards, analyze and report on requirements in the design analysis, and include in the design as applicable. The most stringent of all regulations and standards shall be implemented into the design. If in doubt as to requirements, contact this office for assistance.

1.8.7 Energy Analysis Narrative

The narrative portion of the energy analysis shall contain a narrative description and analysis for each of the mechanical portions of the design used to simulate the building systems. Energy analysis shall not be limited to mechanical systems, but, shall include building envelope, glazing, shading, electrical systems, as indicated in paragraph ENERGY BUDGET COMPLIANCE (EUB) CHECK in Section 01006. The basis and reasons for specific engineering decisions, special features, unusual requirements, etc., shall be explained or summarized as applicable. If it is necessary

to deviate from criteria or standard practice, reasons shall also be included. The total scope projected to final design shall be outlined in a form that will be conveniently adapted, expanded, and detailed at the final design stage. If alternatives were to be evaluated and selected by the designer, findings (pros and cons) and conclusions shall be included. The design analysis shall carry a complete narrative (including Energy Budget Analysis)for every item and system covered in the design, see section 01006 paragraph ENERGY BUDGET COMPLIANCE (EUB) CHECK and shall include, but not be limited to, the following:

a. Index

Provide a mechanical energy analysis index identifying all main and sub-paragraph headings.

b. Project Summary

Provide a brief description of the mechanical design systems simulated.

c. Applicable Criteria

A list of all applicable criteria used for basis of design.

d. Design Conditions

A list of Mechanical HVAC design conditions including elevation, latitude, heating/cooling degree days, winter and summer outside design temperatures, inside design temperatures for all spaces, ventilation rates, etc. shall be provided.

1.8.8 Life Cycle Cost Analysis (LCCA) (Where Required)

The narrative portion of the life cycle cost analysis shall contain a narrative description and analysis for each of the mechanical portions of the design used required to be compared for LCCA including but not limited to mechanical systems, shading, glazing, lighting, and other features of the building. The basis and reasons for specific engineering decisions, special features, unusual requirements, etc., shall be explained or summarized as applicable. If it is necessary to deviate from criteria or standard practice, reasons shall also be included. The total scope projected to final design shall be outlined in a form that will be conveniently adapted, expanded, and detailed at the final design stage. If alternatives were to be evaluated and selected by the designer, findings (pros and cons) and conclusions shall be included. The design analysis shall carry a complete narrative (including LCCA analysis)for every item and system required, see section 01006 paragraph and shall include, but not be limited to, the following:

a. Index

Provide a life cycle cost analysis index identifying all main and sub-paragraph headings.

b. Project Summary

Provide a brief description of the mechanical design LCCA systems required.

c. Applicable Criteria

A list of all applicable criteria used for basis of design.

1.9 ELECTRICAL

1.9.1 Drawings

Drawing scale shall match architectural drawing requirements. Drawings shall show the following:

1.9.1.1 Lighting Layout and List of Fixtures

Complete lighting layout of all areas shall be provided. The type of fixture shall be indicated on the drawing. Complete list of fixtures proposed with type of lamp and wattage.

1.9.1.2 Receptacle Layout

Complete receptacle layout should be provided for all areas to indicate project requirements.

1.9.1.3 Power Equipment and Layout

Power equipment and layout such as switchgear, panelboards, large motor driven items, etc.

1.9.1.4 Power One Line Diagram

Power one line diagram shall be shown to indicate arrangement of the system. Fault levels shall be shown with the one-line diagram or with indicated with the individual piece of equipment or a combination of both places.

1.9.1.5 Communications

Communications (telephone, public address) shall be shown sufficiently to indicate the designers understanding of the Section 01007 ELECTRICAL REQUIREMENTS.

1.9.1.6 Fire Detection

Fire Detection drawings shall be provided and inserted in the Fire Protection/Fire Suppression F-Series of drawings.

1.9.1.7 Miscellaneous Details of Special Equipment

Miscellaneous details of special equipment to indicate understanding of 01007 ELECTRICAL REQUIREMENTS.

1.9.1.8 Alarm Room Controls

Provide an input/output matrix for the alarm room operation.

1.9.2 Specifications

Submit prescriptive specification sections to specify the quality, characteristics, installation procedures and testing requirements for all items of the proposed electrical design.

Specifications shall be provided (to approximately 60 percent completion). See Section 01332 SUBMITTALS DURING DESIGN, paragraph 3.2, SPECIFICATIONS for additional requirements.

1.9.3 Design Analysis Narrative

The design analysis shall contain a description and analysis of the electrical portions of the design. Special features, unusual requirements, etc., should be noted. Narrative must address all technical requirements identified in Section 01007 ELECTRICAL REQUIREMENTS.

1.9.4 Design Analysis Calculations

Backup data shall be furnished to support basic design decisions related to sizing of major equipment and materials. As a minimum the following shall be submitted.

1.9.4.1 Service

Sizing of building services EMD (Estimated Maximum Demand) for all the building loads.

1.9.4.2 Transformers

Sizing of general purpose dry type transformers.

1.9.4.3 Feeders

Sizing of main feeders.

1.9.4.4 Panelboards

Sizing of panelboards and distribution equipment.

1.9.4.5 Illumination Calculations

Data should identify target and calculated illumination levels for all typical rooms. Calculations should be adjusted to compensate for special applications such as irregularly shaped rooms, open sides, ceiling obstructions (beams, ductwork), corridors, etc. If the lumen method is used for corridor calculations, the calculations should be performed using a module in which the length doesn't exceed 3 times the width (2:1 ratio preferred).

Computations shall be based on the simple lumen method using coefficients of utilization corresponding to 80 percent ceiling and 50 percent wall reflectance factors in office type applications (white suspended ceilings and light colored unobstructed walls). The floor coefficient of utilization factor shall be 20 percent for most areas with dark carpeting or tile. Lower levels shall be used such as 50 percent/30 percent factors for applications with CMU walls, dark colors, irregular surfaces and/or structural obstructions. A maintenance factor of 0.7 shall be used for the typical application (this value shall be adjusted for non-typical applications - 0.75 or 0.8 for a well maintained office or lab with a filtered air supply, 0.65 for a mechanical room with minimal maintenance).

1.9.4.6 Short Circuit Evaluation

The maximum possible fault current at the building service should be

calculated using infinite bus. Fault levels shall be shown on the drawings.

1.9.4.7 Voltage Drop Determination

Provide voltage drop calculations in accordance with IEEE 241 to demonstrate that the voltage drop recommendations of NFPA 70 are satisfied.

Calculations must be in accordance with the NEC and applicable IEEE guidelines. The following or equivalent formula should be used Vd=I(R cos Q + j sin. Interpolation and projection techniques may be used (i.e., a calculation for a 120 foot feeder to a 225A panel would not be necessary if a calculation for a 130 foot feeder to a 225A panel had already been performed). Calculations must be sufficient to encompass the application range of the project.

Distribution system design for voltages over 600 volts shall be based on a maximum of 2% voltage drop.

Distribution, feeders and branch circuit system design shall be based on a maximum of 5% voltage drop from the transformer to the utilization equipment. This shall be split such that there will be 2% or less voltage drop from the transformer (service drop, service entrance, etc.) to the branch circuit panelboard (proportioned most economically between the service and feeder conductors) and 3% voltage drop or more on branch circuits.

1.9.4.8 Estimated Mean Demand (EMD)

EMD shall be calculated in accordance with NEC Article 220 for demand factors, in accordance with the direction below and in accordance with the NEC for design factors. Design factors are factors in the code such as continuous loads use 1.25 times the load and largest motor is times 1.25. EMD equals connected load times demand factor times design factor.

a. Incandescent Light Fixtures. Connected load shall be the sum of the lamp wattages. Use a demand factor of 80% to 100%.
b. HID and Fluorescent Light Fixtures. Connected load shall be the sum of lamp wattages and the ballast loss factors. Use a demand factor of 80% to 100%.
c. General use receptacles. Connected load shall be 180 VA for each receptacle with a maximum of six receptacles. Use demand factors per NEC Table 220-13.
d. Dedicated or Special equipment receptacles. Connected load shall be the nameplate rating of the equipment or it shall be the receptacle rating. Demand factor shall be 75% to 100%.
e. Fixed equipment. Connected load shall be the nameplate rating. Demand factor shall be 75% to 100%.
f. Electric kitchen equipment. Connected load shall be the nameplate rating. Demand factors shal comply with NEC Article 220.
g. Motors. Connected load shall be the nameplate rating. Demand factor shall be 80% to 100% and shall comply with Article 220.
h. Spares. Equipment such as transformers, panelboards, switchgear, swtichboards, and motor control centers shall have 25% spare capacity.

1.10 FIRE PROTECTION

1.10.1 DRAWINGS

Features of Fire Protection, their ratings, and the hazards requiring them,

shall be clearly indicated. Sprinkler and fire alarm/detection areas shall also be clearly indicated. Fire detection and sprinkler systems shall be laid out and detailed sufficiently to indicate the designers understanding of the Section 01008 FIRE PROTECTION REQUIREMENTS. When other functions co-exist with the fire protection functions, their integration shall be clearly indicated, with an analysis that describes how both functions will be served. Provide a separate, composite type floor plan which makes an accurate presentation of these various features and functions. As part of the submittal, provide a set of plans that shows emergency egress for the facility.

1.10.2 DESIGN ANALYSIS

The design analysis shall include a separate fire protection report containing, but not limited to, review statements and/or comments on the following items, where applicable.

a. Location and rating of fire walls and fire partitions.

b. Column, floor, and roof protection.

c. Path of travel for emergency egress and operation of panic exits.

d. Access to building for fire fighting.

e. Design and placement of fire and smoke stop doors.

f. Labeled windows, where required.

g. Venting of smoke.

h. Placement of hand fire extinguisher cabinets.

i. Type and adequacy of sprinkler system.

j. Building exterior fire protection facilities and building clearances.

k. Type of occupancy.

l. Zoning of fixed fire protection systems.

m. Type and adequacy of fire alarm and detection systems.

n. Fire alarm and detection systems alarm, trouble and supervisory point designations. .

o. Number and type of points of alarm and detection systems that are separately transmitted to the base or installation fire department.

p. Type of Construction.

q. Height and area limitation.

r. Flame-spread and smoke-developed ratings.

s. Water supplies for fire protection.

1.10.3 TECHNICAL GUIDE SPECIFICATIONS

None of the government provided guide specifications are required to be submitted at this design stage. However; any Contractor generated specifications required to meet the project specifics, or individual specification items added to the provided guide specifications shall be submitted for review. Note that guide specifications 13930, WET PIPE SPRINKLER SYSTEMS, FIRE PROTECTION and 13851, FIRE DETECTION AND ALARM SYSTEM, ADDRESSABLE are a part of this contract. As such they may be edited only for those portions that do not apply to this project. Note that this applies only to equipment items. Testing, qualifications, submittal requirements, etc., may not be modified or deleted. For the equipment items that do apply, no changes may be made. (Note: 13851, FIRE DETECTION AND ALARM SYSTEM, ADDRESSABLE has been edited by the Government, See Section 01332.

1.11 ENVIRONMENTAL PROTECTION, COMPLIANCE, AND PERMITS

Specification Section 01410, ENVIRONMENTAL PROTECTION, COMPLIANCE, AND PERMITS furnished with Division 1 of this RFP, contains requirements presently known to be required for environmental protection, compliance, and permits. It is the Contractor's responsibility to provide any additional requirements to ensure that the project is in full environmental compliance with Federal, State, Regional and local laws and regulations. All new environmental requirements shall be submitted with the 60% Design Review Submittal.

1.11.1 Design Analysis Chapter

The Contractor shall prepare a chapter in the Design Analysis entitled: "ENVIRONMENTAL PROTECTION, COMPLIANCE, AND PERMITS". This chapter shall include a summary of environmental coordination, compliance, approvals, permits, and etc. required for the project. The Contractor shall include documentation of the coordinations, discussions, phone conversation records, and/or letters required to assure that the project is in full compliance with all Federal, State, Regional, and local environmental laws and regulations. A list of environmental permits, approvals, notifications, etc. that are required for the project shall be included.

1.11.2 Draft Environmental Protection Plan

The Contractor shall prepare and submit a Draft Environmental Protection Plan in accordance with the requirements of Section 01410 ENVIRONMENTAL PROTECTION, COMPLIANCE, AND PERMITS. If additional environmental compliance plans are identified, the Contractor shall submit the additional environmental plans and/or attachments.

1.11.3 Submittal of Environmental Permits, Notices, Reviews and/or Permit Applications and Associated Documents

As an Appendix to the Draft Environmental Protection Plan, the Contractor shall submit copies of all environmental permits, notices, reviews, and/or approvals that are required for the project. Copies of the applications and associated documents required by the the environmental permits, notices, reviews, and/or approvals shall be included in the Environmental Protection Plan Appendix.

1.12 SUSTAINABLE DESIGN AND DEVELOPMENT REQUIREMENTS

Complete the summary list and cost of all planned sustainable design and development points, items and features and incorporate into the design of

this facility based on the SPiRiT Rating System.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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PART 3 - CODE ANALYSIS
UNIFORM BUILDING CODE (UBC) AND NFPA "LIFE SAFETY CODE" ANALYSIS

LIFE SAFETY AND FIRE PROTECTION IS AN INTEGRAL PART OF EVERY FACILITY DESIGN. RECOGNIZED CODES AND ACCEPTED SAFETY STANDARDS SHALL BE FOLLOWED IN THE DESIGN OF ALL FACILITIES. OF THE VARIOUS CODES AND SAFETY STANDARDS THE NATIONAL FIRE PROTECTION ASSOC. (NFPA) "LIFE SAFETY CODE" SHALL TAKE PRECEDENCE. ALL APPLICABLE REQUIREMENTS OF THE LIFE SAFETY CODE SHALL BE INCORPORATED INTO EACH DESIGN. FOR TYPE OF CONSTRUCTION, FIRE AREA LIMITATIONS, AND ALLOWABLE BUILDING HEIGHTS THE DESIGN SHALL FOLLOW THE UNIFORM BUILDING CODE (UBC).

CHECK LIST

PROJECT NAME _____ DATE_____
LOCATION _____
_____

4. **UNIFORM BUILDING CODE ANALYSIS**

4.1 OCCUPANCY CLASSIFICATION (See Table 5A):

Area: Classification:
(GROUP: _____): Div. _____
(GROUP: _____): Div. _____
(GROUP: _____): Div. _____

PRINCIPAL OCCUPANCY _____

OTHERS (SPECIFY) _____
_____
_____
_____

4.2 TYPE OF CONSTRUCTION : _____

4.3. OCCUPANCY SEPARATION REQUIRED (SEE TABLE 5-B):

_____ TO _____ = _____ HRS
_____ TO _____ = _____ HRS
_____ TO _____ = _____ HRS
_____ TO _____ = _____ HRS
_____ TO _____ = _____ HRS

4.4 FIRE RESISTANCE OF EXTERIOR WALLS: (SEE TABLE 5-A)

NORTH _____
SOUTH _____
EAST _____
WEST _____
OTHER _____

PART 3 - CODE ANALYSIS

UNIFORM BUILDING CODE (UBC) AND NFPA "LIFE SAFETY CODE" ANALYSIS

4. UNIFORM BUILDING CODE ANALYSIS

4.5 OPENINGS IN EXTERIOR WALLS: (SEE TABLE 5-A)

NORTH _____
SOUTH _____
EAST _____
WEST _____
OTHER _____

4.6 MAX. ALLOWABLE FLOOR AREA (SEE TABLE 5-C):

ALLOWABLE:

IF SPRINKLERED: _____

ALLOW. AREA INCREASES _____
_____
_____
_____
_____

CALCULATED ACTUAL FLOOR AREA:

Floor	Square Footage
Totals:	

4.7 MAX. ALLOWABLE HEIGHT (SEE TABLE 5-D):

FEET: _____
STORIES: _____

Proposed Height of Building:

Actual No. of Stories:

4.8 COMMENTS:
_____
_____
_____
_____
_____

DESIGNER:_____

PART 3 - CODE ANALYSIS

UNIFORM BUILDING CODE (UBC) AND NFPA "LIFE SAFETY CODE" ANALYSIS

5. **NFPA 101 "LIFE SAFETY CODE"**

5.1 CLASSIFICATION OF OCCUPANCY: _____
_____

HAZARD OF CONTENTS:
LOW _____
_____
_____

ORDINARY _____
_____
_____

HIGH _____
_____
_____

5.2. FIRE RESISTIVE REQUIREMENTS:

EXTERIOR WALLS: _____ HRS ____

INTERIOR WALLS: _____ HRS ____

STRUCTURAL FRAME: _____ HRS ____

VERTICAL OPENINGS: _____ HRS ____

FLOORS: _____ HRS ____

ROOFS: _____ HRS ____

EXTERIOR DOORS: _____ HRS ____

EXTERIOR WINDOWS: _____ HRS ____

BOILER ROOM ENCLOSURE _____ HRS ____

OTHER (LIST) _____ HRS ____
_____ HRS ____
_____ HRS ____
_____ HRS ____

PART 3 - CODE ANALYSIS

UNIFORM BUILDING CODE (UBC) AND NFPA "LIFE SAFETY CODE" ANALYSIS

5. **NFPA 101 "LIFE SAFETY CODE"**

5.3 MEANS OF EGRESS:

OCCUPANCY LOAD FACTOR: _____

OCCUPANCY	FACTOR	ACTUAL AREA	ACTUAL LOAD

5.4 NUMBER OF EXITS REQUIRED: _____

_____
_____
_____
_____

5.5 MINIMUM WIDTH OF EXITS:
CALCULATED: _____
_____
_____
ACTUAL: _____
_____

5.6 MAXIMUM ALLOWABLE TRAVEL DISTANCE TO EXIT:_____
_____
WITH SPRINKLERS: _____
_____

5.7 EXIT DOORS:
MINIMUM WIDTH ALLOWED:_____
MAXIMUM LEAF WIDTH ALLOWED: _____
WIDTH REQUIRED FOR NO.OF OCCUPANTS: _____
_____

PART 3 - CODE ANALYSIS

UNIFORM BUILDING CODE (UBC) AND NFPA "LIFE SAFETY CODE" ANALYSIS

5. **NFPA 101 "LIFE SAFETY CODE"**

5.8 EXIT CORRIDORS:

MAX. COMMON PATH OF TRAVEL: _____
MINIMUM ALLOWABLE WIDTH: _____
REQUIRED TO HAVE EXIT AT EACH END OF CORRIDOR? ___
_____
DEAD END CORRIDORS ALLOWED? _____
MAXIMUM LENGTH: _____
WALL FIRE RESISTANCE REQUIRED: _____
_____
_____
DOORS & FRAME FIRE RESISTANCE REQUIRED: _____
_____
_____

5.9 STAIRS:

MINIMUM WIDTH _____ FOR OCCUP. LOAD OF _____
MINIMUM WIDTH _____ FOR OCCUP. LOAD OF _____
MINIMUM WIDTH _____ FOR OCCUP. LOAD OF _____
MINIMUM WIDTH _____ FOR OCCUP. LOAD OF _____

MAX. RISER ALLOWED: _____
MINIMUM TREAD ALLOWED: _____

LANDINGS:
MIN. SIZE: _____
MAX. VERTICAL DIST. BETWEEN LANDINGS: _____
_____
_____
REQUIRED HEIGHT OF RAILINGS: _____
_____

HANDRAILS:
REQUIRED AT EACH SIDE? _____
INTERMEDIATE RAIL REQUIRED? _____
HEIGHT ABOVE NOSING _____
INTERMEDIATE RAIL REQUIRED? _____
MAX. SPACE ALLOWED BETWEEN RAILS: _____
_____

STAIR ENCLOSURE REQUIRED? _____

STAIR TO ROOF REQUIRED? _____

STAIR TO BASEMENT REQUIRED? _____

5.10 HATCHWAY ACCESS TO ROOF REQUIRED? _____

PART 3 - CODE ANALYSIS

UNIFORM BUILDING CODE (UBC) AND NFPA "LIFE SAFETY CODE" ANALYSIS

5. **NFPA 101 "LIFE SAFETY CODE"**

5.11 LADDER ACCESS TO ROOF REQUIRED? _____

5.12 HORIZONTAL EXIT REQUIREMENTS: _____
_____
_____

5.13 PROTECTION OF OPENINGS NEAR EXTERIOR STAIR EXIT DOORS:
_____
_____

5.14 SMOKEPROOF ENCLOSURE REQUIRED: _____
_____

5.15 RAMPS:
MAX. SLOPE TO USE AS EXIT _____
HANDRAILS REQUIRED? _____

5.16 COMMENTS:
_____
_____
_____
_____
_____
_____

DESIGNER: _____

FOLLOWING IS A LIST OF ADDITIONAL "NFPA" CODES THAT ARE COMMONLY USED. INDICATE WHICH OF THESE CODES ARE USED AND ADD THOSE REQUIREMENTS TO THIS ANALYSIS.

MIL HDBK- 1008C FIRE PROTECTION FOR FACILITIES, ENGR, DESIGN AND CONSTRUCTION.
NFPA 10 FIRE EXTINGUISHERS, PORTABLE
NFPA 80 FIRE DOORS AND WINDOWS

ADA ARCHITECTURAL DESIGN CHECKLIST

Project Name:_____

Project Location:_____

Design Phase:_____

ITEM NO.	INCORP	INCORP LATER	N/A
1. Established with the Base/owner of the facility the for handicap accessibility.	_____	_____	_____
2. Received a waiver for no handicap accessibility requirements on the facility.	_____	_____	_____
3. Facility is designed utilizing:			
New Construction Criteria	_____	_____	_____
Building Alteration Criteria	_____	_____	_____
Historic Building Preservation Criteria:	_____	_____	_____
4. Accessible Route (egress/corridors/halls/aisles).			
- Provided minimum fire egress routes.	_____	_____	_____
- Provided minimum site accessible routes.	_____	_____	_____
- Provided proper clearance widths.	_____	_____	_____
- Provided proper floor level changes.	_____	_____	_____
- Provided proper floor materials.	_____	_____	_____
- Provided protection from protruding objects.	_____	_____	_____

ITEM NO.	INCORP	INCORP LATER	N/A
5. Ramps:			
- Maximum slopes less than 1:12	_____	_____	_____
- Maximum run less than 9144mm for 1:12 slopes 12,192mm for 1:16 slopes	_____	_____	_____
- Minimum clear width exceeds 914mm.	_____	_____	_____
- Provided proper edge protection.	_____	_____	_____
- Provided handrails of proper configuration and diameter.	_____	_____	_____
- Provided proper handrail extensions at top and bottom of ramp.	_____	_____	_____
- Provided handrails at proper mounting heights.	_____	_____	_____
- Provided proper landings.	_____	_____	_____
- Provided proper cross slope on ramp surface.	_____	_____	_____
6. Stairs:			
- Protected the space below stairs from access by the blind.	_____	_____	_____
- Provided handrails of proper configuration and diameter.	_____	_____	_____
- Provided proper handrail extensions at top and bottom of stairs.	_____	_____	_____
- Provided handrails at proper mounting heights.	_____	_____	_____
- Provided treads greater than 279mm in width.	_____	_____	_____
- Provided proper nosings.	_____	_____	_____
7. Elevators:			
- Provided buttons and lanterns at the proper mounting height.	_____	_____	_____
- Provided Braille characters.	_____	_____	_____
- Provided proper door widths.	_____	_____	_____
- Provided proper clearance inside elevator car.	_____	_____	_____

ITEM NO.	INCORP	INCORP LATER	N/A
8. Doors And Hardware:			
- Provided proper door widths.	_____	_____	_____
- Provided proper clearance on both sides of jambs.	_____	_____	_____
- Entrance vestibules provided with adequate clearances.	_____	_____	_____
- Provided levers on locksets and exit hardware.	_____	_____	_____
- Provided closers with mechanical adjustments.	_____	_____	_____
- Provided accessible thresholds.	_____	_____	_____
- Provided protection plates on doors heavily used by wheel chair bound people.	_____	_____	_____
9. Toilet Facilities:			
- Provided proper floor clearance through out the toilet rooms.	_____	_____	_____
- Provided minimum number of required accessible fixtures.	_____	_____	_____
- Provided accessible toilet stalls.	_____	_____	_____
- Provided stall doors with correct direction of swing.	_____	_____	_____
- Provided accessible water closets.	_____	_____	_____
- Provided grab bars at accessible water closets.	_____	_____	_____
- Provided grab bars with correct configuration and dimension.	_____	_____	_____
- Provided accessible sinks/lavatories.	_____	_____	_____
- Provided accessible urinals.	_____	_____	_____
- Provided accessible water coolers and fountains.	_____	_____	_____
- Provided accessible mirrors.	_____	_____	_____
- Provided accessible toilet accessories at required locations.	_____	_____	_____
- Provided all fixtures and accessories at proper mounting heights and clearances.	_____	_____	_____
- Provided insulated or protected exposed pipes at lavatories.	_____	_____	_____
10. Shower/Tub Facilities:			
- Provided the minimum number of accessible showers/tubs.	_____	_____	_____
- Provided showers/tubs with grab bars.	_____	_____	_____
- Provided showers/tubs with seats as required.	_____	_____	_____
- Provided controls mounted at the proper height and location.	_____	_____	_____
- Provided proper clearances and dimensions in showers/tubs.	_____	_____	_____
- Provided proper floor clearance through out shower/tubs rooms.	_____	_____	_____
- Provided doors with correct direction of swing and clearance.	_____	_____	_____

ITEM NO.	INCORP	INCORP LATER	N/A
11. Storage:			
- Provided accessible cabinets, shelves, closets, and drawers as required.	_____	_____	_____
- Provided proper clearance, mounting heights, and reach provisions.	_____	_____	_____
12. Telephones and Vending:			
- Provided the minimum number of required accessible public telephones.	_____	_____	_____
- Provided proper floor clearance around telephone.	_____	_____	_____
- Phone and controls mounted at proper heights and within reach.	_____	_____	_____
- Provided vending machines on an accessible route.	_____	_____	_____
- Provided vending machines with accessible clearances and protruding object safe guards.	_____	_____	_____
13. Fixed Or Built-in Seating And Tables:			
- Provided the minimum number of accommodations for accessibility in areas which required fixed furniture.	_____	_____	_____
- Provided proper floor clearance around furniture.	_____	_____	_____
- Provide proper knee space at tables.	_____	_____	_____
- Provided tables and counters with proper top surface heights.	_____	_____	_____
14. Assembly Areas:			
- Provided the minimum number of accessible seating spaces.	_____	_____	_____
- Provided seating which is easily accessible to emergency egress.	_____	_____	_____
- Provided companion seating.	_____	_____	_____
- Integrated and dispersed accessible seating with the rest of the seating.	_____	_____	_____
- Provided accessible dressing rooms.	_____	_____	_____
- Provided level floor surface at accessible seat locations.	_____	_____	_____
- Provided clear ground or floor space at accessible seat locations	_____	_____	_____
- Provided access to all performing areas and associated spaces.	_____	_____	_____

ITEM NO.	INCORP	INCORP LATER	N/A
15. Dining Halls And Cafeterias:			
- Provided the minimum number of accessible dining spaces.	_____	_____	_____
- Provided accessible counters and bars.	_____	_____	_____
- Provided accessible aisles between tables or walls.	_____	_____	_____
- Provided clear floor space at accessible dining locations.	_____	_____	_____
- Provided accessible food service lines meeting minimum clearances and reaches.	_____	_____	_____
- Provided accessible tableware and condiment areas.	_____	_____	_____
- Provided raised speaker platform with protected edges.	_____	_____	_____
16. Medical Care Facilities:			
- At least 10% of the general patient rooms are accessible.	_____	_____	_____
- Provided the number of accessible patient rooms as required for specialized treatment, long term care, or alterations of existing patient rooms.	_____	_____	_____
- Provided at least one accessible entrance with weather protecting canopy or roof overhang.	_____	_____	_____
- Provided minimum clearances within the patient rooms and around the beds.	_____	_____	_____
- Provided accessible patient toilet/bath rooms.	_____	_____	_____
17. Business And Mercantile:			
- Provided at least one accessible sales counter, services counter, teller, information window, etc.	_____	_____	_____
- Security bollards when provided, do not prevent access or egress to people in wheel chairs.	_____	_____	_____

ITEM NO.	INCORP	INCORP LATER	N/A
18. Libraries:			
- Provided access to all reading and stack areas, reference reference rooms, reserve areas, and special facilities or collections.	_____	_____	_____
- Provided at least 5% or a minimum of one of each element or fixed seating, tables, or study carrels as accessible.	_____	_____	_____
- Provided at least one lane of check out areas as accessible.	_____	_____	_____
- Provided adequate clearance and reach distances at card catalogs and magazine displays.	_____	_____	_____
- Provide stacks with minimum clear aisle width.	_____	_____	_____
19. Temporary Lodging:			
- All common and public use areas are accessible.	_____	_____	_____
- Provided accessible units, sleeping rooms, and suites.	_____	_____	_____
- Provided sleeping accommodations for persons with hearing impairments.	_____	_____	_____
- Provided a dispersed class and a range of room options.	_____	_____	_____
- Provided accessible rooms in ADAL projects.	_____	_____	_____
- Provided an accessible route to accessible sleeping rooms.	_____	_____	_____
- Provided accessible clearance widths within sleeping rooms and around beds.	_____	_____	_____
- Provided accessible doors within accessible sleeping rooms.	_____	_____	_____
- Provided accessible fixed or built-in furniture and storage units.	_____	_____	_____
- Provided accessible controls throughout accessible units.	_____	_____	_____
- Where provided as part of an accessible unit each of the following were provided as accessible: living area, dining area, at least one sleeping area, patio/terrace/ balcony, toilet/bath, and carport/garage/parking.	_____	_____	_____
- Where provided as apart of an accessible unit, the kitchen, kitchenettes, wet bars, or similar amenities were also provided with accessible features.	_____	_____	_____
- Provided visual alarms, notification devices, and accessible telephones.	_____	_____	_____
- Provided accessible doors and doorways designed to allow passage into and within all sleeping units or other covered units.	_____	_____	_____

20. Transportation Facilities:

(This section covers Air, Rail, and Bus public transportation facilities. See Section 10 of the ADA Guide for specific requirements for these facilities)

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SPIRIT V 1.4.1 EVALUATION
Project: Fort Carson Fire Station

Most Recent Comments Recorded on (Date):

SPiRiT PREREQUISITES/ CREDITS	REQUIREMENT	POINTS AVAIL.	YES	PROBABLE	MAYBE	NO	COMMENTS	SUSTAINABLE REVIEW COMMENTS/ ACTION ITEMS	ESTIMATED ADDITIONAL COST	NOTES RE. ROI
1.0 SUSTAINABLE SITES (S)										
1.R1 Site Prerequisite: Erosion, Sedimentation, and Water Quality Control	Design to a site sediment and erosion control plan that conform to best management practices in the EPA's Storm Water Management for Construction Activities, Chapter 3, OR local Erosion and Sedimentation Control standards and codes, which ever is more stringent. The plan shall meet the following objectives: Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse. Prevent sedimentation of storm sewer or receiving streams and/or air pollution with dust and particulate matter.	REQ'D.	X							
1.C1 Site Credit 1: Site Selection	Do not develop buildings on portions of sites that meet any one of the following criteria: Land whose elevation is lower than 5 ft. above the 100 year flood as defined by FEMA. Prime training or manuever land.	1								
	Select site based on functional adjacencies/relationships and land use compatibility.	1								
1.C2 Site Credit 2: Installation/Base Redevelopment	Increase localized density to conform to existing or desired density goals by utilizing sites that are located within existing cantonment areas of high development density.	1								

SPiRiT PREREQUISITES/ CREDITS	REQUIREMENT	POINTS AVAIL.	YES	PROBABLE	MAYBE	NO	COMMENTS	SUSTAINABLE REVIEW COMMENTS/ ACTION ITEMS	ESTIMATED ADDITIONAL COST	NOTES RE. ROI
	Select site close to existing roads and utilities or use an existing structure to minimize the need for new infrastructure	1								
1.C3 Site Credit 3: Brownfield Redevelopment	Develop on a site classified as a brownfield and provide remediation as required by EPA's Brownfield Redevelopment program requirements OR Develop a brownfield site (a site that has been contaminated by previous uses).	1								
1.C4 Site Credit 4: Alternative Transportation	Locate building within ½ mile of installation/base transit system	1								
	Provide suitable means for securing bicycles, with convenient changing/shower facilities for use by cyclists, for 5% or more of building occupants.	1								
	Locate building within 2 miles of alternative-fuel refueling stations	1								
	Size parking capacity to meet only minimum installation cantonment requirements AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants, OR, add no new parking for rehabilitation projects AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants..	1								

SPiRiT PREREQUISITES/ CREDITS	REQUIREMENT	POINTS AVAIL.	YES	PROBABLE	MAYBE	NO	COMMENTS	SUSTAINABLE REVIEW COMMENTS/ ACTION ITEMS	ESTIMATED ADDITIONAL COST	NOTES RE. ROI
1.C5 Site Credit 5: Reduced Site Disturbance	On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walkways, and main utility branch trenches, and 25 feet beyond pervious paving areas that require additional staging areas in order to limit compaction in the paved area; OR, on previously developed sites, restore a minimum of 50% of the remaining open area by planting native or adapted vegetation.	1								
	Reduce the development footprint (including building, access roads and parking) to exceed the installation/base's/base's master plan local zoning's open space requirement for the site by 25% or in accordance with installation/base policy on open space set asides, whichever is greater.	1								
1C.6 Site Credit 6: Stormwater Management	Implement a stormwater management plan that results in: No net increase of stormwater runoff from undeveloped to developed conditions.	1								
	Treatment systems designed to remove 80% of the average annual post development total suspended solids (TSS), and 40% of the average annual post development total phosphorous (TP), by implementing Best Management Practices (BMPs) outlined in EPA's Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (EPA-840-B-92-002 1/93).	1								

SPiRiT PREREQUISITES/ CREDITS	REQUIREMENT	POINTS AVAIL.	YES	PROBABLE	MAYBE	NO	COMMENTS	SUSTAINABLE REVIEW COMMENTS/ ACTION ITEMS	ESTIMATED ADDITIONAL COST	NOTES RE. ROI
1.C7 Site Credit 7: Landscape and Exterior Design to Reduce Heat Islands	Provide shade (within 5 years) on at least 30% of non-roof impervious surface on the site, including parking lots, walkways, plazas, etc., OR, use light-colored/high-albedo materials (reflectance of at least 0.3) for 30% of the site's non-roof impervious surfaces, OR place a minimum of 50% of parking space under-ground OR use open-grid pavement system (net impervious area of LESS than 50%) for a minimum of 50% of the parking lot area.	1								
	Use ENERGY STAR Roof-compliant, high-reflectance roofing AND low-emissivity roofing (initial reflectance of at least .65 and three-year-aged reflectance of at least .5) for a minimum of 75% of the roof surface; OR, install a "green" (vegetated) roof for at least 50% of the roof area.	1								
1.C8 Site Credit 8: Light Pollution Reduction	Meet Illuminating Engineering Society of North America (IESNA) footcandle level requirements as stated in the Recommended Practice Manual: Lighting for Exterior Environments, AND design interior and exterior lighting such that zero direct-beam illumination leaves the building site.	1								
1.C9 Site Credit 9: Optimize Site Features	Maximize the use of free site energy. Plan facility, parking and roadways to fit existing contours and limit cut and fill.	1								
1.C10 Site Credit 10: Facility Impact	Cluster facilities to reduce impact, access distance to utilities and sufficient occupant density to support mass transit.	1								
	Collaborate with installation and community planners to identify and mitigate potential impacts of the project beyond site boundaries, and transportation planners to insure efficient public transport.	1								
1.C11 Site Credit 11: Site Ecology	Develop site environmental management and mitigation plan	1								
2.0 WATER EFFICIENCY (W)										

SPiRiT PREREQUISITES/ CREDITS	REQUIREMENT	POINTS AVAIL.	YES	PROBABLE	MAYBE	NO	COMMENTS	SUSTAINABLE REVIEW COMMENTS/ ACTION ITEMS	ESTIMATED ADDITIONAL COST	NOTES RE. ROI
2.C1 Water Credit 1: Water Efficient Landscaping	Use high efficiency irrigation technology, OR, use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means	1								
	Use only captured rain or recycled site water for an additional 50% reduction (100% total reduction) of potable water for site irrigation needs, OR, do not install permanent landscape irrigation systems.	1								
2.C2 Water Credit 2: Innovative Wastewater Technologies	Reduce the use of municipally provided potable water for building sewage conveyance by a minimum of 50%, OR, treat 100% of wastewater on site to tertiary standards.	1								
2.C3 Water Credit 3: Water Use Reduction	Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act of 1992 fixture performance requirements.	1								
	Exceed the potable water use reduction by an additional 10% (30% total efficiency increase).	1								
3.0 ENERGY and ATMOSPHERE (E)										
3.R1 Prerequisite 1: Fundamental Building Systems Commissioning	Implement all of the following fundamental best practice commissioning procedures. Engage a commissioning authority. Develop design intent and the basis of design documentation. Include commissioning requirements in the construction documents. Develop and utilize a commissioning plan. Verify installation, functional performance, training and documentation. Complete a commissioning report.	REQ'D.	X							
3.R2 Prerequisite 2: Minimum Energy Performance	Design to meet building energy efficiency and performance as required by TI 800-01 (Design Criteria)	REQ'D.	X							

SPiRiT PREREQUISITES/ CREDITS	REQUIREMENT	POINTS AVAIL.	YES	PROBABLE	MAYBE	NO	COMMENTS	SUSTAINABLE REVIEW COMMENTS/ ACTION ITEMS	ESTIMATED ADDITIONAL COST	NOTES RE. ROI
3.C5 Energy Credit 5: Measurement and Verification	Comply with the installed equipment requirements for continuous metering as stated in selected Measurement and Verification Methods Option B: Retrofit Isolation of the US DOE's International Performance Measurement and Verification Protocol (IPMVP) for the following: Lighting systems and controls. Constant and variable motor loads. Variable frequency drive (VFD) operation. Chiller efficiency at variable loads (kW/ton). Cooling load. Air and water economizer and heat recovery cycles. Air distribution static pressures and ventilation air volumes. Boiler efficiencies. Building specific process energy efficiency systems and equipment. Indoor water risers and outdoor irrigation systems.	1								
3.C6 Energy Credit 6: Green Power	Engage in a two year contract to purchase the amount of power equal to projected building consumption generated from renewable sources that meet the Center for Resource Solutions (CRS) Green-E requirements.	1								
3.C7 Energy Credit 7: Distributed Generation	Reduce total energy usage and emissions by considering source energy implications and local cogeneration and direct energy conversion. Generate at least 50% of the building's projected annual consumption by on-site distributed generation sources.	1								
4.0 MATERIALS and RESOURCES (M)										
4.R1 Materials Prerequisite: Storage & Collection of Recyclables	Provide an easily accessible area that serves the entire building that is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, glass, plastics, and metals.	REQ'D.	X							
4.C1 Materials Credit 1: Building Reuse	Maintain at least 75% of existing building structure and shell (exterior skin and framing excluding window assemblies).	1								
	Maintain an additional 25% (100% total) of existing building structure and shell (exterior skin and framing excluding window assemblies).	1								

SPiRiT PREREQUISITES/ CREDITS	REQUIREMENT	POINTS AVAIL.	YES	PROBABLE	MAYBE	NO	COMMENTS	SUSTAINABLE REVIEW COMMENTS/ ACTION ITEMS	ESTIMATED ADDITIONAL COST	NOTES RE. ROI
	Maintain 100% of existing building structure and shell AND 50% non-shell (walls, floor coverings, and ceiling systems).	1								
4.C2 Materials Credit 2: Construction Waste Management	Develop and implement a waste management plan, quantifying material diversion by weight.	N/A								
	Recycle and/or salvage at least 50% (by weight) of construction, demolition, and land clearing waste.	1								
	Recycle and/or salvage an additional 25% (75% total by weight) of the construction, demolition, and land clearing debris.	1								
4.C3 Materials Credit 3: Resource Reuse	Specify salvaged or refurbished materials for 5% of building materials.	1								
	Specify salvaged or refurbished materials for 10% of building materials.	1								
4.C4 Materials Credit 4: Recycled Content	Specify a minimum of 25% of building materials that contain in aggregate a minimum weighted average of 20% post-consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material.	1								
	Specify an additional 25% (50% total) of building materials that contain in aggregate, a minimum weighted average of 20% post-consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material.	1								
4.C5 Materials Credit 5: Local/Regional Materials	Specify a minimum of 20% of building materials that are manufactured regionally within a radius of 500 miles.	1								
	Of these regionally manufactured materials, specify a minimum of 50% that are extracted, harvested, or recovered within 500 miles.	1								

SPiRiT PREREQUISITES/ CREDITS	REQUIREMENT	POINTS AVAIL.	YES	PROBABLE	MAYBE	NO	COMMENTS	SUSTAINABLE REVIEW COMMENTS/ ACTION ITEMS	ESTIMATED ADDITIONAL COST	NOTES RE. ROI
4.C6 Material Credit 6: Rapidly Renewable Materials	Specify rapidly renewable building materials for 5% of total building materials.	1								
4.C7 Material Credit 7: Certified Wood	Use a minimum of 50% of wood-based materials certified in accordance with the Forest Stewardship Council guidelines for wood building components including but not limited to framing, flooring, finishes, furnishings, and non-rented temporary construction applications such as bracing, concrete form work and pedestrian barriers.	1								
5.0 INDOOR ENVIRONMENTAL QUALITY (IEQ) [Q]										
5.R1 IEQ Prerequisite 1: Minimum IAQ Performance	Meet the minimum requirements of voluntary consensus standard ASHRAE 62-1999, Ventilation for Acceptable Indoor Air Quality and approved Addenda.	REQ'D.	X							
5.R2 IEQ Prerequisite 2: Environmental Tobacco Smoke (ETS) Control	Zero exposure of nonsmokers to ETS by prohibition of smoking in the building, OR, by providing a designated smoking room designed to effectively contain, capture and remove ETS from the building. At a minimum, the smoking room shall be directly exhausted to the outdoors with no recirculation of ETS-containing air to the non-smoking area of the building, enclosed with impermeable structural deck-to-deck partitions and operated at a negative pressure compared with the surrounding spaces of at least 7 Pa (0.03 inches of water gauge.) Performance of smoking rooms shall be verified using tracer gas testing methods as described in ASHRAE Standard 129-1997. Acceptable exposure in non-smoking areas is defined as less than 1% of the tracer gas concentration in the smoking room detectable in the adjoining non-smoking areas. Smoking room testing as described in the ASHRAE Standard 129-1997 is required in the contract documents and critical smoking facility systems testing results must be included in the building commissioning plan and report or as a separate document.	REQ'D.	X							

SPiRiT PREREQUISITES/ CREDITS	REQUIREMENT	POINTS AVAIL.	YES	PROBABLE	MAYBE	NO	COMMENTS	SUSTAINABLE REVIEW COMMENTS/ ACTION ITEMS	ESTIMATED ADDITIONAL COST	NOTES RE. ROI
5.C1 IEQ Credit 1: IAQ Monitoring	Install a permanent carbon dioxide (CO_2) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments, AND specify initial operational set point parameters that maintain indoor carbon dioxide levels no higher than outdoor levels by more than 530 parts per million at any time.	1								
5.C2 IEQ Credit 2: Increase Ventilation Effectiveness	For mechanically ventilation buildings, design ventilation systems that result in an air change effectiveness (E) greater than or equal to 0.9 as determined by ASHRAE 129-1997. For naturally ventilation spaces, demonstrate a distribution and laminar flow pattern that involves not less than 90% of the room or zone area in the direction of air flow for at least 95% of hours of occupancy.	1								
5.C3 IEQ Credit 3: Construction IAQ Management Plan	Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:									
	During construction meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995, AND protect stored on-site or installed absorptive materials from moisture damage, AND replace all filtration media immediately prior to occupancy (Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2- 1999).	1								
	Conduct a minimum two-week building flushout with new filtration media at 100% outside air after construction ends and prior to occupancy, OR, conduct a baseline indoor air quality testing procedure consistent with current EPA protocol for Environmental Requirements, Baseline IAQ and Materials, for the Research Triangle Park Campus, Section 01445.	1								

SPiRiT PREREQUISITES/ CREDITS	REQUIREMENT	POINTS AVAIL.	YES	PROBABLE	MAYBE	NO	COMMENTS	SUSTAINABLE REVIEW COMMENTS/ ACTION ITEMS	ESTIMATED ADDITIONAL COST	NOTES RE. ROI
5.C4 IEQ Credit 4: Low-Emitting Materials	Meet or exceed VOC limits for adhesives, sealants, paints, composite wood products, and carpet systems as follows:	N/A								
	Adhesives must meet or exceed the VOC limits of South Coast Air Quality Management District Rule #1168 by, AND all sealants used as a filler must meet or exceed Bay Area Air Resources Board Reg. 8, Rule 51.	1								
	Paints and coatings must meet or exceed the VOC and chemical component limits of Green Seal requirements.	1								
	Carpet systems must meet the Carpet and Rug Institute Green Label Indoor Air Quality Test Program.	1								
	Composite wood products must contain no added urea-formaldehyde or phenol-formaldehyde resins.	1								
5.C5 IEQ Credit 5: Indoor Chemical and Pollutant Source Control	Design to minimize cross-contamination of regularly occupied areas by chemical pollutants: Employ permanent entryway systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways, AND provide areas with structural deck to deck partitions with separate outside exhausting, no air recirculation and negative pressure where chemical use occurs (including housekeeping areas and copying/print rooms), AND provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.	1								
5.C6 IEQ Credit 6: Controllability of Systems	Provide a minimum of one operable window and one lighting control zone per 200 s.f. for all occupied areas within 15 feet of the perimeter wall.	1								
	Provide controls for each individual for airflow, temperature, and lighting for 50% of the non perimeter, regularly occupied areas.	1								
5.C7 IEQ Credit 7: Thermal Comfort	Comply with ASHRAE Standard 55-1992, Addenda 1995 for thermal comfort standards including humidity control within established ranges per climate zone.	1								

SPiRiT PREREQUISITES/ CREDITS	REQUIREMENT	POINTS AVAIL.	YES	PROBABLE	MAYBE	NO	COMMENTS	SUSTAINABLE REVIEW COMMENTS/ ACTION ITEMS	ESTIMATED ADDITIONAL COST	NOTES RE. ROI
	Install a permanent temperature and humidity monitoring system configured to provide operators control over thermal comfort performance and effectiveness of humidification and/or dehumidification systems in the building.	1								
5.C8 IEQ Credit 8: Daylight and Views	Achieve a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) in 75% of all space occupied for critical visual tasks, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas. Exceptions include those spaces where tasks would be hindered by the use of daylight or where accomplishing the specific tasks within a space would be enhanced by the direct penetration of sunlight.	1								
	Direct line of sight to vision glazing while seated from 90% of all regularly occupied spaces, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas	1								
5.C9 IEQ Credit 9: Acoustic Environment/ Noise Control	Minimize environmental noise through appropriate use of insulation, sound-absorbin materials and noise source isolation.	1								
5.C10 IEQ Credit 10: Facility In-Use IAQ Management Plan	Develop action plan for HVAC cleaning, facility education and monitoring	1								
6.0 FACILITY DELIVERY PROCESS										
6.C1 Facility Delivery Credit 1: Holistic Delivery of	Choose team leaders that are experienced in holistic delivery of facilities	1								

SPiRiT PREREQUISITES/ CREDITS	REQUIREMENT	POINTS AVAIL.	YES	PROBABLE	MAYBE	NO	COMMENTS	SUSTAINABLE REVIEW COMMENTS/ ACTION ITEMS	ESTIMATED ADDITIONAL COST	NOTES RE. ROI
	Train the entire team in holisitc delivery process. The team must include all stakeholders in the facility delivery, including the users, the contracting staff, the construction representatives, project manager, and desing/engineering team members.	1								
	Identify project goals and metrics.	1								
	Plan and execute charettes with team members at critical phases of the facility delivery.	1								
	Identify and resolve tradeoffs among sustainability, first costs, life cycle costs and mission requirements through charettes and other collaborative processes.	2								
	Document required results for each phase of project deliverables that achieve the project goals and are measureable throughout the facility life span.	1								
7.0 CURRENT MISSION										
7.C1 Current Mission Credit 1: Operation and Maintenance	Develop a facility operations and maintenance program to include: 1.) Commissioning instructions for all facility systems. 2.) Comprehensive facility operations and maintenance instructions for system operation, performance verification procedures and results, an equipment inventory, warrantee information, and recommended maintenance schedule. The instructions should include a comprehensive, preventive maintenance program to keep all facility systems functioning as designed. 3.) A periodic training program for occupants, facilities managers, and maintenance staff in all facility operations and maintenance activities. 4.) Instructions on sustainable cleaning and pest control practices. 5.) Develop a comprehensive site recycling/waste management plan.	2								

SPiRiT PREREQUISITES/ CREDITS	REQUIREMENT	POINTS AVAIL.	YES	PROBABLE	MAYBE	NO	COMMENTS	SUSTAINABLE REVIEW COMMENTS/ ACTION ITEMS	ESTIMATED ADDITIONAL COST	NOTES RE. ROI
	Provide surfaces, furnishings, and equipment that are appropriately durable, according to life cycle cost analysis.	1								
7.C2 Current Mission Credit 2: Soldier and Workplace Productivity and Retention	Provide a high quality indoor environment to enhance user/occupant quality of life (QOL)	1								
	Provide a highly functional work environment to promote user/occupant work productivity.	1								
	Provide a healthy and safe work environment to sustain QOL and productivity.	1								
8.0 FUTURE MISSIONS										

SPiRiT PREREQUISITES/ CREDITS	REQUIREMENT	POINTS AVAIL.	YES	PROBABLE	MAYBE	NO	COMMENTS	SUSTAINABLE REVIEW COMMENTS/ ACTION ITEMS	ESTIMATED ADDITIONAL COST	NOTES RE. ROI
8.C1 Future Missions Credit 1: Functional Life of Facility and Supporting Systems	Identify how long the designed function is likely to occupy the current facility	1								
	Identify how long the envelope, structure, HVAC, plumbing, communications, electrical, and other systems are likely to last before requiring replacement or upgrade. Consider economic, functional and physical obsolescence.	1								
8.C2 Future Missions Credit 2: Adaptation, Renewal and Future Use	Identify possible future uses for the facility, consider alternatives that expand the list of possible future uses. AND Design the building to accommodate as a wide range of future uses, as practical. AND Design the installation of building systems to accomodate foreseeable change with a minimum amount of disruption, cost, and additional materials.	1								
	Build the smallest facility necessary to meet current mission functional requirments, using the most efficient shape and form, while taking into consideration expansion capabilities and potential future mission requirements. AND Design the facility for recycling of materials and systems.	1								
FACILITY POINTS SUMMARY, CREDIT TOTALS		**100**	**0**	**0**	**0**	**0**				
SPiRiT CERTIFIED: Bronze: 25-34 Points; Silver: 35-49 Points; Gold: 50-74 Points; Platinum: 75-100 Points										

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SECTION 01338

100 PERCENT DESIGN REQUIREMENTS

PART 1 100 PERCENT DESIGN SUBMITTALS

For general submittal requirements, see Section 01332 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES.

1.1 SITE PLANNING

1.1.1 Drawings.

All drawings shall be completely dimensioned in metric units, labeled, and noted. All approved comments from the 60 Percent Design Submittal shall have been incorporated. Cross-reference applicable sheets for items shown. Drawings required:

Location Plan and Vicinity Map
Removal Plan(s)
Site Plan
Site Details
Landscape Plan
Landscape Details

1.1.1.1 Irrigation Plan

The contractor shall supply an Irrigation System Plan at the same scale as the Landscape Plan showing the landscape plan with the proposed turf and plant locations and the completely designed irrigation system with all necessary components and lines with their material types and sizes shown and delineated. All section valves shall be numbered and have the correct gallonage and pressure at which they operate.

1.1.1.2 Irrigation Details

Details of the irrigation equipment and system including valves, couplers, sprinkler heads, controllers, precipitation rates, pipe material, and total flow and pressure requirements.

1.1.2 Specifications

a. Provide complete edited specifications for all items. Technical specifications shall be complete and fully coordinated with the drawings. All specification indexes shall be completely edited to reflect the paragraphs retained in the body of the specification. All references that have not been used in the body of the specification shall be edited from the technical specification.

b. Specifications shall be coordinated with the plans and include only plant beds next to the building. Turf and plants and plant beds remote from the building are not to be irrigated. Special sections shall be prepared to cover those subjects for which no pattern guide specifications are available. All UFGS guide specifications, to be provided, shall be in edited form showing all text to be deleted and added.

1.1.3 Design Analysis Narrative

Design analysis shall include the following:

1.1.3.1 References

Provide design references used in preparing the site design.

1.1.3.2 Basis For Design

The Design Analysis should give the basis, specific goals, objectives and priorities for site design of the project. Identify, explain and document use of design criteria and how the design meets goals, objectives and priorities. Identify the preferred site development concept. Document pollution prevention measures and other environmental considerations made during the design process.

1.1.3.3 Irrigation System Calculations

A list of applicable criteria and/or design standards shall be provided. This shall include precipitation rates, allowable pipe material and calculations of total flow and presure requirements. Include a narrative description of the system and list any special requirements and/or systems.

1.2 CIVIL

1.2.1 Drawings

1.2.1.1 Grading and Drainage Plan

A final grading and drainage plan shall be provided at the same scale as the site plan. New and existing grading contours shall be indicated at 1 FOOT contour intervals. Indicate the finished floor elevation of the new building. Plans shall show the layout of the new and existing storm drainage and roof drainage systems. Uniform grades shall be labeled using slope arrows. Provide spot elevations at building corners, parking area corners, changes in grade, etc. Storm drainage lines and structures shall be labeled. The rim elevation of all manholes, curb inlets, and area inlets shall be indicated.

1.2.1.2 Not Used

1.2.1.3 Grading Sections

Provide a minimum of two grading sections (one east-west and the other north-south through the area of new grading work. These grading sections shall show new vs. existing grades, slopes of finished grades, finish floor elevations in the new building, and identification of main features such as parking areas, building, and walks.

1.2.1.4 Storm Drain Profiles

Provide profiles of all new storm drains showing new and existing grades, new and existing utilities, pavement sections in detail, pipe diameters and lengths, pipe slopes, invert elevations, etc. Class and gauge of all storm drain pipes shall be provided. This information may also be included in a Storm Drain Schedule. Profiles of roof drain runout lines may or may not be provided, at the Contractor's discretion. However, invert elevations,

lengths and pipe diameters of these roof drains shall be called out on the drawings.

1.2.1.5 Drainage Structure Details

Provide details of all storm drainage structures.

1.2.1.6 Pavement Details

Provide details of concrete curb and gutter, integral curb, typical pavement sections, typical sidewalk section, pavement utility cut details, and interface detail between new and existing pavement.

1.2.1.7 Not Used

1.2.1.8 Erosion Control Details

Provide details of best management practices used to control erosion.

1.2.2 Specifications

Provide complete edited specifications for all items. Technical specifications shall be complete and fully coordinated with the drawings. All specification indexes shall be completely edited to reflect the paragraphs retained in the body of the specification. All references that have not been used in the body of the specification shall be edited from the technical specification.

1.2.3 Design Analysis Narrative

Design analysis shall include the following:

1.2.3.1 References

Provide design references used in preparing the civil design.

1.2.3.2 Grading

A narrative of the grading design and criteria used.

1.2.3.3 Drainage

A narrative of the drainage design and criteria used. Include information on the storm drain pipe materials selected and their ability to withstand earth dead loads and live loads that will be imposed.

1.2.3.4 Pavements

A narrative of the pavement design and criteria used.

1.2.4 Design Analysis Calculations

1.2.4.1 Storm Drainage System Calculations

Storm Drainage System Calculations shall include the following:

a. Drainage area map showing boundaries of each drainage area

and respective drain inlet or culvert.

b. Storm run-off calculations for each drainage area.

c. Tabulation of capacities of new storm drains including: diameter and slope of storm drain pipes, design storm discharge and velocity for each storm drain pipe, maximum discharge capacity of each storm drain pipe, headwater depth of each culvert during design storm discharge.

d. Hydraulic capacity calculations for each new curb and area inlet.

1.2.4.2 Pavement Design Calculations

Calculations used to obtain the pavement design.

1.2.5 Storm Water Pollution Prevention Plan (SWPPP)

If construction activities results in disturbance of 5 acres of land or more, coverage under the EPA Storm Water General Permit For Construction Activities (Permit No. COR10*##F) is required and the Contractor shall be responsible for complying with the requirements of the attached Omaha District Guide Specification Section 01565 NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES. The Contractor and the Omaha District Corps of Engineers shall be co-permittees. If coverage under the General permit is not required, the attached Section 01565 shall not be applicable.

1.3 GEOTECHNICAL

1.3.1 Drawings

1.3.1.1 Boring Location Plan

A boring location plan shall be provided. The boring location plan shall be at the same scale used for the Site Plan. A copy of the boring location plan issued with this Request for Proposal (RFP) is part of the Final Foundation Analysis (Attachment No. 1).

1.3.1.2 Boring Log Sheet

Boring logs shall be provided on a separate sheet of the drawings. A copy of the boring logs issued with the RFP is part of the Final Foundation Report (Attachment No. 1).

1.3.2 Design Analysis

A copy of the Final Foundation Report (Attachment No. 1) shall be included as an appendix to the Design Analysis.

1.4 WATER SUPPLY AND WASTEWATER

1.4.1 Drawings

Generally, the corrected and approved 60 percent plans may be used as the

basis for the final plans. However, all details necessary for complete construction must be included. The 100 percent final design submittal shall include all the information presented in the 60 percent submittal, updated to final design status, corrected to reflect any changes made in response to review comments, and shall include the additional requirements specified hereinafter. Any concerns in developing the final design documents shall be resolved prior to starting the final design stage.

1.4.1.1 Water Distribution and Sewage Collection Systems Plans (including building services)

Provide all existing utilities and above ground features, including sizes and material types, which may pose as an obstacle (i.e., water, sewer, gas, electrical, etc.) on the basic site plan layout. Indicate existing pipe material and sizes where new lines connect along with the type of connection and elevations of connections. Provide all new water and sewer lines with sizes. This will include all new service lines, up to within the 1.5 meter building line. Locations of all new manholes, fire hydrants, valves (including PIV's), similar appurtenances, and connection points shall be provided. Show contours on plan view. Include stationing on both plan and profile sheets.

1.4.1.2 Water Distribution and Sewage Collection Systems Profiles

Profiles of all gravity sewers and waterlines shall be provided. Profiles may be omitted for short waterlines, unless necessary to assure adequate cover or avoid interference with other underground facilities. Indicate existing pipe material and sizes where new lines connect. Indicate type of connection and elevation. Include all interference elevations.

1.4.1.3 Water Distribution and Sewage Collection Systems Details

Appropriate water and sewer details shall be provided. Use Omaha District standard detail drawings. The standard detail sheets will be furnished if required. For roadway pavement crossings, indicate installation method (open cut, boring, jacking, etc.). Include standard casing details.

1.4.2 Specifications

Specifications shall be coordinated with the plans and include all items. Provide special sections to cover those subjects for which no UFGS guide specifications are used or available. These special sections shall include all approved changes from the 60 percent review stage. All UFGS guide specifications, to be provided, shall be in edited form showing all text to be deleted and added.

1.4.3 Design Analysis Narrative

Design analysis shall include the following and all applicable data contained in the 60 percent design analysis narrative shall be repeated. References shall not be made to the previous design analysis. The final design analysis shall be corrected to reflect changes in content made in response to review comments, and shall be expanded to reflect the completed design.

1.4.3.1 References

Provide design references used in preparing the water and wastewater design.

1.4.3.2 Water Supply and Distribution Systems

A narrative of the water supply and distribution systems design and applicable criteria used shall be provided. Include the peak and average domestic demands, the interior and exterior fire flow requirements and the available flow and residual pressures. A description of the water distribution system, and complete calculations necessary to support equipment, piping sizes, interior and exterior fire demands, and domestic demands, etc. shall be provided. The calculations for water and fire water line sizing shall be based on hydrant flow test data that is verified by the Corps of Engineers, Omaha District, Design Branch, Environmental Design Section.

1.4.3.3 Wastewater and Sewers

A narrative of the wastewater supply design and applicable criteria used shall be provided. Include the average and peak contributing flows along with the available capacity and full flow capacity of the existing system. A listing of allowable piping materials, and complete calculations necessary to support equipment and piping sizes shall be provided.

1.5 ARCHITECTURAL

1.5.1 Drawings

The drawings shall be complete, include all necessary and required details, thoroughly checked, and fully coordinated with the technical Specifications and all other Construction Documents. Previous comments and applicable criteria changes shall have been incorporated into the design. The contract drawings shall fully describe the type and the scope of work required. The layout of individual sheets and the organization of the assembled set shall follow and communicate a logical sequence. General information shall be presented first, progressing to more detailed information. When assembling details, begin in the upper left-hand corner of the sheet with letters progressing to the right and down. When dimensioning, use arrowheads, not dots or slashes. Where major structural elements are included as parts of architectural detailing, do not indicate sizes. These elements must be fully defined in the structural design documents. See 60% Architectural drawing submittal requirements for drawing scales of remaining drawings to be submitted. Include all drawings from the 60% submittal plus all additional detail drawings required for complete 100% design. These shall include but not be limited to the following:

Interior Elevations and Details
Door Details
Window Details
Louver Details
Roof Details
Stair Details
Casework Plans, Elevations, and Details
Wall Plan Details and Plan Details
Fire Wall Details and Penetration Conditions
Sealant Details
Ceramic Tile Details
Ceiling Details
Control/Expansion Joint Details
All Miscellaneous Details
All Floor & Wall Patterns/Borders

1.5.1.1 Color Rendering

At this phase, the Contractor shall provide the chosen sketch as an artist rendering of the completed facility with walks, parking, vehicles, landscaping, fencing, and other surrounding features. The overall framed size shall be approximately 30 inches x 36 inches, multi-colored, not computer generated, The rendering shall be an accurate and realistic representation of the form, massing, scale, and color of the actual design. Rendering shall be done in an opaque water color.

1.5.1.2 Framed Rendering

After approving the completed color rendering above, the Contractor shall submit at the 100% corrected design phase One (1) original and four (4) copies framed. Renderings shall be matted with #789, Granite mat board by Brainbridge or a matching color by another manufacturer. A double matting shall be provided with the interior mat a black, 3/16-inch to 1/4-inch exposure width.

Glazing shall be sheet plastic at least a minimum 1/8-inch thick. Frames are to be metal, flat black, 1-inch deep (wall to face) and with a 1/4-inch to 3/16-inch face width, depending upon the rendering size. The frame material can be obtained from Nielson Frames, but other manufacturers of the same profile and color are acceptable. Install adjustable devices and picture wire for hanging.

1.5.2 Technical Specifications

The technical specifications shall be complete and fully coordinated with the drawings. Special sections shall be prepared to cover those subjects for which no pattern guide specification is available. Notes to the Designer that accompany specifications shall be used in editing technical guide specifications. All specification indexes shall be completely edited to reflect the paragraphs retained in the body of the specification. All UFGS guide specifications shall be edited in accordance with Section 01332 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES.

1.5.3 Design Analysis Narrative

The Design Analysis shall include the basic information presented in the previous submittal, corrected to reflect changes in content made in response to review comments. Outline specifications shall be omitted from the Final Design Analysis as the information is included on the final drawings and project specifications. The design analysis shall be written in the present tense.

1.5.4 Design Analysis Calculations

The Design Analysis calculations shall include the basic information presented in the previous submittal, corrected to reflect changes in content made in response to review comments.

1.5.5 Common Deficiencies

Some repeated errors have occurred in the preparation of design documents in the past. Subsequently these errors have been identified and the Contractor directed to make corrections. The work involved in such corrections becomes lost effort and time for the designer. Some of these

errors which are most often overlooked include:

a. Not using correct abbreviations or terminology on the drawings. Abbreviations must match what is used on the standard abbreviation sheet and terminology must match what is used in the standard technical guide specifications.

b. Not using the correct scales, north arrow designation, section cut system, or incomplete dimensioning on the drawings.

c. Not providing sufficient space for door operation hardware at doors which swing into a wall running perpendicular to the opening. 4-inches minimum is required between edge of door frame and perpendicular walls.

d. Not providing correct and complete Design Analysis information written in the present tense. The Design Analysis will be written following the format indicated herein. A separate Fire Protection section in the Design Analysis with input from all disciplines is one area which is often overlooked and shall be included.

e. Not providing a structural stoop at exterior doors where the slab is at the same approximate elevation as the interior floor. The use of simple slabs on exterior grade leads to lifting of the slab in below-freezing temperatures which interferes with the safe operation of the door.

f. Not correctly presenting or coordinating (to avoid interference) features of Fire Protection, Noise Control, and Physical Security.

g. Not correctly referencing and cross referencing building sections, wall sections, details, etc.

h. Failure to read/use technical notes in editing the Technical Guide Specifications.

i. Failure to coordinate all disciplines prior to submittal of projects for review.

j. Improper use of fire-retardant wood. Fire-retardant wood is combustible; its use in buildings that are of noncombustible construction is extremely limited (see UBC for the minor allowable uses). Because of the potential for severe degradation, fire retardant plywood shall not be used in a roof or roofing system, or in structural applications.

k. Incorrectly listing trade names in door hardware specifications in lieu of ANSI numbers and failure to correctly specify hardware finishes.

l. Control joints in CMU walls and brick expansion joints in face brick are not shown on both architectural plans, elevations and structural plans, or are inconsistent. Note also control joint locating and coordination for floor tile per Tile Council of America recommendations.

m. Failure to delete all publications which do not apply to the particular project.

n. North is not oriented the same direction on all sheets (civil, site, arch).

1.6 INTERIORS

1.6.1 DESIGN ANALYSIS/NARRATIVE

Updates as a result of the 60% review conference shall be made to the design analysis.

1.6.2 TECHNICAL SPECIFICATIONS

Technical specifications shall be in final form for construction (in accordance with the requirements of Section 01332 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES and shall include all changes requested during the 60% review stage. All specifications shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product, installation requirements, and testing methods for this facility.

1.6.3 COLOR BOARDS AND LEGENDS

Color boards shall show actual color samples of all proposed exterior and interior finishes. A color board legend shall accompany the boards and shall clearly identify all finishes. Clarification of finish placement shall be required when more than one color of a single finish is proposed. Color boards shall be 8 1/2" x 11" in size and be provided in a three ring binder. Include project name and location, design stage and date on the front cover and spine of the binder.

1.6.4 FURNITURE Layout

Changes and updates required during the 60% review stage shall be incorporated into the furniture layout.

1.7 STRUCTURAL

1.7.1 DRAWINGS

Final drawings shall be complete, thoroughly checked, and fully coordinated with the other disciplines, specifications and all other construction documents. Previous comments and applicable criteria changes shall have been incorporated into the design. The drawings shall be complete with all plan views, elevations, sections, details, schedules, diagrams, and notes necessary for the construction of the project. For structural steel framing, the drawings shall meet the requirements for design drawings set forth in the AISC Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings. All structural steel members and connections shall be fully detailed. Design of structural steel connections shall be the responsibility of the structural design engineer and shall not be delegated to the steel fabricator. For structural concrete, the drawings shall conform to the standards for engineering (design) drawings set forth in the ACI Detailing Manual-1988 (SP-66). Additionally, those items described below which are applicable to the design shall be incorporated into the drawings. Drawings shall be at a scale appropriate for the design, in no case however, shall plan type drawings be done at a scale smaller than 1/4 inch = 1 foot or detail type drawings at scale smaller than 3/4 inch = 1 foot.

1.7.1.1 Grid Systems, Dimensions, and Floor Elevations

Each foundation and slab plan, floor framing plan and roof framing plan shall have an alpha-numeric grid system aligned with any columns or pilasters, or with load bearing and non-load bearing walls, as applicable. The same grid system shall be used for all plan views. Each plan view shown shall have all necessary dimensions. On plan views, the dimensions shall define the location of grid lines, offsets, and all structural elements, as well as the overall sizes of the structure. The finish elevation of the ground floor slab shall be indicated as 100'-0", and elevations for all other structural elements shall be numerically referenced to this basic elevation.

1.7.1.2 Plan Sheets

a. Foundation and Slab Plans

Foundation and slab plans shall show the size and location of all foundation elements, such as foundation walls and footings. Elevations for footings shall be indicated on the plan. Plans for slabs-on-grade and exterior stoop slabs at building entrances shall show location and type of joints, slab thicknesses and reinforcing, elevation of slab surfaces, and any other design features, such as equipment bases and areas of depressed slab surface, which affect the slab design. Also, plans shall note the placement of vapor barrier and capillary water barrier under the slab.

b. Roof and Floor Framing Plans

Roof framing plans shall be provided for all parts of the structure. Plans shall show the size, spacing, and location of all roof framing members, their supporting columns, pilasters or walls, all auxiliary members such as bracing and bridging, the orientation and extent of coverage of structural roof deck materials, and the size, location and framing of all major openings through the roof.

1.7.1.3 Elevation Views, Sections and Details Sheets

Elevation views, sections and details necessary to illustrate fully the design shall be provided. Some requirements peculiar to the various structural materials are described below.

a. Concrete

Include elevation views as necessary, plus sections and details to show the outlines of concrete cross-sections, reinforcing bar arrangements, concrete cover for rebar, installation of embedded items, and joint construction. All lap splice and embedment lengths for reinforcing bars shall be clearly indicated on the drawings. A sill detail for each foundation condition at exterior and interior doors shall be provided.

b. Masonry

Wall reinforcing shall be located and identified on plans, in section cuts, elevation views or in schedules. Structural elevations when needed shall be included to clarify the construction requirements for masonry reinforcement, especially the reinforcement around wall openings. Details applicable to the project shall be shown on the structural drawings. Listed below are some frequently required masonry details, most of which

are shown in TI 809-04, TM-5-809-3, and on the Typical Masonry Sheets. The Typical Masonry Sheets will be provided to the successful offeror upon request and may be edited and incorporated into the final drawings as needed. Additional details as required shall be extracted from other sources and incorporated into the final drawings. All details shall be fully edited to reflect the specific requirements of this project. Supplemental details shall be added as necessary to complete the design.

Masonry Details Frequently Used

- Masonry Control Joint (MCJ).
- Control Joint at Bond Beam.
- Bond Beam Corner Reinforcement.
- Seismic Reinforcement Around Wall Openings.
- Wall Reinforcement Details for l and/or 2 bar-per-cell stiffeners.
- Doweled or Other Connection of Masonry to Foundation, Floor, Roof or Bond Beam.
- Bond Beam (or Steel) Lintels and Bearing Details
- Lateral Support Detail for Top of Masonry Partition Walls. (Lateral support locations must be shown on framing plan sheets.)

c. Structural Steel, Steel Joists, and Steel Decking

Structural steel connections shall be fully detailed and shown on the drawings. The anchorage of beams, trusses, joists, and steel deck to walls or other bearings, and the extra framing or reinforcement required at deck openings shall also be detailed. Notes, details, or schedules on the drawings shall indicate the steel deck attachment method to be used, and shall give the size and spacing for perimeter, side lap, intermediate supports and end lap attachments. Welded connections shall be detailed using standard weld symbols illustrated in AWS D1.1. All applicable weld sizes, spacing, types, contours and finishes shall be shown.

1.7.1.4 Schedules

a. Foundation Schedules

Foundation schedules for footings shall be included, as applicable. The schedule shall include all pertinent information required for the foundation system being used.

b. Framing Schedules

For concrete framing, beam and column schedules shall conform to the requirements of the ACI Detailing Manual. For structural steel framing, provide a column schedule complete with column base plates and design loads at splices, if any, and at column bases.

1.7.1.5 Equipment Loads

All equipment loads which exceed 200 lbs and are not supported by concrete slab-on-grade shall be identified on the drawings by showing equipment location, total weight and reaction loads at support points.

1.7.1.6 Notes

a. Design Notes

Under the heading "Designer's Notes," the structural drawings shall contain

notes which begin: "The structural design was prepared using the following data:". The data then listed shall include the structural loading criteria used for design, such as roof and floor live loads, snow load design parameters, wind speed and wind load design parameters, seismic design parameters, allowable soil bearing pressures (as recommended by the Final Foundation Analysis report), foundation design depth, design wind uplift pressures for steel joists and other data pertinent to future building structural alterations. Also, to be listed are the ASTM designations and stress grades of the applicable structural materials: steel, masonry, concrete for each usage, reinforcing bars, welds, and bolts.

b. General Notes

Other notes, which direct the work to be performed, the materials to be used, etc., shall be grouped under the heading of "General Notes." Included in these notes should be a description of the building's structural system, if necessary.

1.7.2 SPECIFICATIONS

Technical specifications for final design shall be prepared in accordance with the instructions provided in Section 01332 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES, Paragraph 3.2 "Specifications". The technical specifications shall be complete and fully coordinated with the drawings. All specification indexes shall be completely edited to reflect the paragraphs retained in the body of the specification. All references that have not been used in the body of the specification shall be edited from the technical specification.

1.7.3 DESIGN ANALYSIS NARRATIVE

The final design analysis narrative shall repeat and expand upon the basic information presented in the 60% design analysis narrative, and shall be corrected to reflect revisions made for the final design.

1.7.4 DESIGN ANALYSIS CALCULATIONS

Calculations shall be prepared by an experienced structural engineer and shall include an investigation of loading, (gravity, wind, seismic, etc.) shear, moment, wind uplift, stability and deflection calculations. The computations are to be systematic and accurate. Similar beams, columns, panels, or connections may be grouped by designing the largest member or connection in the group, but every individual slab, beam, column, footing, connection or other structural member or structural consideration indicated by the plans shall be accounted for by pertinent calculations, statement or reasoning, or reference to source. Design formulas shall be written out in symbols the first time each is used, before the numerical values are supplied. All answers shall be identified by dimensional units. Basic assumptions of loads, working stresses, and methods of analysis must appear in the calculations; these assumptions must be applied consistently to a given problem. The calculations shall be presented in a clear and legible form, incorporating a title page, table of contents, and a tabulation showing all design loads and conditions. Pages shall be numbered consecutively and identified in the table of contents. Cross referencing shall be clear. The source of loading conditions, formulas, and references will be identified. Assumptions and conclusions will be explained. Superseded areas of computations must be ruled out. All computations shall be given a complete numerical and theoretical check within the Contractor's office. Calculation sheets shall carry the names

or initials of the developer and the checker, and the dates of calculations and checking. No portion of the design calculations shall be developed and checked by the same individual.

1.7.4.1 Computer Calculation Submittals

All applicable input and output data shall be included in readable printed form as part of the design calculations. Continuous paper such as that used in computer terminals or printers shall be cut into individual pages and shall not be submitted in a continuous roll form. All input and output data shall include a brief synopsis of the computer program(s) stating required input, method of solution, approximations used, codes and specifications used, output generated, extent of previous usage or certification of the program(s), and program author(s). Generalized flow chart(s) may be used to supplement description of solution process, if desired. All computer generated and long-hand calculation sheets shall be identified by sheet number, indexing and cross-referencing. Each member or structure being analyzed shall be identified, dimensioned and shown in a loading diagram. A separate diagram shall be provided for each load case, such as dead plus live, dead plus wind, etc. Input and output values including intermediate values shall clearly be identified if such values are necessary for evaluation of the submittal.

1.8 MECHANICAL

The 100 percent final design submittal shall include all the information presented in the 60 percent submittal, updated to final design status, corrected to reflect any changes made in response to review comments, and shall include the additional requirements specified hereinafter. Any concerns in developing the final design documents shall be resolved prior to starting the final design stage.

1.8.1 DESIGN DRAWINGS

The final design drawings shall be fully coordinated with the design analysis and specifications. Provide sufficient plans, piping diagrams and isometrics, mechanical room sections, water and air flow diagrams, details, schedules, control diagrams, sequences of operation, etc., as necessary to define the design requirements. Large-scale plans of congested areas shall be provided. Coordinate with architectural design for provision of access panels for all concealed valves, traps and air vents, etc. Floor plans shall use the architectural floor plans as a basis, with the building outline half-toned. The final design drawings shall include all the requirements and drawings defined for the 60 percent submittal. In addition, the following new drawing requirements and drawings shall be provided:

1.8.1.1 Mechanical Abbreviation, Legend, and General Notes Sheet

On this sheet, include any mechanical general installation notes that may be required to clarify the construction intent that may not be readily apparent in the specifications or on the drawings. General notes may be provided on a separate sheet if space does not exist on the Abbreviation and Legend sheet.

1.8.1.2 Plumbing Drawings

Enlarged Toilet Room Plans:

Enlarged toilet room plans showing all fixtures, water, waste, and vent piping shall be provided for each toilet area. Enlarged plans shall be drawn at a minimum 1:50 scale.

1.8.1.3 Mechanical HVAC Drawings

Hot Water System Flow Diagrams:

Provide a hot water flow diagrams showing the boiler, pumps, and all connected heating equipment including radiant floor heating systems. Each equipment item shall show associated flow rate. All thermometers, pressure gauges, isolation and control valves, bypass piping, etc. shall be shown on the flow diagram.

Chilled Water System Flow Diagrams:

Provide a chilled water flow diagrams showing the coolers, pumps, and all connected cooling equipment. Each equipment item shall show associated flow rates. All thermometers, pressure gauges, isolation and control valves, bypass piping, etc. shall be shown on the flow diagrams.

1.8.1.4 HVAC Control Drawings

In addition to the updated Controls Legend and System Block Diagram Sheets, final HVAC control drawings for each system and item of equipment shall be in accordance with the following requirements:

Control Diagrams:

Control Diagrams shall be provided for each system or item of equipment. Systems diagrams shall include every major component installed in or connected to the system, and only one system shall be shown on each diagram. Control Diagrams shall schematically show all sensors, controllers, actuators, indicators, and operator interface devices that are required for the complete automatic control and monitoring of the system. All sensing devices utilized in the control or instrumentation of the system, and all actuating devices shall be shown in their correct mechanical location and functionally interconnected to the other control devices which comprise the control loop. All controlling devices shall be shown with all functional interconnections to inputs and outputs. Each sensing, controlling, actuating, and indicating device shall have its own unique control loop tag identifier. Communication linkages required to complete the entire intended interface between operators and the control system shall be shown schematically. This includes interconnections between local temperature control panels and the base EMCS. All associated thermometers and pressure gauges, located in their correct mechanical locations, shall also be shown on the diagrams. See furnished Example HVAC Control Drawings for the required level of detail and formatting.

Sequence of Operations:

Sequence of Operations shall be provided for each item of equipment or system and shall fully describe the intended operation of the equipment or system in all different operating modes. As identified on the furnished Example Control Drawings, each Sequence shall be broken down by individual control loops and shall include descriptions of both normal operating modes (running, shutdown, standby, etc.) and abnormal, emergency or safety related modes. Sequences shall include a description of all indication instrumentation, alarm conditions, and automatic actions to be taken upon

occurrence of alarm conditions. Each device referenced in the sequence shall be referred to by its unique tag identifier, with each component designator shown in parenthesis. Design setpoints shall be specified for each control loop and indicated as being adjustable. See furnished Example HVAC Control Drawings for the required level of detail and formatting.

The designer shall analyze every component of each system and write each Sequence of Operation to compliment the Functional Performance Checklists. The Sequence of Control on the project drawings shall be explicit and written to ensure that all the requirements of the "Functional Performance Test Checklists" can be accomplished.

Control Points Lists:

Control points lists, identifying each temperature control system input and output, shall be developed for each temperature control panel. See furnished Example HVAC Control Drawings for the required level of detail and formatting.

1.8.2 TECHNICAL SPECIFICATIONS

The submitted 60 percent technical guide specifications shall be updated, completely edited, and fully coordinated with the drawings to accurately and clearly identify the final product and installation requirements for the facility.

1.8.3 DESIGN ANALYSIS NARRATIVE

The Final Design Analysis Narrative shall include the information presented in the 60 percent submittal, shall be corrected to reflect changes in content made in response to review comments, and shall be expanded to reflect the completed design.

1.8.4 DESIGN ANALYSIS CALCULATIONS

The Final Design Analysis calculations shall include all the information presented in the 60 percent submittal, shall be corrected to reflect changes in content made in response to review comments, and shall be expanded to reflect the completed design. In addition, the following new calculations shall be provided:

a. Pipe sizing calculations for the chilled & heating hot water, plumbing, gas piping systems.

b. Chilled & heating hot water pump head calculations.

c. Chilled & heating hot water expansion tank sizing.

d. External static pressure calculations for all fans.

e. Control Valve CV calculations.

f. Electrical/Communications room calculations

1.9 ELECTRICAL

1.9.1 Drawings

Drawing scale shall match architectural drawing requirements.

1.9.1.1 Interior Drawings

Drawings shall be complete and accurate in every detail and shall include arrangements and types of light fixtures, receptacles, switching, location of special features, necessary details, including legends, fixture schedule, panel schedules, one-line diagrams, layout or functional diagrams for each of the various systems, riser diagrams if applicable, estimated maximum demand for each panel and for entire building and any other relative information which will help clear up any and all questionable items on the plans or in the specifications toward the development of a set of plans which will be clear, concise and correct. Additional drawing requirements for specific equipment or systems have been included in subsequent paragraphs pertaining to the equipment or systems.

1.9.1.2 Floor Plans

All rooms must be identified by name and number. Plans must be legible. Plans shall be developed using the same scale and areas as the architectural floor plans. Separate floor plans must be provided for lighting, power, communications, and fire detection.

1.9.1.3 Diagrams

The power one-line diagram shall be on a dedicated sheet. The diagram should show ratings of major equipment including short circuit ratings. Power, communications diagrams, fire detection and telephone diagrams should be on separate sheets also.

1.9.1.4 Schedules

Provide panelboard and lighting fixture schedules. Panelboard schedules shall include the designation, location, mounting (flush or surface), number of phases and wires, voltage, ampacity and total connected and demand load. Indicate the trip rating, frame size, interrupting rating and number of poles for each circuit breaker in the panelboards. List the circuit number, circuit description and load for each branch circuit.

1.9.1.5 Exterior Drawings

Drawings shall be complete and accurate in all details and shall include the routing of all feeder and branch circuits.

1.9.2 Specifications

All specifications shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product, installation requirements, and testing methods for this facility.

1.9.3 Design Analysis Narrative

The text of the preliminary design analysis should be expanded to reflect the completed design. Calculations used to develop the design should be included. The document in its final form should conform in all applicable respects to the requirements of Section 01007 ELECTRICAL DESIGN REQUIREMENTS.

1.9.4 Design Analysis Calculations

Backup data shall be furnished to support basic design decisions related to sizing of major equipment and materials, selection of economic alternatives, performance of specific systems or equipment. Calculations may be performed by manual or computerized procedures. Use of standardized charts, curves, tables, graphs will generally be acceptable for portions of required calculations or in lieu of specific calculation procedures. Such data must be from a recognized source which is identified in the design analysis. If possible, a copy of applicable sheets or pages should be included with the calculations. For given equipment, the calculations must conform to requirements identified under subsequent paragraphs herein pertaining to the equipment.

1.9.4.1 Service

Sizing of building service.

1.9.4.2 Transformers

Sizing of all transformers. (Generally for dry type transformers, 1 or 2 samples of detailed calculations to identify the method are sufficient, if input data for remaining units can be derived from panel or feeder sizing data.)

Exterior Pad-mounted oil-filled transformers shall be sized based upon the following equation. KVA of the transformer selected shall be the standard commercial size, equal to or greater than the computed size. The equation shall be:

$$kVA = \frac{kW}{TF \times OF \times PF}$$

kVA = Minimum Transformer Capacity
kW = Estimated Maximum Demand (EMD) in kilowatts
TF = Temperature Correction Factor (i.e., + 30%= 1.30; -10% = .90).
OF = Short Time Overload Factor 1.24 (oil filled units only)(assuming maximum duration of 2 hours per 24 hour period).
PF = Power Factor

Temperature Correction Factor is calculated in the following manner. Temperatures are taken from AFM 88-8, Chapter 6 (TM 5-785) titled "Engineering Weather Data", dated 15 June 1978.
Summer Month Correction Factor: Temperature data is from Section A "Heating Design and Air Conditioning Design" (page 1), using the 1% Dry Bulb Temperature for A.C. criteria (1 percent dry bulb is the warmest average temperature during the warmest 4 months of the year). A 30 degree C equals 0% correction factor. Each degree C above 30 degree C is equal to -1.5% correction factor. Each degree C below 30 degree C is equal to +1.0% correction factor.
Winter Month Correction Factor: Temperature data is from Section C "Data for Calculating Energy Use for U.S. Sites" (page 1O5), by using "Heating Season Table", coldest month, minimum of two total observations and the highest temperature in the Temperature Range Column (5 percent temperature range dry bulb). A 30 degree C equals 0% correction factor. Each degree C below 30 degree C is equal to +1.0% correction factor.

In all cases, dry bulb temperatures were used in lieu of wet bulb readings, because the effects of humidity on a transformer appear to be negligible.

1.9.4.3 Feeders

Sizing of feeders (One detailed sample calculation is sufficient to establish the procedure, remaining data can be in schedules, tables, etc.).

1.9.4.4 Panelboards

Sizing and loading of panelboards and distribution equipment.

1.9.4.5 Voltage drop determination

Provide voltage drop calculations in accordance with IEEE 241 to demonstrate that the voltage drop recommendations of NFPA 70 are satisfied.

Calculations must be in accordance with the NEC and applicable IEEE guidelines. The following or equivalent formula should be used Vd=I(R cos Q + j sin. Interpolation and projection techniques may be used (i.e., a calculation for a 120 foot feeder to a 225A panel would not be necessary if a calculation for a 130 foot feeder to a 225A panel had already been performed). Calculations must be sufficient to encompass the application range of the project.

Distribution system design for voltages over 600 volts shall be based on a maximum of 2% voltage drop.

Distribution and branch circuit system design shall be based on a maximum of 5% voltage drop from the transformer to the utilization equipment. This shall be split such that there will be 3% or less voltage drop from the transformer (service drop, service entrance, etc.) to the branch circuit panelboard (proportioned most economically between the service and feeder conductors) and 2% voltage drop or more on branch circuits.

1.9.4.6 Illumination calculations

Data should identify target and calculated illumination levels for all rooms and areas. Calculations should be adjusted to compensate for special applications -- irregularly shaped rooms, open sides, ceiling obstructions (beams, ductwork), corridors, etc. If the lumen method is used for corridor calculations, the calculations should be performed using a module in which the length doesn't exceed 3 times the width (2:1 ratio preferred).

Computations shall be based on the simple lumen method using coefficients of utilization corresponding to 80 percent ceiling and 50 percent wall reflectance factors in office type applications (white suspended ceilings and light colored unobstructed walls). The floor coefficient of utilization factor shall be 20 percent for most areas with dark carpeting or tile. Lower levels shall be used such as 50 percent/30 percent factors for applications with CMU walls, dark colors, irregular surfaces and/or structural obstructions. A maintenance factor of 0.7 shall be used for the typical application (this value shall be adjusted for non-typical applications - 0.75 or 0.8 for a well maintained office or lab with a filtered air supply, 0.65 for a mechanical room with minimal maintenance).

1.9.4.7 Short Circuit Evaluation

Calculate the fault current in accordance with IEEE 242 for the electrical

distribution system. The maximum theoretical fault current levels shall be based on infinite bus conditions from the service entrance transformer. Actual fault current levels can be used for the pad-mounted switch rating. The extent of the analysis shall be the entire system unless the limitations given below are met. Comprehensive systems type calculations shall show maximum and minimum three phase, phase-to-phase, and phase-to-ground fault currents.

Extent of Analysis.

a. Low Fault-Levels. If the fault level (at the service transformer secondary) is 14000 A.I.C. or less for 480 V systems and 10,000 A.I.C. or less for 208 V systems, no additional documentation is necessary (assuming appropriate follow through in selection of equipment S.C. ratings).

b. High Fault-Levels. If the theoretical fault levels would exceed 50000 A.I.C., an extensive analysis shall be performed based on actual fault current levels available upstream of the service transformer. Computerized computations are preferred. The evaluation shall continue downstream until calculated fault levels are attenuated to 14000 A.I.C. or less for 480 V systems, 10,000 A.I.C. or less for 208 V systems.

1.9.4.8 Protective Coordination Analysis

A protective coordination study shall be performed to show that the power system is selectively coordinated and is fully coordinated with the upstream overcurrent devices. The protective coordination / short circuit study shall be complete and approved by the government before any changes are make to the existing equipment. The study as a minimum shall include the following:

a. Service entrance transformer protection to the pad-mounted switch fusing.
b. Main Service disconnect to the service entrance transformer protection.
c. Any main breaker downstream of the main service disconnect where this main breaker is part of a switchboard, switchgear or motor control center.
d. Any breaker downstream of the main service disconnect which has an overcurrent rating of 50% or larger of the main service disconnect rating.
e. Any protective device used to protect a standby or emergency generator or UPS shall be coordianted with the next device in the distribution system.
f. All ground fault relays shall be coordinated with the upstream device.
g. The primary and secondary protective devices for an interior transformer.
h. Any protective device connected ahead of the service entrance disconnect shall be coordinated with the upstream device.

1.9.4.9 Specialized Applications

Additional engineering backup should be included to address special requirements such as accommodation of nonlinear loads, harmonics analysis, energy studies, etc.

1.10 FIRE PROTECTION

1.10.1 DRAWINGS

Design will be an extension of the 60% submittal, incorporating all comments thereto and any revised criteria, all as specifically directed by the District Office. All conflicts, lack of specific criteria, and/or direction, inconsistencies, ambiguities, and lack of thorough understanding of the nature and scope of work shall be resolved prior to starting final

design work. The fire protection plans shall show the following: entire sprinkler system; fire detection system, to include control panels, remote annunciators, alarm notification devices, and each initiating device; fire walls; fire partitions; building separations; other fire protection features.

1.10.2 DESIGN ANALYSIS

The final design analysis will be an extension of the 60% design analysis and shall be complete for every item covered in the design and will include, but not be limited to, the following:

a. List of design criteria.

b. Design conditions.

c. Design calculations.

d. Complete description of system alarm zones.

e. Complete description of system sprinkler system.

f. Complete description of the building fire protection features.

g. Other pertinent information of value for future use in construction contract administration, substantiation of design methods, or permanent record shall be included.

1.10.3 TECHNICAL GUIDE SPECIFICATIONS

The following UFGS guide specifications shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product and installation requirements for the facility:

13930 WET-PIPE SPRINKLER SYSTEM, FIRE PRPTECTION
13935 DRY PIPE SPRINKLER SYSTEM, FIRE PROTECTION

All items identified in the specifications not required shall be marked for deletion in accordance with the requirements of Section 01332 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES. Those items of equipment, materials, or installation requirements that are required are not permitted to be modified or changed from that presently shown. Government approval is required for the final submittal of these guide specs.

1.11 ENVIRONMENTAL PROTECTION, COMPLIANCE, AND PERMITS

All environmental requirements that have been identified during the design process shall be include in the 100% Environmental Protection, Compliance, and Permits Design Analysis Chapter, the 100% Environmental Protection Plan, and/or Appendix to the Environmental Protection Plan.

1.11.1 Design Analysis Chapter

The Contractor shall update the chapter in the Design Analysis entitled: "ENVIRONMENTAL PROTECTION, COMPLIANCE, AND PERMITS". The updated chapter shall include additional summaries of environmental coordination, compliance, approvals, permits, and etc. required for the project. The

Contractor shall include additional documentations of the coordination, discussions, phone conversation records, and/or letters required to assure that the project is in full compliance with all Federal, State, Regional,and local environmental laws and regulations. The Contractor shall included an updated list of environmental permits, approvals, notifications, etc. that are required for the project.

1.11.2 Environmental Protection Plan

The Contractor shall update the 60% Draft Environmental Protection Plan to include all additional environmental requirements identified. The updated plan shall be submit for final review and acceptance.

1.11.3 Appendix to the Environmental Protection Plan

As an Appendix to the Final Environmental Protection Plan, the Contractor shall submit copies of the completed permit applications and associated documents, notices, reviews, and/or approvals that are required for the project. Copies of all permits and/or approvals required for the project shall be included along with any additional requirements and/or conditions of the permits which are required during and/or at completion of construction.

1.11.4 NPDES Storm Water Permit

If the project requires coverage under the General NPDES Permit for Storm Water Discharges from a Construction Site, the Contractor shall submit the following.

1.11.4.1 Notice of Intent (NOI)

Parts I and II of the Contractor's NOI shall be completed.

1.11.4.2 Notice of Termination (NOT)

Parts II and III of the NOT shall be completed.

1.11.4.3 Storm Water Pollution Prevention Plan (SWPPP)

Complete the Storm Water Pollution Prevention Plan. A SWPPP outline is available at ftp:\\155.77.239.151/pub/ae/SWPPP/SWPPP.DOC.

1.12 SUSTAINABLE DESIGN AND DEVELOPMENT REQUIREMENTS

Provide a list and cost of all sustainable design and development items and features actually incorporated into the design of this facility based on the SPiRiT Rating System.

PART 2 NOT USED

PART 3 NOT USED

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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.

AIR FORCE INSTRUCTION

AFI 32-1053	Pest Management Program

ARMY REGULATION

AR 200-5	Pest Management

CODE OF FEDERAL REGULATIONS (CFR)

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

US ARMY CORPS OF ENGINEERS TECHNICAL REPORT

WETLAND MANUAL	Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1

FORT CARSONS SPECIFIC REQUIREMENTS

SPCCP	Spill Prevention, Control and Counter-Measures Plan

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 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 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 comply with all applicable environmental Federal, State, and local laws and regulations. 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

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. All costs associated with this section shall be included in the contract price. The Contractor shall be responsible for payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations.

1.6 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the

site, the Contractor shall submit an Environmental Protection Plan for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but which the Contractor considers necessary, shall be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, the Contractor shall meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Contractor shall maintain a current version of the Environmental Protection Plan on site for review by interested parties.

1.6.1 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 approval, and implementing any additional requirements to be included in the Environmental Protection Plan.

1.6.2 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 Fort Carson's Spill Prevention, Control and Counter-Measures Plan SPCCP. 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 Fort Carson's Fire Department, the Contracting Officer, and Fort Carson's Directorate of Environmental Compliance and Management (DECAM)Office 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.

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.

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 surface discharge will be the method of disposal, a copy of the permit and associated documents shall be included as an attachment prior to discharging the waste water. 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, biological, and wetland resources plan that defines procedures for identifying and protecting the resources known to be on the project site and any resources discovered during construction. The plan 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 AR 200-5 Pest Management, Chapter 2, Section III "Pest Management Records and Reports" for data required to be reported to the Installation.

1.6.3 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.

1.7 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 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.

1.8 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.

1.9 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 ENVIRONMENTAL PERMITS, REVIEWS, APPROVALS, AND NOTIFICATIONS

This paragraph supplements the Contractor's responsibility under the contract clause "PERMITS AND RESPONSIBILITIES". The Contractor shall be responsible for obtaining all environmental construction permits, approvals, and/or submitting notifications required by Federal, State, Regional, and local environmental laws and regulations.

3.1.1 State of Colorado Fugitive Dust Permit

The Contractor shall be responsible for obtaining the State of Colorado Land Development (Fugitive Dust)permit prior to construction commencing. The State of Colorado may take a maximum of 60-days to review and issue the permit. The Contractor shall be responsible for completing, modifying any information to comply with the State of Colorado laws and regulations, and submitting the attached Air Pollutant Emission Notice(APEN)-and-Application for Construction permit including the Land Development-Fugitive Dust Control Plan, and the Notice of Start-up (which is required to be submitted 30 days prior to commencement of construction) along with the project's grading plan to the State of Colorado. The Contractor is responsible for payment of all fees associated with the permit.

3.1.2 EPA's National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharge Associated with Construction Sites

The Contractor and the Government shall be co-permittee's for EPA's National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharge Associated with Construction Sites on Federal Lands in the State of Colorado. **If** construction activities results in the disturbance of 5 acres of land or more, coverage under the EPA Storm Water General Permit For Construction Activities (Colorado Permit No. COR10*##F) is required. NOTE: This requirement changes from 5 acres to 1 acre effective 3 March 2003. See SECTION 01565 NPDES PERMITS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES.

3.1.3 Notification of Demolition and Renovation

The Contractor shall be responsible for coordinating and submitting the notification of demolition and renovation to the governing agency in accordance with all Federal, State, Regional, and local environmental laws and regulations.

3.2 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.

3.2.1 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. 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.

3.2.2 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.

3.2.3 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) as specified in Section 01356 STORM WATER POLLUTION PREVENTION MEASURES. BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. Any temporary measures shall be removed after the area has been stabilized.

3.2.4 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.

3.3 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.

3.3.1 Wetlands

The Contractor shall not enter, disturb, destroy, or allow discharge of contaminants into any wetlands.

3.4 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.

3.4.1 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. The Contractor shall comply with the attached Fugitive Dust Control Plan for Land Development and State of Colorado Fugitive Dust Permit.

3.4.2 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.

3.4.3 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 rules.

3.4.4 Burning

Burning shall be prohibited on the Government premises.

3.5 MANAGEMENT AND DISPOSAL OF WASTE AND CHEMICAL MATERIALS

Management and disposal of wastes and chemical materials shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.5.1 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.

3.5.2 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.

3.5.3 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. The Contractor shall, at a minimum, manage and store hazardous waste in compliance with 40 CFR 262. 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. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility. The disposition of Contractor generated hazardous waste and excess hazardous materials are the Contractor's responsibility.

3.5.4 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.

3.5.5 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 with and approved by the Contracting Officer. At the time of completion of the project, the water and residue left in the pond 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. Ground water encountered during construction activities shall be land applied on-site. Land application shall follow State of Colorado requirements for discharge although the State of Colorado does not have jurisdiction on Federal Facilities and no discharge permit will be necessary on Fort Carson. The Contractor shall discharge the water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, defined drainage areas, or discharge into the "waters of the State" shall occur.

c. Water generated from the flushing of lines after disinfection or disinfection in conjunction with hydrostatic testing shall be land applied according to above requirements for land application or shall be discharged into the sanitary sewer with prior approval from Fort Carson's Waste Water Treatment Plant Operator.

3.6 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor shall recycle acceptable cardboard and paper products through Fort Carson's Environmental Compliance Division, Office of Solid Waste, 719-526-5898. Fort Carson will deliver receptacles to the project site and will pick-up the receptacles on a regular schedule for the cardboard and paper products. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

3.7 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 Fort Carson's Directorate of Environmental Compliance and Management(DECAM) 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.

3.8 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 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 Contractor personnel or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.9 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.

3.10 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.

3.10.1 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.

3.10.2 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.

3.10.3 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.

3.10.4 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.

3.11 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.

3.12 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.

3.13 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.

3.14 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. The training and all additional meetings shall be document with the date, time, name of trainer, attendees of the training, and subjects covered. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. 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.

3.15 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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SPECIAL SAFETY REQUIREMENTS

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SECTION 01400

SPECIAL SAFETY REQUIREMENTS
05/00 Rev 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 basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996 and Changes) Safety and Health Requirements Manual

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

Demolish existing fire station. Contractor will follow SECTION 13286N - HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAING PCBS during demolition.

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 01330SUBMITTAL PROCEDURES:

Administrative Submittals

Accident Prevention Plan; G-AO

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. Fire Department access around the site and the building shall be maintained at all times.

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.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

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SECTION 01451A

CONTRACTOR QUALITY CONTROL
10/02; Omaha Revision 11/02

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 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	(2000b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

ENGINEERING REGULATIONS (ER)

ER 1110-1-12	(1 June 1993) Engineering and Design - Quality Management

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.

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 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 and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the 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, and shall be responsible for all construction and construction related activities at the site.

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. Design and 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 design and construction operations, both onsite and offsite, including work by subcontractors, designers of record, consultants, architect/engineers (AE), 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 superintendent.

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, designers of record, consultants, architect engineers (AE), 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 design and 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 Additional Requirements for Design Quality Control (DQC) Plan

The followng additional requirements apply to the Design Quality Control (DQC) plan:

(1) The Contractor's QCP Plan shall provide and maintain a Design Quality Control (DQC) Plan as an effective quality control program which will assure that all services required by this design-build contract are performed and provided in a manner that meets professional architectural and engineering quality standards. As a minimum, all documents shall be technically reviewed by competent, independent reviewers identified in the DQC Plan. The same element that produced the product shall not perform the independent technical review (ITR). In addition, the DQC Plan shall incorporate the Lessons Learned Databases provided by the Government. The Contractor shall correct errors and deficiencies in the design documents prior to submitting them to the Government.

(2) The Contractor shall include the design schedule in the master project schedule, showing the sequence of events involved in carrying out the project design tasks within the specific contract period. This should be at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. The schedule shall include review and correction periods associated with each item. This should be a forward planning as well as a project monitoring tool. The schedule reflects calendar days and not dates for each activity. If the schedule is changed, the Contractor shall submit a revised schedule reflecting the change within 7 calendar days. The Contractor shall include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal. These completed checklists shall be submitted at each design phase as part of the project documentation. Example checklists can be found in ER 1110-1-12.

(3) The DQC Plan shall be implemented by an Design Quality Control Manager who has the responsibility of being cognizant of and assuring that all documents on the project have been coordinated. This individual shall be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect. The Design Quality Control Manager shall be assigned as Design Quality Control Manager, but may have duties as Design Project Manager in addition to quality control. The Contractor shall notify the Contracting Officer, in writing, of the name of the individual, and the name of an alternate person assigned to the position.

The Contracting Officer will notify the Contractor in writing of the acceptance of the DQC Plan. After acceptance, any changes proposed by the Contractor are subject to the acceptance of the Contracting Officer.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of design and construction. Acceptance is conditional and will be predicated on satisfactory performance during the design and 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.

3.2.4 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 Postaward Conference, before start of design or 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, design activities, 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 Contractor 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, a Design Quality Control Manager, and sufficient number of additional

qualified personnel to ensure safety and contract compliance. The Safety and Health Manager shall receive direction and authority from the CQC System Manager and shall serve as a member of the CQC staff. 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, show 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 a graduate engineer, graduate architect, or a graduate of construction management, with a minimum of 2 years construction experience on construction similar to this contract or a construction person with a minimum of 5 years in related work experience. 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. A Design Quality Control Manager, who is a Registered Architect or Professional Engineer, shall be part of the Contractor's quality control staff. 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 15950A HEATING, VENTILATING AND AIR CONDITIONING (HVAC) CONTROL SYSTEMS; 15951A DIRECT DIGITAL CONTROL FOR HVAC; 15990A TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS; or 15995A 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.

For delivery by mail: Commander and Director
U.S. Army Engineer Waterways Experiment Station
Attn: CEWES-GS
3909 Hallsferry Road
Vicksburg, Mississippi 39180-6199

For other deliveries: Commander and Director
U.S. Army Engineer Waterways Experiment Station
Attn: CEWES-GS
3909 Hallsferry Road
Vicksburg, Mississippi 39180-6199

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 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.

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

-- End of Section --

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SECTION 01670

RECYCLED / RECOVERED MATERIALS

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 in the text by 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.

-- End of Section --

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MAIN FIRE STATION
PN: 12365
FORT CARSON, COLORADO

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ATTACHMENT NO. 1

FINAL FOUNDATION ANALYSIS
MAIN FIRE STATION
FORT CARSON, COLORADO

FINAL FOUNDATION ANALYSIS
RFP DESIGN, FIRE STATION
FORT CARSON, COLORADO

1. Scope

The results of the foundation investigation and analysis for the Fire Station at Fort Carson, Colorado are presented in this report. The scope of the study was to (1) evaluate the engineering properties of the subsoils; (2) provide allowable soil bearing pressures and (3) recommend types and depths of foundation elements and other measures pertinent to foundation design and construction.

2. Proposed Construction

This project involves the Request for Proposal design and construction of a new fire station with vehicle and equipment storage high bays, administration, sleeping and recreation areas, paved POV parking and driveways. The site is at the southwest corner of Wetzel Avenue and Prussman Boulevard in the cantonment area of Fort Carson.

3. Subsurface Investigations

3.1. General

The field investigation for the Fire Station was conducted on 4-5 November 2002 by an Omaha District drill crew, and consisted of six test borings numbered sequentially from FC02-1 through FC02-6. Borings were located and staked in the field by the Corps of Engineers Core Drill Crew by measuring distances from existing structures. Base personnel provided utility clearances with assistance from the Corps of Engineers Field Geologist. The borings were advanced with a Gus Pech 1300C truck-mounted soil-sampling rig using 4.375-inch inside diameter (I.D.) hollow stem augers with a 4.25-inch bullet bit and were all drilled to a depth of 20 feet. Holes were abandoned by filling with a high solids (30%) bentonite grout. After settlement of the grout the remaining depth of the holes was filled to the surface with soil.

TABLE 1: Summary of Borings

Boring Number	Date Drilled	Total Depth (ft)	Water During Drilling	Water 24-hours After Drilling
FC02-1	4-Nov-2002	20	Not Encountered	Not Encountered
FC02-2	4-Nov-2002	20	Not Encountered	Not Encountered
FC02-3	4-Nov-2002	20	Not Encountered	Not Encountered
FC02-4	4-Nov-2002	20	Not Encountered	Not Encountered
FC02-5	5-Nov-2002	20	Not Encountered	Not Encountered
FC02-6	5-Nov-2002	20	Not Encountered	Not Encountered

3.2. Standard Penetration Tests

Standard penetration tests were taken in all borings at depth intervals of 2.5 feet for the first 10 feet and every 5 feet for the remaining depth of the boring. The standard penetration samples were obtained in accordance with ASTM D 1586-99 "Penetration Test and Split-Barrel Sampling of Soils", using a 140-pound automatic trip hammer.

3.3. Disturbed Sampling

Representative disturbed samples of the subsoils were taken with a 2-inch outside diameter (O.D.) standard steel split spoon sampler using a 140-pound automatic SPT hammer, in accordance with ASTM D 1586-99. Samples were collected every 2.5 feet for the first 10 feet, then every 5 feet for the remaining depth of the hole. Samples were placed in a pint jar and the lid sealed airtight with at least three wraps of electrical tape. Each jar was labeled, denoting the hole and sample number, depth, date collected, and the project name. The jars were placed in wooden boxes that were subsequently labeled with the appropriate project information.

3.4. Undisturbed Sampling

Undisturbed samples were taken using 3-inch O.D. Shelby tubes. The Shelby tubes were hydraulically pushed a distance of 2 feet; the pressure exerted (pounds per square inch) and duration (seconds) of the 2-foot push were recorded on the field log. Undisturbed samples were taken at a depth of 5-7 and 10-12 feet in borings FC02-1, FC02-3 and FC02-5. Undisturbed Shelby tube samples were secured with packers and endcaps; endcaps were secured with at least five wraps of electrical tape. Shelby tubes were wiped clean and labeled on the outside with project, hole and depth information; in addition, a sample tag was completed and placed inside the tube prior to securing the endcaps. The tubes were placed inside foam-padded wooden boxes for shipment.

4. Laboratory Testing

Samples with transmittal sheets were shipped to the Omaha District Quality Assurance Facility for preparation, and were tested at the Terracon Inc. laboratory in Omaha, Nebraska. Tests were performed to determine visual classification, Atterberg Limits, grain size distribution, natural moisture content, sulfate ion content, soil pH, soil resistivity, as well as swell and consolidation characteristics. All tests were conducted in accordance with EM 1110-2-1906 "Laboratory Soils Testing".

Based upon the results of the testing program, the field logs were revised and supplemented as shown on the boring logs. These final logs represent an interpretation and compilation of the content of the field logs and the results of the laboratory tests of the field samples. The stratification lines shown on the boring logs represent the approximate boundaries between soil types and may be gradual. Boring logs are available from the Geotechnical Branch, Soils Section A, of the Omaha District.

5. Site Conditions

5.1. General Geology

Fort Carson is located on the western edge of the Colorado Piedmont section of the Great Plains Physiographic Province, a few miles east of the Front Range of the Rocky Mountains. The uplift and erosion of the Front Range produced numerous coalescing alluvial fans resulting in a high plain. This plain has since been acted upon by erosion, and presently is characterized by mesas capped by sand and gravel with relatively small stream valleys. The

topography of Ft. Carson exhibits moderate relief with the scattered mesas rising approximately 150 meters (500 feet) above the stream valleys. Drainage in the area is provided by tributaries of Fountain Creek. The alluvial deposits at the post are underlain by the Cretaceous age Pierre Shale, a compaction shale of marine origin.

5.2. Site-Specific Geology

The site is in a park and has a gentle slope toward the east. The overburden consists mainly of lean clay with sand and sandy lean clay (CL) underlain by interbedded layers of sandy silt (ML) and silty sand (SM). Bedrock and weathered bedrock were not penetrated. The soils encountered are atypical of those normally encountered at Fort Carson and likely represent uncontrolled fill.

5.3. Ground Water

Ground water was not encountered during drilling. The granular soils at depth should transmit water relatively quickly into open boreholes. The lack of saturated soil or cave-in 24 hours after drilling is a good indication that water is not located within 15 feet of the surface. Lenses of perched water are possible near the surface as a result of infiltration. When no shallow ground water table is identified, it is often located near the contact between overburden and bedrock.

5.4. Seismic Evaluation

Fort Carson has a spectral response acceleration for short periods (0.2 second) of 0.17g, and a 1.0 second spectral response of 0.06g. These values were derived using guidance from the U.S. Army Corps of Engineers Technical Instructions "Seismic Design for Buildings" TI 809-04, dated 31 December 1998, and the Federal Emergency Management Agency (FEMA) publication "NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures, 1997 Edition". Both accelerations were interpolated from 1:5,000,000 scale maps prepared by the U.S. Geologic Survey (USGS), Building Seismic Safety Council (BSSC), and FEMA for 0.2 Sec. Spectral Response Acceleration (5% of Critical Damping), Site Class B, and 1.0 Sec. Spectral Response Acceleration (5% Critical Damping), Site Class B, respectively. The spectral response accelerations taken from these maps must be adjusted for site class effects using coefficients provided in the aforementioned guidance. For design purposes, the reference site condition is taken as National Earthquake Hazards Reduction Program (NEHRP) site class D.

The adjusted maximum considered earthquake spectral response acceleration parameters are:

The Short-Period Spectral Acceleration ($S_{MS} = F_a S_s$) for site class D is (1.6 x 0.17) <u>0.272.</u>

The 1-Second Period Spectral Acceleration ($S_{M1} = F_v S_1$) for site class D is (2.4 x 0.06) <u>0.144.</u>

6. <u>Subsurface Recommendations</u>

6.1. General

Soils at the project site consist primarily of lean clay and sandy clay (CL) underlain by silty sand (SM) and sandy silt (ML). These soils are atypical of those normally encountered at Fort Carson and represent either uncontrolled fill or reworked alluvial deposits. The clay portion of the granular soil appeared to be derived from native clay, suggesting that the material originated from local soils. While the majority of the strata observed had moderate Standard Penetration Test blow counts, one interval of granular material displayed a resistance of 2 blows per foot, indicating a very loose state. In addition, consolidation testing indicates that the soils have a very high settlement potential under even relatively light loads. High plasticity clay was not encountered during the investigation, however is common at the installation and possible at this site. Clay with a liquid limit greater than 35 should not be used within five feet of the building perimeter. Additional restrictions on material used below footings and floor slabs are included below.

Prior to adding fill to the site, topsoil should be stripped and the subgrade soils scarified and recompacted. A slope of at least 1 percent and preferably 5 percent should be maintained within 10 feet of structures to ensure adequate drainage.

6.2. Foundation Options

6.2.1. Shallow Spread and Continuous Footings

The majority of structures at Fort Carson are founded on conventional spread and continuous footings bearing on a layer of replaced material to prevent differential movement due to expansive soil behavior. Drilled, cast-in-place concrete piers have been used in some areas where the expansive potential makes the required replacement depth impractical. While the soils tested possess a swell pressure of less than 1000 psf, they have a very high potential for consolidation under load.

The first foundation option is spread and continuous footings bearing on a layer of engineered material. A settlement analysis performed on three separate consolidation tests indicated that total settlement would not be reduced to acceptable levels, approximately 1-inch, unless 8 feet of material below the footings was replaced with suitable compacted engineered fill. With this thickness of engineered fill a bearing pressure of 1500 psf may be used.

Select fill under footings and floor slabs is to consist of material meeting the following criteria:

Select non-expansive fill should consist of natural sand and gravel, crushed rock, manufactured sand, or quarry fines. The material shall have a maximum particle size of 25 mm (1 inch) and a percent passing a No. 200 square mesh sieve of between 15 and 49 percent. The portion of material passing a No. 40 square mesh sieve shall either be non-plastic or shall have a plasticity index of less than or equal to 12.

The material is to be placed in lifts not exceeding 8 inches in loose thickness at a density of not less than 95 percent of maximum Modified density and a moisture content of between –2 and +2 percent of optimum. The 1500 psf bearing pressure value represents the maximum allowable bearing pressure at the base of the footings in excess of that due to surrounding overburden.

All exterior footings for heated structures should be founded a minimum of 3.5 feet below final exterior grade to provide adequate frost protection. All footings for unheated structures should be founded a minimum of 3.5 feet below final exterior grade to provide adequate frost protection.

6.2.2. Drilled Piers

The second option is drilled cast-in-place concrete piers. Pier design recommendations were beyond the scope of this investigation, specifically determining the depth to competent strata on which piers may bear. However, typical values for previously constructed projects are included herein, along with scope language for determining this depth and verifying that these design values are valid.

Piers are typically designed to bear in competent shale bedrock and rely on a combination of end and sidewall support. An end-bearing pressure of 20,000 psf, and a side friction value of 2000 psf for that portion greater than 10 feet below the surface is common. Piers should have a minimum diameter of 18 inches and be continuously reinforced to prevent tensional failure. Reinforcement members should have spacers or other centering devices to ensure that at least 2 inches of concrete covers them. Failure to provide this minimum cover may allow corrosion of the reinforcement and weakening of the pier. Piers should be completed as soon after drilling as possible; reinforcement and concrete should be placed the same day. Holes showing signs of caving in should be cased to create uniform diameters and prevent mushrooming near the surface. It is not recommended that slurry be used to keep the holes open due to the dry and potentially expansive nature of deeper site soils. The minimum pier spacing for clusters should be no less than three pier diameters.

Vitally important is the need to leave no loose soil at the base of the pier hole. As little as two inches of loose soil can prevent development of end-bearing pressure unless excessive vertical movement of the shaft takes place. Concrete must be placed via tremie to prevent segregation of aggregate during free fall and to lessen the possibility of leaving voids. The discharge point of the tremie should be maintained below the level of the concrete as it is being placed.

An accurate determination of the depth to competent bedrock must be made if this option is to be used. At least two locations, one near each end of the building footprint, should be drilled to a depth corresponding to two consecutive intervals of Standard Penetration Test (SPT) spoon refusal. This means that the shale is to be penetrated to where spoon refusal (greater than 50 blows per foot of penetration) is first encountered, then the boring is to be advanced an additional 5 feet where another SPT spoon interval is performed. If refusal is indicated at this second depth, the assumption is made that competent bedrock has been reached. If refusal is not indicated at this depth the boring is advanced another five feet and the procedure repeated. Note should also be made after removing the drill string whether there are strata subject to caving or that contain water. Ground water is often encountered near the contact with bedrock.

6.3. Slabs on Grade

Interior slabs for this structure must take into account any higher than normal area and point loads large vehicles will impose. Structural floors may be used, however the spans necessary for the equipment bays may be prohibitively expensive. If slab on grade floors are to be used a minimum of 4 feet of material is to be removed and replaced with the select material

described for footings whether conventional footings or drilled piers are used. The same placement criteria are to be followed. A vapor barrier overlying a six-inch capillary water barrier will be required beneath all floor slabs on grade. The barrier should consist of either a minimum 50-mil membrane or combination of a 20-mil membrane with an overlying 8-oz per square yard non-woven geotextile. A modulus of subgrade reaction "K" of 175 pci is recommended for this case (without frost penetration).

6.4. Pavement Design

Soil underlying pavement is predominantly sandy clay. This soil has a frost design classification of F3.

If rigid pavement design does not consider frost penetration, a modulus of subgrade reaction "K" of 125 pci is recommended for design purposes. Flexible pavement designs should use a California Bearing Ratio (CBR) value of 4 for subgrades compacted to 95 percent of maximum density per ASTM D 1557-78 when frost is not allowed to penetrate the subgrade. If frost penetration is considered in the design of rigid or flexible pavements, the design shall be in accordance with TM 5-818-2 "Pavement Design for Seasonal Frost Conditions".

6.5. Settlement

Based on an analysis conducted using consolidation test data from site samples and a simulated layer of dense engineered fill, total settlement should not exceed 1.0 inch under the recommended loading conditions if fill is placed as described in the Foundation Recommendations section. Differential settlement should not exceed 0.50 inch under such conditions.

6.6. Cementing Properties

Sulfate ion content tests were performed on representative samples from site borings. Test results indicated a sulfate ion content at less than 0.2 percent. Imported fill will be used against foundations under the first option, and manufactured material typically has very low sulfate content. Based on criteria outlined in ACI 201.2, a moderate exposure condition exists and sulfate-resistant cement will not be required for concrete in contact with soil or groundwater if this option is used.

The shale and weathered shale anticipated to underlie the site typically creates “severe” sulfate exposure conditions. Compounding the sulfate content problem are ground water “wicks” created by having the bottom end of piers in moist or saturated ground and the upper end in relatively dry soil. The flux between the two states drives sulfate-laden water through the semi-permeable concrete, and allows deposition of sulfate near the top when the moisture is removed. Because of this, sulfate-resistant concrete should be used for piers if that option is used.

Portland cement will be ASTM C 150:

A. Type V, or

B. Type II having a tricalcium aluminate content of less than 5 percent, or meeting the optional physical requirement for sulfate expansion for Type V cement on Table 4, ASTM C 150, or

C. Type II blended with a pozzolan meeting the requirements of ASTM C 618, Type F.

Due to the potential for alkali-aggregate reactivity within the boundaries of the Omaha District, cement meeting the optional chemical requirements for low alkali cement on Table 2, ASTM C 150 will also be specified for all concrete. The Resource Conservation Recovery Act (RCRA) mandates, where possible, all concrete specifications will also include the option to use pozzolan as a partial replacement for Portland cement.

6.7. Corrosion Potential

Soil resistivity tests were performed on representative samples of site soils. Test results indicated a resistivity of 615 and 2040 ohm-cm. In accordance with corrosion classifications in the Department of the Army TM 5-811-4 (17 March 1965), "Electrical Design, Corrosion Control", a "severe" corrosion potential is expected. Soil pH measured 7.8 and 8.2.

7. Construction Considerations

The uncontrolled fill at this site presents specific difficulties with respect to construction. The greatest is the need to ensure that all structures sensitive to settlement are placed on an adequate layer of engineered fill or a foundation system that extends into suitable strata. Either option presented above is believed to be suitable for this design. Which is chosen should be based on an economic analysis that takes into account not only the cost of materials and their installation, but also on the expected duration of construction and the ease with which the option can be implemented. While potentially less expensive from a materials standpoint, replacing large volumes of soil may require greater construction time and the potential for weather delays increases. These factors should be accounted for in the decision.

Ground water does not appear to be a problem for excavations reaching less than 15 feet based on the subsurface investigation. Some of the clay-rich soils present near the surface may be moisture sensitive and difficult to work if they become saturated.

ATTACHMENT NO. 2

REFERENCES

1. UNDER THE FOLDER LABELED “REFERENCES” ON THE CD-ROM ARE ADOBE ACROBAT COPIES OF SELECT AIR FORCE MANUALS (AFJMAN), UNIFIED FACILITIES CRITERIA (UFC) DOCUMENTS, AIR FORCE INSTRUCTIONS (AFI), TECHNICAL INSTRUCTIONS (TI), AIR FORCE HANDBOOKS (AFH), TECHNICAL MANUALS (TM), OMAHA DISTRICT DESIGN GUIDE (ODDG) CHAPTER AND ATTACHMENT, ENTRY CONTROL GATE DESIGN GUIDE (GATE), AND ENGINEERING MANUAL (EM). ALSO UNDER THE SAME FOLDER, ARE MS WORD 2000 COPIES OF THE FOLLOWING DOCUMENTS: STORM WATER POLLUTION PREVENTION PLAN (SWPPP) – SECTION 01565 ATTACHMENT, ADA ARCHTECTURAL DESIGN CHECKLIST LIST – SECTION 01336 ATTACHMENT AND FIRE CODE ANALYSIS – SECTION 01336 ATTACHMENT. THESE REFERENCES ARE REFERRED TO IN THIS RFP.

2. UNDER FOLDER LABELED “ETL” ON THE CD-ROM ARE ADOBE ACROBAT FILES OF VARIOUS ENGINEERING TECHNICAL LETTERS (ETL’S) REFERRED TO IN THIS RFP.

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ATTACHMENT NO. 3

AVAILABLE EDITED AND UNEDITED GUIDE SPECFICATIONS

ABBREVIATIONS

UFGS – UNEDITED UNIFIED FACILITIES GUIDE SPECIFICATIONS (FOR CONTRACTOR EDIT)
CEGS - 0MAHA – UNEDITED OMAHA DISTRICT CORPS OF ENGINEERS GUIDE SPECIFICATIONS, COPY INCLUDED AT END OF THIS INDEX. THERE MAY BE SOME PARTIAL EDITING ALREADY DONE.
RFP – EDITED RFP SECTIONS TO BE USED WITHOUT CHANGE

COPIES OF EACH OF THE SPECIFICATIONS SECTIONS (SPECSINTACT FORMAT) LISTED BELOW HAS BEEN PROVIDED ON THE SOLICITATION CD-ROM UNDER FOLDER LABELED “GUIDES”. SECTIONS ARE UFGS UNLESS LABELED OTHERWISE.

USE OF UFGS SECTIONS

Unless directed otherwise, use UFGS sections. Available UFGS sections include sections that have a 5 digit section number with either the letters "A" or "N" following the section number or no letter following the section number. The letters designate the specification proponent ("A" is for USACE and "N" is for NAVFAC). The Contractor shall use sections with the letter "A" following the section number or sections with no letter following the section number. Sections with the letter "N" following the section number shall not be used unless there is no other available section, the solicitation directs the use of these sections or the available sections do not meet the solicitation requirements. Where UFGS sections include tailoring options for both Army and Navy, use the Army tailoring option. Where conflicts exist that cannot be resolved, the Contracting Officer shall be contacted to resolve the issue.

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02160A 10/00 SOLIDIFICATION/STABILIZATION (S/S) OF CONTAMINATED MATERIAL
02180A 09/98 REMEDIATION OF CONTAMINATED SOILS AND SLUDGES BY INCINERATION
02181A 09/98 REMEDIATION OF CONTAMINATED SOILS BY THERMAL DESORPTION
02190A 12/02 BIOREMEDIATION OF SOILS USING LANDFARMING SYSTEMS
02191A 03/02 BIOREMEDIATION OF SOILS USING WINDROW COMPOSTING
02210A 10/95 SUBSURFACE DRILLING, SAMPLING, AND TESTING
02217A 12/92 FOUNDATION PREPARATION
02220 05/02 DEMOLITION
02226 11/97 REMOVAL AND SALVAGE OF HISTORIC BUILDING MATERIALS
02231 07/02 CLEARING AND GRUBBING
02233 07/02 CLEARING FOR CIVIL WORKS
02251A 09/95 FOUNDATION DRILLING AND GROUTING
02260A 09/98 SOIL-BENTONITE SLURRY TRENCH FOR HTRW PROJECTS
02261A 10/92 SOIL-BENTONITE SLURRY TRENCH CUTOFF
02300A 12/97 EARTHWORK
02301N 09/00 EARTHWORK FOR STRUCTURES AND PAVEMENTS
02302N 09/99 EXCAVATION, BACKFILLING, AND COMPACTING FOR UTILITIES
02315A 08/98 EXCAVATION, FILLING AND BACKFILLING FOR BUILDINGS
02315N 01/01 EXCAVATION AND FILL
02316A 05/02 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS
02318A 10/00 TEST FILL
02325N 09/99 DREDGING
02330A 08/94 EMBANKMENT FOR EARTH DAMS
02331A 08/99 LEVEE CONSTRUCTION
02332A 08/99 REINFORCED SOIL SLOPE
02361N 01/02 SOIL TREATMENT FOR SUBTERRANEAN TERMITE CONTROL
02362N 01/02 BASALTIC TERMITE BARRIER
02363N 09/01 TERMITE CONTROL BARRIER SYSTEM
02364A 06/98 TERMITICIDE TREATMENT MEASURES FOR SUBTERRANEAN TERMITE CONTROL
02370A 01/03 SOIL SURFACE EROSION CONTROL
02371A 09/02 WIRE MESH GABIONS [AND MATTRESSES]
02372A 10/01 WASTE CONTAINMENT GEOMEMBRANE
02373 09/01 GEOTEXTILE
02374A 01/03 GEOSYNTHETIC DRAINAGE LAYER
02375A 10/00 GEOGRID SOIL REINFORCEMENT
02376A 03/98 GEOSYNTHETIC CLAY LINER (GCL)
02377A 04/99 CLAY BARRIER LAYER
02378A 05/95 GEOTEXTILES USED AS FILTERS
02380A 10/01 STONE, CHANNEL, SHORELINE/COASTAL PROTECTION FOR STRUCTURES

02382 03/02 ARTICULATING CONCRETE BLOCK REVETMENTS
02390A 07/98 MOORING AND GROUNDING POINTS FOR AIRCRAFT
02395N 09/99 PRESTRESSED CONCRETE FENDER PILING
02396N 09/99 RESILIENT FOAM-FILLED MARINE FENDERS
02397N 09/99 ARCH-TYPE RUBBER MARINE FENDERS
02398N 09/99 PIER TIMBERWORK
02430A 07/95 TUNNEL AND SHAFT GROUTING
02441N 09/99 TRENCHLESS EXCAVATION USING MICROTUNNELING
02453A 10/01 PRESTRESSED CONCRETE PILING FOR CIVIL WORKS
02454A 02/98 PRECAST CONCRETE PILING
02455A 11/97 CAST-IN-PLACE CONCRETE PILES, STEEL CASING
02456A 02/98 STEEL H-PILES
02456N 02/02 PRESTRESSED CONCRETE PILES
02457A 02/98 ROUND TIMBER PILES
02457N 09/99 STEEL SHEET PILES
02458A 02/98 PRESTRESSED CONCRETE PILING
02458N 09/99 TIMBER PILES
02459A 02/98 PILING: COMPOSITE, WOOD AND CAST IN-PLACE CONCRETE
02459N 09/99 CAST-IN-PLACE CONCRETE PILES
02460N 09/99 STEEL H PILES
02461A 10/01 ROUND TIMBER PILES FOR HYDRAULIC STRUCTURES
02461N 09/99 WOOD MARINE PILES
02463A 10/01 STEEL H-PILES FOR CIVIL WORKS
02464A 05/92 METAL SHEET PILING
02465A 11/97 AUGER-PLACED GROUT PILES
02466A 12/97 DRILLED FOUNDATION CAISSONS (PIERS)
02466N 09/99 PRESSURE-INJECTED FOOTINGS
02467N 09/99 AUGER CAST GROUT PILES
02468N 09/99 DRILLED FOUNDATION CAISSONS
02490 12/01 SOIL AND ROCK ANCHORS
02510A 05/02 WATER DISTRIBUTION SYSTEM
02510N 09/00 WATER DISTRIBUTION
02521A 11/99 WATER WELLS
02521N 09/99 WATER SUPPLY WELL
02522A 05/98 GROUND-WATER MONITORING WELLS
02525A 09/01 RELIEF WELLS
02525N 09/99 [EXTRACTION] [MONITORING] WELLS
02531 07/02 SANITARY SEWERS
02532A 07/98 FORCE MAINS AND INVERTED SIPHONS; SEWER
02551N 08/01 NATURAL GAS DISTRIBUTION
02552A 02/02 PRE-ENGINEERED UNDERGROUND HEAT DISTRIBUTION SYSTEM
02552N 08/01 EXTERIOR SHALLOW TRENCH STEAM DISTRIBUTION
02553A 12/01 HEAT DISTRIBUTION SYSTEMS IN CONCRETE TRENCHES
02553N 08/01 EXTERIOR UNDERGROUND STEAM DISTRIBUTION SYSTEM
02554A 12/01 ABOVEGROUND HEAT DISTRIBUTION SYSTEM
02554N 08/01 EXTERIOR ABOVEGROUND STEAM DISTRIBUTION
02555A 12/01 PREFABRICATED UNDERGROUND HEATING/COOLING DISTRIBUTION SYSTEM
02555N 08/01 EXTERIOR FUEL DISTRIBUTION
02556A 12/02 GAS DISTRIBUTION SYSTEM (RFP)
02556N 02/01 EXTERIOR BURIED PUMPED CONDENSATE RETURN
02557N 09/99 EXTERIOR BURIED PREINSULATED WATER PIPING
02559N 08/01 VALVE MANHOLES AND PIPING AND EQUIPMENT IN VALVE MANHOLES
02560 (COLORADO) PAVEMENTS FOR SMALL PROJECTS (CEGS)
02570A 07/02 VALVE MANHOLES AND PIPING AND EQUIPMENT IN VALVE MANHOLES

02582N 09/99 ELECTRICAL MANHOLE AND HANDHOLE
02588N 09/99 CONCRETE POLES
02620A 09/01 SUBDRAINAGE SYSTEM
02621A 01/98 FOUNDATION DRAINAGE SYSTEM
02630A 03/00 STORM-DRAINAGE SYSTEM
02630N 09/99 STORM DRAINAGE
02661 09/99 POND AND RESERVOIR LINERS
02710A 12/97 BITUMINOUS-STABILIZED BASE COURSE, SUBBASE, OR SUBGRADE
02711A 03/98 PORTLAND CEMENT-STABILIZED BASE OR SUBBASE COURSE
02711N 09/99 BITUMINOUS CONCRETE BASE COURSE
02712A 12/97 LIME-STABILIZED BASE COURSE, SUBBASE, OR SUBGRADE
02712N 09/99 LEAN CONCRETE BASE COURSE
02713A 08/97 BITUMINOUS BASE COURSE
02713N 09/99 CEMENT STABILIZED [BASE] [SUBBASE] COURSE AT AIRFIELDS AND ROADS
02714A 07/01 DRAINAGE LAYER
02714N 09/99 LIME TREATED SUBGRADE [LIME MODIFIED SOILS]
02721A 03/97 SUBBASE COURSES
02721N 09/99 [BASE COURSE FOR RIGID] [AND SUBBASE COURSE FOR FLEXIBLE] PAVING
02722A 05/01 AGGREGATE AND/OR GRADED-CRUSHED AGGREGATE BASE COURSE
02722N 09/99 GRADED CRUSHED AGGREGATE BASE COURSE FOR FLEXIBLE PAVEMENT
02723N 09/99 SAND-CLAY [BASE] [SUBBASE] COURSE
02731A 01/98 AGGREGATE SURFACE COURSE
02741A 09/99 HOT-MIX ASPHALT (HMA) FOR ROADS
02741N 09/99 BITUMINOUS CONCRETE PAVEMENT
02742A 07/97 BITUMINOUS BINDER AND WEARING COURSES (CENTRAL-PLANT COLD-MIX)
02742N 09/99 HOT MIX BITUMINOUS PAVEMENT
02743N 09/99 BITUMINOUS PRIME COAT
02744A 07/97 BITUMINOUS ROAD-MIX SURFACE COURSE
02744N 09/99 BITUMINOUS TACK COAT
02745A 07/97 BITUMINOUS SURFACE TREATMENT
02746 02/97 RESIN MODIFIED PAVEMENT SURFACING MATERIAL
02747 01/98 POROUS FRICTION COURSE FOR AIRFIELDS AND ROADS
02748A 01/98 BITUMINOUS TACK AND PRIME COATS
02749 03/02 HOT-MIX ASPHALT (HMA) FOR AIRFIELDS
02751N 11/02 CONCRETE PAVEMENT FOR AIRFIELDS AND OTHER HEAVY DUTY PAVEMENTS
02752N 09/01 PORTLAND CEMENT CONCRETE PAVEMENT FOR ROADS AND SITE FACILITIES
02753A 01/02 CONCRETE PAVEMENT FOR AIRFIELDS AND OTHER HEAVY-DUTY PAVEMENTS
02754A 07/01 CONCRETE PAVEMENTS FOR SMALL PROJECTS
02755A 07/01 ROLLER COMPACTED CONCRETE (RCC) PAVEMENT
02760A 03/97 FIELD MOLDED SEALANTS FOR SEALING JOINTS IN RIGID PAVEMENTS
02761A 12/00 FUEL-RESISTANT (COAL TAR) SEALER
02761N 8/02 PAVEMENT MARKINGS
02762A 11/01 COMPRESSION JOINT SEALS FOR CONCRETE PAVEMENTS
02762N 09/99 JOINTS, REINFORCEMENT, AND MOORING EYES IN CONCRETE PAVEMENTS
02763A 04/01 PAVEMENT MARKINGS
02770A 03/98 CONCRETE SIDEWALKS AND CURBS AND GUTTERS
02780 01/98 CONCRETE BLOCK PAVEMENTS

02785A 07/97 BITUMINOUS SEAL COAT, SPRAY APPLICATION
02785N 09/99 BITUMINOUS SEAL COAT
02786N 09/99 FOG SEAL
02787 09/01 SLURRY SEAL
02787A 04/98 BITUMINOUS REJUVENATION
02788N 09/99 COAL TAR SEAL COAT WITH UNVULCANIZED RUBBER
02789N 09/99 BITUMINOUS SURFACE TREATMENT
02791 06/01 PLAYGROUND PROTECTIVE SURFACING
02811A 02/02 UNDERGROUND SPRINKLER SYSTEMS
02811N 08/01 IRRIGATION SPRINKLER SYSTEMS
02821A 02/02 FENCING
02821N 09/99 CHAIN LINK FENCES AND GATES
02832 08/99 SEGMENTAL CONCRETE BLOCK RETAINING WALL
02840A 02/02 ACTIVE VEHICLE BARRIERS
02841N 08/01 TRAFFIC BARRIERS
02870A 06/01 SITE FURNISHINGS
02870N 09/99 SITE AND STREET FURNISHINGS
02882 06/01 PLAYGROUND EQUIPMENT
02915A 01/02 TRANSPLANTING EXTERIOR PLANT MATERIAL
02921A 11/02 SEEDING
02921N 09/99 TURF
02922A 07/02 SODDING
02923A 01/02 SPRIGGING
02930A 01/02 EXTERIOR PLANTING
02930N 02/02 EXTERIOR PLANTS
02935A 01/02 EXTERIOR PLANT MATERIAL MAINTENANCE
02935N 09/99 LANDSCAPE MAINTENANCE
02951A 08/97 RUNWAY RUBBER REMOVAL
02961N 03/98 COLD-MILLING OF BITUMINOUS PAVEMENT
02964A 03/98 COLD MILLING OF BITUMINOUS PAVEMENTS
02965A 08/97 COLD-MIX RECYCLING
02966A 08/97 HOT IN-PLACE RECYCLING OF BITUMINOUS PAVEMENTS
02967A 04/01 HEATER SCARIFYING OF BITUMINOUS PAVEMENTS
02975A 07/97 SEALING OF CRACKS IN BITUMINOUS PAVEMENTS
02976N 09/99 STRESS-ABSORBING MEMBRANE INTERLAYER
02980A 08/97 PATCHING OF RIGID PAVEMENTS
02981A 11/97 GROOVING FOR AIRFIELD PAVEMENTS
02981N 09/99 RUBBER AND PAINT REMOVAL FROM AIRFIELD PAVEMENTS
02982N 09/99 RESEALING OF JOINTS IN RIGID PAVEMENT
02983N 09/99 PARTIAL DEPTH PATCHING OF RIGID PAVEMENT
02985A 12/97 SLABJACKING RIGID PAVEMENTS

DIVISION 03 - CONCRETE
(UFGS UNLESS DESIGNATED OTHERWISE)

03100A 05/98 STRUCTURAL CONCRETE FORMWORK
03101A 09/01 FORMWORK FOR CONCRETE
03150A 05/98 EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS
03151A 09/01 EXPANSION, CONTRACTION AND CONSTRUCTION JOINTS IN CONCRETE FOR CIVIL WORKS
03200A 09/97 CONCRETE REINFORCEMENT
03201 10/01 STEEL BARS AND WELDED WIRE FABRIC FOR CONCRETE REINFORCEMENT FOR CIVIL WORKS
03230 09/01 STEEL STRESSING TENDONS AND ACCESSORIES FOR PRESTRESSED CONCRETE

03300 11/01 CAST-IN-PLACE STRUCTURAL CONCRETE
03300N 02/02 CAST-IN-PLACE CONCRETE
03301A 09/01 CAST-IN-PLACE STRUCTURAL CONCRETE FOR CIVIL WORKS
03307A 11/01 CONCRETE FOR MINOR STRUCTURES
03311 09/99 MARINE CONCRETE
03330A 03/02 CAST-IN-PLACE ARCHITECTURAL CONCRETE
03340A 06/97 ROOF DECKING, CAST-IN-PLACE LOW DENSITY CONCRETE
03371 09/01 SHOTCRETE
03372 09/01 PREPLACED-AGGREGATE CONCRETE
03373 09/01 CONCRETE FOR CONCRETE CUTOFF WALLS
03410A 05/98 PRECAST/PRESTRESSED CONCRETE FLOOR AND ROOF UNITS
03410N 03/00 PLANT-PRECAST STRUCTURAL CONCRETE
03412N 09/99 PLANT-PRECAST PRESTRESSED STRUCTURAL CONCRETE
03413A 05/98 PRECAST ARCHITECTURAL CONCRETE
03414A 03/89 PRECAST ROOF DECKING
03415A 09/01 PRECAST-PRESTRESSED CONCRETE
03450 09/99 PLANT-PRECAST ARCHITECTURAL CONCRETE
03511A 09/96 GYPSUM PLANK DECKING (CONTRACTOR'S OPTION)
03520N 09/99 LIGHTWEIGHT CONCRETE ROOF INSULATION
03700 07/92 MASS CONCRETE
03701 10/01 ROLLER-COMPACTED CONCRETE FOR MASS CONCRETE CONSTRUCTION
03900 12/97 RESTORATION OF CONCRETE IN HISTORIC STRUCTURES
03930 09/99 CONCRETE REHABILITATION

DIVISION 04 - MASONRY
(UFGS UNLESS DESIGNATED OTHERWISE)

04200 08/02 MASONRY
04215 08/02 GLAZED STRUCTURAL CLAY TILE AND PREFACED CONCRETE MASONRY UNITS
04270 08/02 GLASS MASONRY UNITS
04810 08/02 NONBEARING MASONRY VENEER/STEEL STUD WALLS
04900 05/97 RESTORATION AND CLEANING OF MASONRY IN HISTORIC STRUCTURES

DIVISION 05 - METALS
(UFGS UNLESS DESIGNATED OTHERWISE)

05055A 12/92 METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS
05090A 09/98 WELDING, STRUCTURAL
05091A 09/98 ULTRASONIC INSPECTION OF WELDMENTS
05092A 09/98 ULTRASONIC INSPECTION OF PLATES
05093A 09/98 WELDING PRESSURE PIPING
05120 07/02 STRUCTURAL STEEL
05210A 01/02 STEEL JOISTS
05210N 09/00 STEEL JOISTS [AND JOIST GIRDERS]
05300A 01/02 STEEL DECKING
05310N 09/99 STEEL DECKS
05400A 01/02 COLD-FORMED STEEL FRAMING
05400N 09/99 COLD-FORMED METAL FRAMING
05500A 01/02 MISCELLANEOUS METAL
05500N 05/02 METAL FABRICATIONS
05502A 05/92 METALS: MISCELLANEOUS, STANDARD ARTICLES, SHOP FABRICATED ITEMS
05615A 04/93 STOPLOGS

05650A 11/02 RAILROADS
05650N 08/01 RAILROAD TRACK AND ACCESSORIES
05652N 09/99 WELDING CRANE AND RAILROAD RAIL - THERMITE METHOD

DIVISION 06 - WOODS & PLASTICS
(UFGS UNLESS DESIGNATED OTHERWISE)

06100A 02/02 ROUGH CARPENTRY
06100N 09/99 ROUGH CARPENTRY
06200A 11/01 FINISH CARPENTRY
06200N 09/99 FINISH CARPENTRY
06410A 11/01 LAMINATE CLAD ARCHITECTURAL CASEWORK
06650 10/00 SOLID POLYMER (SOLID SURFACING) FABRICATIONS
06650N 09/99 SOLID POLYMER FABRICATIONS

DIVISION 07 - THERMAL & MOISTURE PROTECTION
(UFGS UNLESS DESIGNATED OTHERWISE)

07110A 09/98 BITUMINOUS DAMPPROOFING
07112N 09/99 BITUMINOUS DAMPPROOFING
07121N 09/99 BUILT-UP BITUMINOUS WATERPROOFING
07131 03/02 ELASTOMERIC SHEET WATERPROOFING
07132A 09/98 BITUMINOUS WATERPROOFING
07132N 09/01 ELASTOMERIC SHEET WATERPROOFING
07141N 09/99 FLUID-APPLIED WATERPROOFING
07161N 09/99 METALLIC OXIDE WATERPROOFING
07170N 09/99 BENTONITE WATERPROOFING
07190N 09/99 WATER REPELLENTS
07212N 09/99 MINERAL FIBER BLANKET INSULATION
07214N 09/99 BOARD AND BLOCK INSULATION
07216N 09/00 LOOSE FILL THERMAL INSULATION
07220A 10/01 ROOF INSULATION
07220N 03/00 ROOF AND DECK INSULATION
07240 10/01 EXTERIOR INSULATION AND FINISH SYSTEMS
07310 02/95 SLATE ROOFING
07311A 08/98 ROOFING, STRIP SHINGLES
07311N 09/99 ASPHALT SHINGLES
07320A 07/02 CLAY TILE ROOFING
07320N 09/99 ROOF TILES
07410N 09/99 METAL ROOF AND WALL PANELS
07412A 10/01 NON-STRUCTURAL METAL ROOFING
07413A 10/01 METAL SIDING
07416A 11/01 STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM
07510A 10/01 BUILT-UP ROOFING
07511N 09/99 BUILT-UP ASPHALT ROOFING (AGGREGATE SURFACED)
07512N 09/99 BUILT-UP ASPHALT ROOFING (SMOOTH SURFACED)
07513N 09/99 BUILT-UP ASPHALT ROOFING (MINERAL SURFACED)
07515A 01/02 PROTECTED MEMBRANE ROOFING (PMR)
07530A 09/95 ELASTOMERIC ROOFING (EPDM)
07531N 09/99 CHLOROSULFONATED POLYETHYLENE ROOFING (CSPE)
07532N 09/99 POLYISOBUTYLENE (PIB) ROOFING
07536N 09/99 ETHYLENE PROPYLENE DIENE MONOMER (EPDM) ROOFING
07541N 09/99 POLYVINYL CHLORIDE (PVC) ROOFING
07542N 09/99 THERMOPLASTIC ALLOY (TPA) ROOFING

07548A 08/97 POLYVINYL CHLORIDE (PVC) ROOFING
07550N 09/99 MODIFIED BITUMINOUS MEMBRANE ROOFING
07551A 01/02 MODIFIED BITUMEN ROOFING
07570A 11/01 SPRAYED POLYURETHANE FOAM (SPF) ROOFING
07571N 09/99 FOAMED ROOFING
07572N 09/99 COATINGS FOR FOAMED ROOFING
07580N 09/99 ROLL ROOFING
07600A 11/01 SHEET METALWORK, GENERAL
07600N 09/99 FLASHING AND SHEET METAL
07610 08/94 COPPER ROOF SYSTEM
07611N 09/99 STEEL STANDING SEAM ROOFING
07612N 09/99 ALUMINUM STANDING SEAM ROOFING
07620A 08/99 MESH TERMITE BARRIER
07625A 05/01 COPPER SHEET METAL FLASHING
07720A 04/00 ROOF VENTILATORS, GRAVITY-TYPE
07810 08/02 SPRAY-APPLIED FIREPROOFING
07840A 08/00 FIRESTOPPING
07840N 09/99 FIRESTOPPING
07900A 06/97 JOINT SEALING
07920N 09/99 JOINT SEALANTS

DIVISION 08 - DOORS & WINDOWS
(UFGS UNLESS DESIGNATED OTHERWISE)

08110 05/01 STEEL DOORS AND FRAMES
08120 09/99 ALUMINUM DOORS AND FRAMES
08161 08/01 ALUMINUM SLIDING GLASS DOORS
08162 08/01 SLIDING FIRE DOORS
08165A 11/01 SLIDING METAL DOORS
08181 08/01 METAL STORM DOORS
08210 09/99 WOOD DOORS
08302N 08/01 CORROSION CONTROL HANGAR DOORS
08315N 09/01 BLAST RESISTANT DOORS (OVAL ARCH MAGAZINES)
08330A 09/02 OVERHEAD ROLLING DOORS
08331A 09/98 METAL ROLLING COUNTER DOORS
08331N 08/01 ROLLING SERVICE [AND FIRE] DOORS
08342 08/02 STEEL SLIDING HANGAR DOORS
08361 08/01 SECTIONAL OVERHEAD DOORS
08370 08/01 VERTICAL LIFT DOORS
08390 04/01 BLAST RESISTANT DOORS
08510 08/01 STEEL WINDOWS
08520A 03/00 ALUMINUM AND ENVIRONMENTAL CONTROL ALUMINUM WINDOWS
08520N 08/01 ALUMINUM WINDOWS
08550 08/01 WOOD WINDOWS
08560 08/01 PLASTIC WINDOWS
08581 08/01 BLAST RESISTANT TEMPERED GLASS WINDOWS
08582 08/01 ALUMINUM STORM WINDOWS
08590 08/97 WOOD WINDOWS - REPAIR AND REHABILITATION
08600 08/00 SKYLIGHTS
08710 02/02 DOOR HARDWARE
08745 08/01 ELECTRICAL LOCKING CONTROL FOR BRIGS
08800N 09/99 GLAZING
08810A 05/97 GLASS AND GLAZING
08840A 07/95 PLASTIC GLAZING
08850 07/92 FRAGMENT RETENTION FILM FOR GLASS

08900 09/99 GLAZED CURTAIN WALL

DIVISION 09 - FINISHES
(UFGS UNLESS DESIGNATED OTHERWISE)

09100N 09/99 METAL SUPPORT ASSEMBLIES
09200A 06/97 LATHING AND PLASTERING
09205N 09/99 FURRING AND LATHING
09212N 09/00 GYPSUM PLASTER, CEMENT PLASTER, AND STUCCO
09215A 11/95 VENEER PLASTER
09215N 09/99 VENEER PLASTER
09225A 11/95 STUCCO
09250 11/01 GYPSUM BOARD
09310 8/02 CERAMIC TILE, QUARRY TILE, AND PAVER TILE
09330 08/02 CHEMICAL-RESISTANT QUARRY TILE
09410 06/02 PORTLAND CEMENT TERRAZZO
09421A 11/95 TERRAZZO TILE
09445A 01/96 RESINOUS TERRAZZO FLOORING
09510 07/02 ACOUSTICAL CEILINGS
09611N 03/01 THIN FILM FLOORING SYSTEM FOR AIRCRAFT MAINTENANCE FACILITIES
09612N 03/01 EPOXY MORTAR FLOORING SYSTEM FOR AIRCRAFT MAINTENANCE FACILITIES
09620A 01/98 RESILIENT ATHLETIC FLOORING
09640A 11/01 WOOD STRIP FLOORING
09641N 08/01 WOOD ATHLETIC FLOORING
09643N 08/01 PORTABLE (DEMOUNTABLE) WOOD FLOORING
09645 07/02 WOOD PARQUET FLOORING
09650 08/02 RESILIENT FLOORING
09660 08/02 CONDUCTIVE VINYL FLOORING
09670 08/02 FLUID-APPLIED FLOORING
09680A 08/02 CARPET
09680N 08/01 CARPET
09685N 08/01 CARPET TILE
09720 07/02 WALLCOVERINGS
09840A 11/01 ACOUSTICAL WALL TREATMENT
09900 02/02 PAINTS AND COATINGS
09910N 03/00 MAINTENANCE, REPAIR, AND COATING OF TALL ANTENNA TOWERS
09915 08/02 COLOR SCHEDULE
09963N 09/99 HIGH-BUILD GLAZE COATINGS
09965A 12/02 PAINTING: HYDRAULIC STRUCTURES
09965N 08/01 METALLIC TYPE CONDUCTIVE/SPARK RESISTANT CONCRETE FLOOR FINISH
09967N 09/99 COATING OF STEEL WATERFRONT STRUCTURES
09970N 09/01 INTERIOR COATING OF WELDED STEEL PETROLEUM FUEL TANKS
09971 09/01 EXTERIOR COATING OF STEEL STRUCTURES
09971A 10/00 METALLIZING: HYDRAULIC STRUCTURES
09972 09/01 INTERIOR COATING OF WELDED STEEL WATER TANKS
09973 09/01 INTERIOR COATING OF WELDED STEEL PETROLEUM FUEL TANKS
09974N 09/00 PROTECTION OF BURIED STEEL PIPING AND STEEL BULKHEAD TIE RODS
09980N 09/99 INTERIOR LINING FOR CONCRETE STORAGE TANKS (FOR PETROLEUM FUELS)

09981N 09/98 LINSEED OIL PROTECTION OF CONCRETE SURFACES
09995 01/98 PREPARATION OF HISTORIC WOOD AND METAL SURFACES FOR PAINTING

DIVISION 10 - SPECIALTIES
(UFGS UNLESS DESIGNATED OTHERWISE)

10100A 07/02 VISUAL COMMUNICATIONS SPECIALTIES
10153 08/02 TOILET PARTITIONS
10191N 08/01 CUBICLE TRACK AND HARDWARE
10201N 09/99 METAL [WALL] [AND] [DOOR] LOUVERS
10260 07/02 WALL AND CORNER GUARDS
10270A 01/97 RAISED FLOOR SYSTEM
10270N 09/99 ACCESS FLOORING
10430 07/02 EXTERIOR SIGNAGE
10440 07/02 INTERIOR SIGNAGE
10505N 09/99 STEEL CLOTHING LOCKERS
10605N 09/99 WIRE MESH PARTITIONS
10615A 08/00 DEMOUNTABLE PARTITIONS
10650A 08/00 OPERABLE PARTITIONS
10652N 08/01 OPERABLE PANEL PARTITIONS
10655N 08/01 ACCORDION FOLDING PARTITIONS
10675N 09/99 STEEL SHELVING
10716N 08/01 STORM SHUTTERS
10800 07/02 TOILET ACCESSORIES

DIVISION 11 - EQUIPMENT
(UFGS UNLESS DESIGNATED OTHERWISE)

11020 08/02 SECURITY VAULT DOOR
11022A 12/88 DOORS; FIRE-INSULATED, RECORD-VAULT
11025 08/01 FORCED ENTRY RESISTANT COMPONENTS
11035 04/00 BULLET-RESISTANT COMPONENTS
11145A 04/01 AVIATION FUELING SYSTEMS
11161N 09/99 DOCK LEVELERS
11162A 08/00 LOADING DOCK LEVELER
11171N 08/01 PACKAGED INCINERATORS
11181A 02/90 INCINERATORS, GENERAL PURPOSE
11182A 08/01 INCINERATORS, MEDICAL WASTE
11191 09/99 DETENTION AND SECURITY WINDOWS
11192 09/99 DETENTION AND SECURITY GLAZING
11193 09/99 DETENTION HOLLOW METAL FRAMES, DOORS, AND DOOR FRAMES
11194 08/01 DETENTION HARDWARE
11195 09/99 DETENTION FURNITURE AND ACCESSORIES
11211A 12/88 PUMPS: WATER, CENTRIFUGAL
11212A 03/89 PUMPS: WATER, VERTICAL TURBINE
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14601A 04/94 CRANES, BRIDGE & GANTRY, TOP RUNNING, 30-TON MAXIMUM CAPACITY
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STORM WATER POLLUTION PREVENTION MEASURES

11/01

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SECTION 01356

STORM WATER POLLUTION PREVENTION MEASURES
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 SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 448	(1998) Sizes of Aggregate for Road and Bridge Construction
ASTM D 4873	(2001) Identification, Storage, and Handling of Geosynthetic Rolls and Samples

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 288	(2000) Geotextile for Highway Applications

1.2 GENERAL

The Contractor shall implement the storm water pollution prevention measures specified in this section in a manner which will meet the requirements of Section 01355 ENVIRONMENTAL PROTECTION, and the requirements of the National Pollution Discharge Elimination System (NPDES) permit specified in Section 01556 NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not haveing 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

Mill Certificate or Affidavit

1.4 EROSION AND SEDIMENT CONTROLS

The controls and measures required by the Contractor are described in the Storm Water Pollution Prevention Plans (SWPPP) attached to Section 01556 NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES.

PART 2 PRODUCTS

2.1 COMPONENTS FOR SILT FENCES

2.1.1 Geotextile

The geotextile shall comply with the requirements of AASHTO M 288 for temporary silt fence.

2.1.2 Silt Fence Stakes and Posts

The Contractor may use either wooden stakes or steel posts for fence construction. Wooden stakes utilized for silt fence construction, shall have a minimum cross section of 2 inches by 2 inches when oak is used and 4 inches by 4 inches when pine is used, and shall have a minimum length of 3 feet. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 5 feet.

2.1.3 Mill Certificate or Affidavit

A mill certificate or affidavit shall be provided attesting that the geotextile and factory seams meet chemical, physical, and manufacturing requirements specified above. The mill certificate or affidavit shall specify the actual Minimum Average Roll Values and shall identify the fabric supplied by roll identification numbers. The Contractor shall submit a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the geotextile.

2.1.4 Identification Storage and Handling

Geotextile shall be identified, stored and handled in accordance with ASTM D 4873.

2.1.5 Support Mesh

Support mesh shall be 14-1/2 gage or heavier steel wire with a mesh spacing of 6 by 6 inch or a prefabricated polymeric mesh of equivalent strength.

2.2 Erosion Control Blankets

Erosion control blankets shall be a machine-produced mat with a biodegradable agricultural straw matrix (approximately 0.50 lb/sq yd) and photodegradable netting on each side. The blanket shall be sewn together with degradable thread. Installation staple patterns shall be clearly marked on the erosion control blanket with environmentally safe paint.

2.3 COMPONENTS FOR SEDIMENT TRAP

Coarse aggregate shall conform to ASTM D 448, Size 3, 357, or 5. Minor variations from the gradations specified will be permitted. Stone for riprap shall consist of field stone or rough unhewn quarry stone of approximately rectangular shape. The stone shall be hard and angular and of such quality that it will not disintegrate on exposure to water or weathering. The specific gravity of individual stones shall be at least 2.5. Riprap stones shall weigh between 50 and 150 pounds each, except that approximately 10 percent may weigh 50 pounds or less. At least 60 percent shall weight more than 100 pounds. Geotextile shall conform to paragraph GEOTEXTILES.

2.4 COMPONENTS FOR INLET PROTECTION

Aggregates for gravel filter should be sized to get the greatest amount of filtering action possible (by using smaller-sized stone), while not creating significant ponding problems.

2.5 STONE CONSTRUCTION ENTRANCE

Aggregate for construction entrance shall conform to ASTM D 448, Size 1. Minor variations from the gradation specified will be permitted. Geotextile shall conform to paragraph GEOTEXTILES.

2.6 ROCK CHECK DAMS

Coarse aggregate shall conform to ASTM D 448 size number 1 or approved equal. Riprap shall consist of field stone or rough unhewn quarry stone of approximately rectangular shape. Riprap shall be hard and angular. The specific gravity of individual stones shall be at least 2.5. Concrete rubble may be used provided it has a density of at least 150 pcf. Individual stones shall have a weight of 50 to 150 lbs except that a maximum of 10 percent of stone may weigh less than 50 lbs. At least 60 percent of stones shall weigh more than 100 lbs.

2.7 GEOTEXTILES

Geotextile for other than silt fence shall comply with the requirements of AASHTO M 288 for a separation geotextile.

PART 3 EXECUTION

3.1 INSTALLATION OF SILT FENCES

Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at a support post, with a minimum 6 inch overlap, and securely sealed. A trench shall be excavated approximately 6 inches wide and 8 inches deep on the upslope side of the location of the silt fence. The 6-inch by 8-inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the Contracting Officer.

3.2 Sediment Trap

The area under the embankment shall be cleared, grubbed, and stripped of any vegetation and root mat. Fill material for the embankment shall be placed in accordance with Section 02300 EARTHWORK. A geotextile shall be placed between the riprap and subgrade.

3.3 Stone Construction Entrance

The area of the entrance shall be cleared of all vegatation, roots, and other objectionable material. The aggregate layer shall have a minimum total thickness of 6 inches. A geotextile shall be placed beneath aggregate for the full width and length of the entrance. A minimum of 3 inches of the aggregate shall be placed in a cut section to provide stability and secure the geotextile. If conditions on the site are such that the majority of the mud is not removed by the vehicles traveling over the stone, then the tires of the vehicles shall be washed before entering

the road. Wash water must be carried away from the entrance to an approved settling area to remove sediment. A wash rack may also be installed for washing of vehicles.

3.4 MAINTENANCE

The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. Maintenance of protective measures shall conform to the requirements in the SWPPP.

3.5 INSPECTIONS

3.5.1 General

The Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and area where vehicles exit the site at least once every seven (7) calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Where sites have been finally stabilized, such inspection shall be conducted at least once every month. Inspection of protective measures shall conform to the requirements in the SWPPP.

-- End of Section --

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SECTION 01565

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03/01

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SECTION 01565

(FEDERAL FACILITIES COLORADO) NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES

03/01

Attachments: Endangered Species/Critical Habitat Letter of Determination
Storm Water General Permit For Construction Activities
Notice of Intent
Notice of Termination

PART 1 GENERAL

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. COR10*##F) 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 Government shall be responsible for all submissions to the EPA. The Government 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 complete and sign a Notice of Intent (NOI) in accordance with NPDES Permit No. COR10*##F. The Contractor's NOI shall be furnished to the Contracting Officer at least 7 calender days prior to the commencement of construction activities. The Government shall submit the Contractor's and Government's NOI's to the EPA. The Government will not submit the NOI's 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. The Status of Owner/Operator shall be "F" for both the Contractor and the Government. The Contractor shall check the box marked (d) concerning eligibility with regard to protection of endangered species.

3.2.2 Storm Water Pollution Prevention Plan

3.2.2.1 General

The Contractor shall be responsible for preparing the Storm Water Pollution Prevention Plan (SWPPP). 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 Government 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 indicate the NPDES permit number, name and telephone number of a local contact person, and a brief description of the project near the main entrance of the construction site in accordance with Part IV.B.2 of the general permit.

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 furnished to the Contracting Officer for attachment to the SWPPP no more than 2 days after each inspection. 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 24 hours after final stabilization on all portions of the site has been achieved in accordance with Part I.D.2. of the permit. The Contractor shall complete and sign a Notice of Termination (NOT) in accordance with NPDES Permit No. COR10*##F. The Contractor's NOT shall be furnished to the Contracting Officer within 5 calendar days after final stabilization (as defined in the permit) has been achieved on all portions of the site. The Government 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. COR10*##F.

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 --

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18TH STREET, SUITE 500
DENVER, COLORADO 80202-2466

STORM WATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITIES

For Federal Facilities in the State of Colorado, except those located on Indian Country Lands

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et.seq.), except as provided in Part I.B.3 of this permit, operators of construction activities located in an area specified in Part I.A. and who submit a Notice of Intent in accordance with Part II, are authorized to discharge pollutants to waters of the United States in accordance with the conditions and requirements set forth herein.

This permit shall become effective on February 17, 1998

This permit and the authorization to discharge shall expire at midnight, February 17, 2003

Signed and issued this 15th day of January, 1998

Kerrigan Clough

Authorized Permitting Official

Kerrigan G. Clough, Assistant Regional Administrator
Office of Pollution Prevention, State and Tribal Assistance
Title

NOTE-THIS PAGE WILL BE REPLACED BY COPY OF SIGNED PAGE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18TH STREET, SUITE 500
DENVER, COLORADO 80202-2466

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Authorized Permitting Official

Kerrigan G. Clough, Assistant Regional Administrator
Office of Pollution Prevention, State and Tribal Assistance
Title

NPDES GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

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Preface

EPA's reissued construction general permits (CGP) were published in the Federal Register on February 17, 1998 (see 63 FR 7857). That document included the conditions for 38 separate permits involving 7 different Regions of EPA. Seven of those permits involve EPA Region VIII and this permit is one of them. In order to make this permit easier to read and understand, it has been reformatted from the style used in the Federal Register and limited to conditions and information that only apply to the area covered by this permit. References, conditions and information pertaining to all other Regions, States and Tribes that were included in the Federal Register, but not applicable to the areas covered by this permit, were removed. The conditions in this permit mimic the permits published in the Federal Register in all other ways. Persons that want CGP information for areas not covered by this permit should refer to the February 17, 1998 Federal Register or one of the other permits prepared by EPA Region VIII.

Part I. COVERAGE UNDER THIS PERMIT

A. Permit Area.

Federal Facilities in the State of Colorado, except those located on Indian Country lands.

B. Eligibility.

1. Permittees are authorized to discharge pollutants in storm water runoff associated with construction activities as defined in 40 CFR 122.26(b)(14)(x) and those construction site discharges designated by the Director as needing a storm water permit under 122.26(a)(1)(v) or under 122.26(a)(9) and 122.26(g)(1)(i). Discharges identified under Part I.B.3 are excluded from coverage. Any discharge authorized by a different NPDES permit may be commingled with discharges authorized by this permit.

2. This permit also authorizes storm water 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 a construction site that is 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 covering the discharges from the support activity areas.

3. Limitations on Coverage.

a. Post Construction Discharges. This permit does not authorize storm water discharges that originate from the site after construction activities have been completed and the site, including any temporary support activity site, has undergone final stabilization. Industrial post-construction storm water discharges may need to be covered by a separate NPDES permit.

b. Discharges Mixed with Non-Storm Water. This permit does not authorize discharges that are mixed with sources of non-storm water, other than those discharges which are identified in Part III.A.2. or 3. (exceptions to prohibition on non-storm water discharges) and are in compliance with Part IV.D.5 (non-storm water discharges).

c. Discharges Covered by Another Permit. 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 Part VI.L.

d. Discharges Threatening Water Quality. This permit does not authorize storm water discharges from construction sites that the Director (EPA) determines will cause, or have reasonable potential to cause or contribute to, violations of water quality standards. Where such determinations have been made, the Director may notify the operator(s) that an individual permit application is necessary in accordance with Part VI.L. However, the Director may authorize coverage under this permit after appropriate controls and implementation procedures designed to bring the discharges into compliance with water quality standards have been included in the storm water pollution prevention plan;

e. Storm water discharges and storm water discharge-related activities that are not protective of Federally listed endangered and threatened ("listed") species or designated critical habitat ("critical habitat").

(1) For the purposes of complying with the Part I.B.3.e. eligibility requirements, "storm water discharge-related activities" include:

(a) activities which cause, contribute to, or result in point source storm water pollutant discharges, including but not limited to: excavation, site development, grading and other surface disturbance activities; and

(b) measures to control storm water including the siting, construction and operation of best management practices (BMPs) to control, reduce or prevent storm water pollution.

(2) Coverage under this permit is available only if the applicant certifies that it meets at least one of the criteria in paragraphs (a)-(d) below. Failure to continue to meet one of these criteria during the term of the permit will render a permittee ineligible for coverage under this permit.

(a) The storm water discharges and storm water discharge-related activities are not likely to adversely affect listed species or critical habitat; or

(b) Formal or informal consultation with the Fish and Wildlife Service and/or the National Marine Fisheries Service (the "Services") under section 7 of the Endangered Species Act (ESA) has been concluded which addresses the effects of the applicant's storm water discharges and storm water discharge-related activities on listed species and critical

3. Limitations on Coverage. (Continued)

habitat and the consultation results in either a no jeopardy opinion or a written concurrence by the Service(s) on a finding that the applicant's storm water discharges and storm water discharge-related activities are not likely to adversely affect listed species or critical habitat. A section 7 consultation may occur in the context of another Federal action (e.g., a ESA section 7 consultation was performed for issuance of a wetlands dredge and fill permit for the project, or as part of a National Environmental Policy Act (NEPA) review); or

(c) The applicant's construction activities are authorized under section 10 of the ESA and that authorization addresses the effects of the applicant's storm water discharges and storm water discharge-related activities on listed species and critical habitat; or

(d) The applicant's storm water discharges and storm water discharge-related activities were already addressed in another operator's certification of eligibility under Part I.B.3.e.(2)(a), (b), or (c) which included the applicant's project area. By certifying eligibility under Part I.B.3.e.(2)(d), the applicant agrees to comply with any measures or controls upon which the other operator's certification under Part I.B.3.e.(2)(a), (b) or (c) was based.

(3) All applicants must follow the procedures provided at Addendum A of this permit when applying for permit coverage.

(4) The applicant must comply with any applicable terms, conditions or other requirements developed in the process of meeting eligibility requirements of Part I.B.3.e.(2)(a), (b), (c), or (d) above to remain eligible for coverage under this permit. Such terms and conditions must be incorporated in the applicant's storm water pollution prevention plan.

(5) Applicants who choose to conduct informal consultation to meet the eligibility requirements of Part I.B.3.e.(2)(b) are automatically designated as non-Federal representatives under this permit. See 50 CFR 402.08. Applicants who choose to conduct informal consultation as a non-Federal representatives must notify EPA and the appropriate Service office in writing of that decision.

(6) This permit does not authorize any storm water discharges where the discharges or storm water discharge-related activities cause prohibited "take" (as defined under section 3 of the Endangered Species Act and 50 CFR 17.3) of endangered or threatened species unless such takes are authorized under sections 7 or 10 of the Endangered Species Act.

(7) This permit does not authorize any storm water discharges where the discharges or storm water discharge-related activities are likely to jeopardize the continued existence of any species that are listed or proposed to be listed as endangered or threatened under the ESA or result in the adverse modification or destruction of habitat that is designated or proposed to be designated as critical under the ESA.

f. <u>Storm water Discharges and Storm Water Discharge-Related Activities with Unconsidered Adverse Effects on Historic Properties</u>. (Reserved)

C. Obtaining Authorization.

1. In order for storm water discharges from construction activities to be authorized under this general permit, an operator must:

   a. meet the Part I.B eligibility requirements;

   b. except as provided in Parts II.A.5 and II.A.6, develop a storm water pollution prevention plan (SWPPP) covering either the entire site or all portions of the site for which they are operators (see definition in Part IX.N) according to the requirements in Part IV. A "joint" SWPPP may be developed and implemented as a cooperative effort where there is more than one operator at a site; and

   c. submit a Notice of Intent (NOI) in accordance with the requirements of Part II, using an NOI form provided by the Director (or a photocopy thereof, see Addendum C, page 45). Only one NOI need be submitted to cover all of the permittee's activities on the common plan of development or sale (e.g., you do not need to submit a separate NOI for each separate lot in a residential subdivision or for two separate buildings being constructed at a manufacturing facility, provided your SWPPP covers each area for which you are an operator). The SWPPP must be implemented upon commencement of construction activities.

2. Any new operator on site, including those who replace an operator who has previously obtained permit coverage, must submit an NOI to obtain permit coverage.

3. Unless notified by the Director to the contrary, operators who submit a correctly completed NOI in accordance with the requirements of this permit are authorized to discharge storm water from construction activities under the terms and conditions of this permit two (2) days after the date that the NOI is postmarked. The Director may deny coverage under this permit and require submittal of an application for an individual NPDES permit based on a review of the NOI or other information (see Part VI.L).

D. Terminating Coverage.

1. Permittees wishing to terminate coverage under this permit must submit a Notice of Termination (NOT) in accordance with Part VIII of this permit (see Addendum D, page 47). Compliance with this permit is required until an NOT is submitted. The permittee's authorization to discharge under this permit terminates at midnight of the day the NOT is signed.

2. All permittees must submit an NOT within thirty (30) days after one or more of the following conditions have been met:

   a. final stabilization (see definition Part IX.I) has been achieved on all portions of the site for which the permittee is responsible (including if applicable, returning agricultural land to its pre-construction agricultural use);

   b. another operator/permittee has assumed control according to Part VI.G.2.c. over all areas of the site that have not been finally stabilized; or

D. Terminating Coverage. (Continued)

c. for residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

Enforcement actions may be taken if a permittee submits an NOT without meeting one or more of these conditions.

Part II. NOTICE OF INTENT REQUIREMENTS

A. Deadlines for Notification.

1. Except as provided in Parts II.A.3, II.A.4, II.A.5 or II.A.6 below, parties defined as operators (see definition in Part IX.N) due to their operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications, must submit a Notice of Intent (NOI) in accordance with the requirements of this Part at least two (2) days prior to the commencement of construction activities (i.e., the initial disturbance of soils associated with clearing, grading, excavation activities, or other construction activities).

2. Except as provided in Parts II.A.3, II.A.4, II.A.5 or II.A.6 below, parties defined as operators (see definition in Part IX.N) due to their day-to-day operational control over activities at a project which are necessary to ensure compliance with a storm water pollution prevention plan or other permit conditions (e.g., general contractor, erosion control contractor) must submit an NOI at least two (2) days prior to commencing work on-site.

3. For storm water discharges from construction projects where the operator changes, including instances where an operator is added after an NOI has been submitted under Parts II.A.1 or II.A.2, the new operator must submit an NOI at least two (2) days before assuming operational control over site specifications or commencing work on-site.

4. Operators are not prohibited from submitting late NOIs. When a late NOI is submitted, authorization is only for discharges that occur after permit coverage is granted. The Agency reserves the right to take appropriate enforcement actions for any unpermitted activities that may have occurred between the time construction commenced and authorization of future discharges is granted (typically 2 days after a complete NOI is submitted).

5. Operators of on-going construction projects as of the effective date of this permit which received authorization to discharge for these projects under the 1992 baseline construction general permit must:

   a. submit an NOI according to Part II.B. within 90 days of the effective date of this permit. If the permittee is eligible to submit a Notice of Termination (e.g., construction is finished and final stabilization has been achieved) before the 90th day, a new NOI is not required to be submitted;

   b. for the first 90 days from the effective date of this permit, comply with the terms and conditions of the 1992 baseline construction general permit they were previously authorized under; and

   c. update their storm water pollution prevention plan to comply with the requirements of Part IV within 90 days after the effective date of this permit.

A. **Deadlines for Notification.** (Continued)

6. Operators of on-going construction projects as of the effective date of this permit which did **not** receive authorization to discharge for these projects under the 1992 baseline construction general permit must:

   a. prepare and comply with an interim storm water pollution prevention plan in accordance with the 1992 baseline construction general permit prior to submitting an NOI;

   b. submit a NOI according to Part II.B; and

   c. update their storm water pollution prevention plan to comply with the requirements of Part IV within 90 days after the effective date of this permit.

B. **Contents of Notice of Intent (NOI).**

1. The NOI form shall be signed in accordance with Part VI.G of this permit and shall include the following information:

   a. the name, address, and telephone number of the operator filing the NOI for permit coverage;

   b. an indication of whether the operator is a Federal, State, Tribal, private, or other public entity;

   NOTE: All projects on Federal Facilities in Colorado must have an "F" in the Status of Owner/Operator box on the NOI. Even private contracting companies must put an "F" in that box so that we can tell its a Federal Facility project, thus regulated by EPA not the State of Colorado.

   c. the name (or other identifier), address, county, and latitude/longitude of the construction project or site;

   d. an indication of whether the project or site is located on Indian Country lands;

   e. confirmation that a storm water pollution prevention plan (SWPPP) has been developed or will be developed prior to commencing construction activities, and that the SWPPP will be compliant with any applicable local sediment and erosion control plans. Copies of SWPPPs or permits should not be included with the NOI submission;

   f. optional information: the location where the SWPPP may be viewed and the name and telephone number of a contact person for scheduling viewing times;

   g. the name of nearest named the receiving water(s);

   h. estimates of project start and completion dates, and estimates of the number of acres of the site on which soil will be disturbed (if less than 1 acre, enter "1");

   i. based on the instructions in Addendum A, whether any listed or proposed threatened or endangered species, or designated critical habitat, are in proximity to the storm water discharges or storm water discharge-related activities to be covered by this permit; and

B. Contents of Notice of Intent (NOI). (Continued)

j. under which section(s) of Part I.B.3.e. (Endangered Species) the applicant is certifying eligibility.

Note that as of the effective date of this permit, reporting of information relating to the preservation of historic properties has been reserved and is not required at this time. Such reservation in no way relieves applicants or permittees from any otherwise applicable obligations or liabilities related to historic preservation under State, Tribal or local law. After further discussions between EPA and the Advisory Council on Historic Preservation, the Agency may modify the permit. Any such modification may affect future Notice of Intent reporting requirements.

C. Where to Submit.

1. NOIs must be signed in accordance with Part VI.G. and sent to the following address:

Storm Water Notice of Intent (4203)
US EPA
401 M. Street, SW
Washington, D.C. 20460

Part III. SPECIAL CONDITIONS, MANAGEMENT PRACTICES, AND OTHER NON-NUMERIC LIMITATIONS

A. Prohibition on Non-Storm Water Discharges.

1. Except as provided in Parts I.B.2 or 3 and III.A.2 or 3, all discharges covered by this permit shall be composed entirely of storm water associated with construction activity.

2. Discharges of material other than storm water that are in compliance with an NPDES permit (other than this permit) issued for that discharge may be discharged or mixed with discharges authorized by this permit.

3. The following non-storm water discharges from active construction sites are authorized by this permit provided the non-storm water component of the discharge is in compliance with Part IV.D.5 (non-storm water discharges): discharges from fire fighting activities; fire hydrant flushings; waters used to wash vehicles where detergents are not used; water used to control dust in accordance with Part IV.D.2.c.(2); potable water sources including waterline flushings; routine external building wash down which does not use detergents; pavement washwaters 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; air conditioning condensate; uncontaminated ground water or spring water; and foundation or footing drains where flows are not contaminated with process materials such as solvents.

B. Releases in Excess of Reportable Quantities. The discharge of hazardous substances or oil in the storm water discharge(s) from a facility shall be prevented or minimized in accordance with the applicable storm water pollution prevention plan for the facility. This permit does not relieve the permittee of the reporting requirements of 40 CFR 110, 40 CFR 117 and 40 CFR 302. 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 110, 40 CFR 117 or 40 CFR 302, occurs during a 24 hour period:

1. The permittee is required to notify 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 110, 40 CFR 117 and 40 CFR 302 as soon as he or she has knowledge of the discharge;

2. The storm water pollution prevention plan required under Part IV of this permit must be modified within 14 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. In addition, the plan must be reviewed to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and the plan must be modified where appropriate.

C. Spills. This permit does not authorize the discharge of hazardous substances or oil resulting from an on-site spill.

D. Discharge Compliance with Water Quality Standards. Operators seeking coverage under this permit shall not be causing or have the reasonable potential to cause or contribute to a violation of a water quality standard. Where a discharge is already authorized under this permit and is later determined to cause or have the reasonable potential to cause or contribute to the violation of an applicable water quality standard, the Director will notify the operator of such violation(s). The permittee shall take all necessary actions to ensure future discharges do not cause or contribute to the violation of a water quality standard and document these actions in the storm water pollution prevention plan. If violations remain or

D. Discharge Compliance with Water Quality Standards. (Continued)

re-occur, then coverage under this permit may be terminated by the Director, and an alternative general permit or individual permit may be issued. Compliance with this requirement does not preclude any enforcement activity as provided by the Clean Water Act for the underlying violation.

E. Responsibilities of Operators. Permittees may meet one or both of the operational control components in the definition of "operator" found in Part IX.N. Either Parts III.E.1 or III.E.2 or both will apply depending on the type of operational control exerted by an individual permittee. Part III.E.3 applies to all permittees.

1. Permittees with operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications (e.g., developer or owner), must:

   a. ensure the project specifications that they develop meet the minimum requirements of Part IV (Storm Water Pollution Prevention Plans (SWPPP)) and all other applicable conditions;

   b. ensure that the SWPPP indicates the areas of the project where they have operational control over project specifications (including the ability to make modifications in specifications), and ensure all other permittees implementing portions of the SWPPP impacted by any changes they make to the plan are notified of such modifications in a timely manner; and

   c. ensure that the SWPPP for portions of the project where they are operators indicates the name and NPDES permit number for parties with day-to-day operational control of those activities necessary to ensure compliance with the SWPPP or other permit conditions. If these parties have not been identified at the time the SWPPP is initially developed, the permittee with operational control over project specifications shall be considered to be the responsible party until such time as the authority is transferred to another party (e.g., general contractor) and the plan updated.

2. Permittee(s) with 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., general contractor) must:

   a. ensure that the SWPPP for portions of the project where they are operators meets the minimum requirements of Part IV (Storm Water Pollution Prevention Plan) and identifies the parties responsible for implementation of control measures identified in the plan;

   b. ensure that the SWPPP indicates areas of the project where they have operational control over day-to-day activities;

   c. ensure that the SWPPP for portions of the project where they are operators indicates the name and NPDES permit number of the party(ies) with operational control over project specifications (including the ability to make modifications in specifications);

3. Permittees with operational control over only a portion of a larger construction project (e.g., one of four homebuilders in a subdivision) are responsible for compliance with all applicable terms and conditions of this permit as it relates to their activities on their portion of the construction site, including protection of endangered species and implementation of BMPs and other controls required by the SWPPP. Permittees shall ensure either directly or through coordination with other permittees, that their activities do not render another party's pollution controls ineffective. Permittees must either implement their portions of a common SWPPP or develop and implement their own SWPPP.

Part IV. STORM WATER POLLUTION PREVENTION PLANS

At least one storm water pollution prevention plan (SWPPP) shall be developed for each construction project or site covered by this permit. 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, coordination must be conducted between the permittees 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).

Storm water pollution prevention plans shall be prepared in accordance with good engineering practices. The SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges from the construction site. The SWPPP shall describe and ensure the implementation of practices which will be used to reduce the pollutants in storm water discharges associated with construction activity at the construction site and assure compliance with the terms and conditions of this permit.

When developing SWPPPs, applicants must follow the procedures in Addendum A of this permit to determine whether listed endangered or threatened species or critical habitat would be affected by the applicant's storm water discharges or storm water discharge-related activities. Any information on whether listed species or critical habitat are found in proximity to the construction site must be included in the SWPPP. Any terms or conditions that are imposed under the eligibility requirements of Part I.B.3.e and Addendum A of this permit to protect listed species or critical habitat from storm water discharges or storm water discharge-related activity must be incorporated into the SWPPP. Permittees must implement the applicable provisions of the SWPPP required under this part as a condition of this permit.

A. **Deadlines for Plan Preparation and Compliance.** The storm water pollution prevention plan shall:

1. be completed prior to the submittal of an NOI to be covered under this permit (except as provided in Parts II.A.5 and II.A.6) updated as appropriate; and

2. provide for compliance with the terms and schedule of the SWPPP beginning with the initiation of construction activities.

B. **Signature, Plan Review and Making Plans Available.**

1. The SWPPP shall be signed in accordance with Part VI.G, and be retained on-site at the facility which generates the storm water discharge in accordance with Part V (Retention of Records) of this permit.

2. The permittee shall post a notice near the main entrance of the construction site with the following information:

   a. the NPDES permit number for the project or a copy of the NOI if a permit number has not yet been assigned;

   b. the name and telephone number of a local contact person;

   c. a brief description of the project; and

B. Signature, Plan Review and Making Plans Available. (Continued)

d. the location of the SWPPP if the site is inactive or does not have an on-site location to store the plan.

If posting this information near a main entrance is infeasible due to safety concerns, the notice shall be posted in a local public building. If the construction project is a linear construction project (e.g., pipeline, highway, etc.), the notice must be placed in a publicly accessible location near where construction is actively underway and moved as necessary. This permit does not provide the public with any right to trespass on a construction site for any reason, including inspection of a site; nor does this permit require that permittees allow members of the public access to a construction site.

3. The permittee shall make SWPPPs available upon request to the Director, a State, Tribal or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; or the operator of a municipal separate storm sewer receiving discharges from the site. The copy of the SWPPP that is required to be kept on-site or locally available must be made available to the Director for review at the time of an on-site inspection. Also, in the interest of public involvement, EPA encourages permittees to make their SWPPPs available to the public for viewing during normal business hours.

4. The Director may notify the permittee at any time that the SWPPP does not meet one or more of the minimum requirements of this Part. Such notification shall identify those provision of this permit which are not being met by the SWPPP as well as those requiring modification in order to meet the minimum requirements of this Part. Within seven (7) calendar days of receipt of such notification from the Director (or as otherwise provided by the Director), the permittee shall make the required changes to the SWPPP and shall submit to the Director a written certification that the requested changes have been made. The Director may take appropriate enforcement action for the period of time the permittee was operating under a plan that did not meet the minimum requirements of this permit.

C. Keeping Plans Current. The permittee must amend the storm water pollution prevention plan whenever:

1. There is a change in design, construction, operation, or maintenance which has a significant effect on the discharge of pollutants to the waters of the United States which has not been addressed in the SWPPP; or

2. Inspections or investigations by site operators, local, State, Tribal or Federal officials indicate the SWPPP is proving ineffective in eliminating or significantly minimizing pollutants from sources identified under Part IV.D.1 of this permit, or is otherwise not achieving the general objectives of controlling pollutants in storm water discharges associated with construction activity.

D. Contents of Plan. The storm water pollution prevention plan (SWPPP) shall include the following items:

1. **Site Description.** Each SWPPP shall provide a description of potential pollutant sources and other information as indicated below:

a. a description of the nature of the construction activity;

1. **Site Description.** (Continued)

   b. a description of the intended sequence of major activities which disturb soils for major portions of the site (e.g., grubbing, excavation, grading, utilities and infrastructure installation);

   c. estimates of the total area of the site and the total area of the site that is expected to be disturbed by excavation, grading, or other activities including off-site borrow and fill areas;

   d. an estimate of the runoff coefficient of the site for both the pre-construction and post-construction conditions and data describing the soil or the quality of any discharge from the site;

   e. a general location map (e.g., a portion of a city or county map) and a site map indicating the following: drainage patterns and approximate slopes anticipated after major grading activities; areas of soil disturbance; areas which will not be disturbed; locations of major structural and nonstructural controls identified in the SWPPP; locations where stabilization practices are expected to occur; locations of off-site material, waste, borrow or equipment storage areas; surface waters (including wetlands); and locations where storm water discharges to a surface water;

   f. location and description of any discharge associated with industrial activity other than construction, including storm water discharges from dedicated asphalt plants and dedicated concrete plants, which is covered by this permit;

   g. the name of the receiving water(s) and the areal extent and description of wetland or other special aquatic sites (as described under 40 CFR 230.3(q-1)) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project;

   h. a copy of the permit requirements (attaching a copy of this permit is acceptable); and

   i. information on whether listed endangered or threatened species, or critical habitat, are found in proximity to the construction activity and whether such species may be affected by the applicant's storm water discharges or storm water discharge-related activities.

2. **Controls.** Each SWPPP shall include a description of appropriate control measures (i.e., BMPs) that will be implemented as part of the construction activity to control pollutants in storm water discharges. The SWPPP must clearly describe for each major activity identified in Part IV.D.1.b: **a)** appropriate control measures and the general timing (or sequence) during the construction process that the measures will be implemented; and **b)** which permittee is responsible for implementation (e.g., perimeter controls for one portion of the site will be installed by Contractor A after the clearing and grubbing necessary for installation of the measure, but before the clearing and grubbing for the remaining portions of the site; and perimeter controls will be actively maintained by Contractor B until final stabilization of those portions of the site up-gradient of the perimeter control; and temporary perimeter controls will be removed by the owner after final stabilization). The description and implementation of control measures shall address the following minimum components:

   a. <u>Erosion and Sediment Controls.</u>

      (1) *Short and Long Term Goals and Criteria*:

         (a) The construction-phase erosion and sediment controls should be designed to retain sediment on site to the extent practicable.

(1) *Short and Long Term Goals and Criteria*: (Continued)

(b) All control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the permittee must replace or modify the control for site situations.

(c) If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts (e.g., fugitive sediment in street could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets).

(d) Sediment must be removed from sediment traps or sedimentation ponds when design capacity has been reduced by 50%.

(e) Litter, construction debris, and construction chemicals exposed to storm water shall be prevented from becoming a pollutant source for storm water discharges (e.g., screening outfalls, picked up daily).

(f) Offsite material storage areas (also including overburden and stockpiles of dirt, borrow areas, etc.) used solely by the permitted project are considered a part of the project and shall be addressed in the SWPPP.

(2) *Stabilization Practices*: 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 attainable and that disturbed portions of the site are stabilized. Stabilization practices may include but are not limited to: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Use of impervious surfaces for stabilization should be avoided.

The following records shall be maintained and attached 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.

Except as provided in Parts IV.D.2.a.(2)(a), (b), and (c) below, stabilization measures shall 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.

(a) Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable.

(b) Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of site.

(2) *Stabilization Practices*: (Continued)

(c) In arid areas (areas with an average annual rainfall of 0 to 10 inches), semi-arid areas (areas with an average annual rainfall of 10 to 20 inches), and areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.

(3) *Structural Practices:* The SWPPP must include a description of structural practices to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. Structural practices may include but are not limited to: silt fences, earth dikes, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. Placement of structural practices in floodplains should be avoided to the degree attainable. The installation of these devices may be subject to section 404 of the CWA.

(a) For common drainage locations that serve an area with ten (10) or more acres disturbed at one time, a temporary (or permanent) sediment basin that provides storage for a calculated volume of runoff from a 2 year, 24 hour storm from each disturbed acre drained, or equivalent control measures, shall 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, shall be provided where attainable until final stabilization of the site. When computing the number of acres draining into an common location it is not necessary to include flows from offsite areas and flows from onsite 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 permittee may consider factors such as site soils, slope, available area on site, etc. In any event, the permittee must consider public safety, especially as it relates to children, as a design factor for the sediment basin and alternative sediment controls shall be used where site limitations would a preclude a safe design. For drainage locations which serve ten (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. Where neither the sediment basin nor equivalent controls are attainable due to site limitations, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area and for those side slope boundaries deemed appropriate as dictated by individual site conditions. EPA encourages the use of a combination of sediment and erosion control measures in order to achieve maximum pollutant removal.

(b) 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

(3) *Structural Practices*: (Continued)

of runoff from a 2 year, 24 hour storm or 3,600 cubic feet of storage per acre drained is provided. EPA encourages the use of a combination of sediment and erosion control measures in order to achieve maximum pollutant removal.

b. Storm Water Management. A description of measures that will be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed must be included in the SWPPP. Structural measures should be placed on upland soils to the degree attainable. The installation of these devices may also require a separate permit under section 404 of the CWA. Permittees are only responsible for the installation and maintenance of storm water management measures prior to final stabilization of the site, and are not responsible for maintenance after storm water discharges associated with construction activity have been eliminated from the site. However, post-construction storm water BMPs that discharge pollutants from point sources once construction is completed, may in themselves, need authorization under a separate NPDES permit.

(1) Such practices may include but are not limited to: storm water detention structures (including wet ponds); storm water retention structures; flow attenuation by use of open vegetated swales and natural depressions; infiltration of runoff onsite; and sequential systems (which combine several practices). The SWPPP shall include an explanation of the technical basis used to select the practices to control pollution where flows exceed predevelopment levels.

(2) Velocity dissipation devices shall 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).

c. Other Controls.

(1) No solid materials, including building materials, shall be discharged to waters of the United States, except as authorized by a permit issued under section 404 of the CWA.

(2) Off-site vehicle tracking of sediments and the generation of dust shall be minimized.

(3) The SWPPP shall be consistent with applicable State, Tribal and/or local waste disposal, sanitary sewer or septic system regulations to the extent these are located within the permitted area.

(4) The SWPPP shall include a description of construction and waste materials expected to be stored on-site with updates as appropriate. The SWPPP shall also include a description of controls to reduce pollutants from these materials including storage practices to minimize exposure of the materials to storm water, and spill prevention and response.

(5) The SWPPP shall 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.

c. Other Controls. (Continued)

(6) The SWPPP shall include a description of measures necessary to protect listed endangered or threatened species, or critical habitat, including any terms or conditions that are imposed under the eligibility requirements of Part I.B.3.e (4) of this permit. Failure to describe and implement such measures will result in storm water discharges from construction activities that are ineligible for coverage under this permit.

d. Approved State, Tribal or Local Plans.

(1) Permittees which discharge storm water associated with construction activities must ensure their storm water pollution prevention plan is consistent with requirements specified in applicable sediment and erosion site plans or site permits, or storm water management site plans or site permits approved by State, Tribal, or local officials.

(2) Storm water pollution prevention plans must be updated as necessary to remain consistent with any changes applicable to protecting surface water resources in sediment and erosion site plans or site permits, or storm water management site plans or site permits approved by State, Tribal or local officials for which the permittee receives written notice..

3. **Maintenance.** 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 Part IV.D.4. identify BMPs that are not operating effectively, maintenance shall be performed before the next anticipated storm event, or as necessary to maintain the continued effectiveness of storm water controls. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable.

4. **Inspections.** Qualified personnel (provided by the permittee or cooperatively by multiple permittees) shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, and locations where vehicles enter or exit the site, at least once every fourteen (14) calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

Where sites have been finally or temporarily stabilized, runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or frozen ground exists), or during seasonal arid periods in arid areas (areas with an average annual rainfall of 0 to 10 inches) and semi-arid areas (areas with an average annual rainfall of 10 to 20 inches) such inspections shall be conducted at least once every month.

Permittees are eligible for a waiver of monthly inspection requirements 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.

a. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Sediment and erosion control measures identified in the SWPPP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to

4. **Inspections.** (Continued)

receiving waters. Where discharge locations are inaccessible, nearby downstream locations shall be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.

b. Based on the results of the inspection, the SWPPP shall be modified as necessary (e.g., show additional controls on map required by Part IV.D.1; revise description of controls required by Part IV.D.2) to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP shall be completed within 7 calendar days following the inspection. If existing BMPs need to be modified or if additional BMPs are necessary, implementation shall be completed before the next anticipated storm event. If implementation before the next anticipated storm event is impracticable, they shall be implemented as soon as practicable.

c. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, and major observations relating to the implementation of the SWPPP shall be made and retained as part of the SWPPP for at least three years from the date that the site is finally stabilized. Major observations should include: the location(s) of discharges of sediment or other pollutants from the site; location(s) of BMPs that need to be maintained; location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location; and location(s) where additional BMPs are needed that did not exist at the time of inspection. Actions taken in accordance with Part IV.D.4.b of this permit shall be made and retained as part of the storm water pollution prevention plan for at least three years from the date that the site is finally stabilized. Such reports shall identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with Part VI.G of this permit.

5. **Non-Storm Water Discharges.** Except for flows from fire fighting activities, sources of non-storm water listed in Part III.A.2 or 3 of this permit that are combined with storm water discharges associated with construction activity must be identified in the SWPPP. The SWPPP shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

Part V. RETENTION OF RECORDS

A. **Documents.** The permittee shall retain copies of storm water pollution prevention plans and all reports required by this permit, and records of all data used to complete the Notice of Intent to be covered by this permit, for a period of at least three years from the date that the site is finally stabilized. This period may be extended by request of the Director at any time.

B. **Accessibility.** The permittee shall retain a copy of the storm water pollution prevention plan required by this permit (including a copy of the permit language) at the construction site (or other local location accessible to the Director, a State, Tribal or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; or the operator of a municipal separate storm sewer receiving discharges from the site) from the date of project initiation to the date of final stabilization. Permittees with day-to-day operational control over SWPPP implementation shall have a copy of the SWPPP available at a central location on-site for the use of all operators and those identified as having responsibilities under the SWPPP whenever they are on the construction site.

C. **Addresses.** Except for the submittal of NOIs and NOTs (see Parts II.C and VIII.B, respectively), all written correspondence concerning discharges in any State, Indian Country land or from any Federal facility covered under this permit and directed to the EPA, including the submittal of individual permit applications, shall be sent to the following address:

United States EPA, Region 8
Ecosystems Protection Program (8EPR-EP)
Storm Water Staff
999 18th Street, Suite 500
Denver, CO 80202-2466

Part VI. STANDARD PERMIT CONDITIONS

A. Duty to Comply.

1. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of CWA and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

2. **Penalties for Violations of Permit Conditions.** The Director will adjust the civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (Federal Register: December 31, 1996, Volume 61, Number 252, pages 69359-69366, as corrected, March 20, 1997, Volume 62, Number 54, pages 13514-13517) as mandated by the Debt Collection Improvement Act of 1996 for inflation on a periodic basis. This rule allows EPA's penalties to keep pace with inflation. The Agency is required to review its penalties at least once every four years thereafter and to adjust them as necessary for inflation according to a specified formula. The civil and administrative penalties listed below were adjusted for inflation starting in 1996.

   a. Criminal.

      (1) *Negligent Violations.* The CWA provides that any person who negligently violates permit conditions implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both.

      (2) *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both.

      (3) *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he is placing another person in imminent danger of death or serious bodily injury is subject to a fine of not more than $250,000, or by imprisonment for not more than 15 years, or both.

      (4) *False Statement.* The CWA provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act, shall upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than two years, or by both. If a conviction is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or by both. (See section 309.c.4 of the Clean Water Act).

   b. Civil Penalties. The CWA provides that any person who violates a permit condition implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed $27,500 per day for each violation.

2. **Penalties for Violations of Permit Conditions.** (Continued)

   c. Administrative Penalties. The CWA provides that any person who violates a permit condition implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows:

      (1) *Class I Penalty.* Not to exceed $11,000 per violation nor shall the maximum amount exceed $27,500.

      (2) *Class II Penalty.* Not to exceed $11,000 per day for each day during which the violation continues nor shall the maximum amount exceed $137,500.

B. **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 Procedures Act and remain in force and effect. Any permittee who was granted permit coverage prior to the expiration date will automatically remain covered by the continued permit until the earlier of:

   1. Reissuance or replacement of this permit, at which time the permittee must comply with the Notice of Intent conditions of the new permit to maintain authorization to discharge; or

   2. the permittee's submittal of a Notice of Termination; or

   3. issuance of an individual permit for the permittee's discharges; or

   4. a formal permit decision by the Director not to reissue this general permit, at which time the permittee must seek coverage under an alternative general permit or an individual permit.

C. **Need to Halt or Reduce Activity not a Defense.** It shall not be a defense for a permittee 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.

D. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. **Duty to Provide Information.** The permittee shall furnish to the Director or an authorized representative of the Director any information which is requested to determine compliance with this permit or other information.

F. **Other Information.** When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the Director, he or she shall promptly submit such facts or information.

G. **Signatory Requirements.** All Notices of Intent, Notices of Termination, storm water pollution prevention plans, reports, certifications or information either submitted to the Director or the operator of a large or medium municipal separate storm sewer system, or that this permit requires be maintained by the permittee, shall be signed as follows:

   1. All Notices of Intent and Notices of Termination shall be signed as follows:

G. **Signatory Requirements.** (Continued)

a. for a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: 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 the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25,000,000 (in second-quarter 1980 dollars) if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. for a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

c. for a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (1) the chief executive officer of the agency, or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. All reports required by this permit and other information requested by the Director or authorized representative of the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. the authorization is made in writing by a person described above and submitted to the Director.

b. 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 manager, operator, superintendent, or 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).

c. Changes to Authorization. If an authorization under Part II.B is no longer accurate because a different operator has responsibility for the overall operation of the construction site, a new Notice of Intent satisfying the requirements of Part II.B must be submitted to the Director 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 Part II.A.3, and sent to the address specified in Part II.C.

d. Certification. Any person signing documents under Part VI.G shall make 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."

H. **Penalties for Falsification of Reports.** Section 309(c)(4) of the Clean Water Act provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two years, or by both.

I. **Oil and Hazardous Substance Liability.** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under section 311 of the CWA or section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

J. **Property Rights.** The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

K. **Severability.** The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

L. **Requiring an Individual Permit or an Alternative General Permit.**

1. The Director may require any person authorized by this permit to apply for and/or obtain either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition the Director to take action under this paragraph. Where the Director requires a permittee authorized to discharge under this permit to apply for an individual NPDES permit, the Director shall notify the permittee in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the permittee to file the application, and 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 the individual permittee, coverage under this general permit shall automatically terminate. Applications shall be submitted to the appropriate Regional Office indicated in Part V.C of this permit. The Director may grant additional time to submit the application upon request of the applicant. If a permittee fails to submit in a timely manner an individual NPDES permit application as required by the Director under this paragraph, then the applicability of this permit to the individual NPDES permittee is automatically terminated at the end of the day specified by the Director for application submittal.

2. Any permittee authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual permit. In such cases, the permittee shall submit an individual application in accordance with the requirements of 40 CFR 122.26(c)(1)(ii), with reasons supporting the request, to the Director at the address for the appropriate Regional Office indicated in Part V.C of this permit. The request may be granted by issuance of any individual permit or an alternative general permit if the reasons cited by the permittee are adequate to support the request.

3. When an individual NPDES permit is issued to a permittee otherwise subject to this permit, or the permittee is authorized to discharge under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee 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. When an individual NPDES permit is denied to an owner or operator otherwise subject to this permit, or the owner or operator is denied for coverage under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the date of such denial, unless otherwise specified by the Director.

M. State/Tribal Environmental Laws.

1. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State/Tribal law or regulation under authority preserved by section 510 of the Act.

2. No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

N. Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of this permit.

O. Inspection and Entry. The permittee shall allow the Director or an authorized representative of EPA, the State/Tribe, or, in the case of a construction site which discharges through a municipal separate storm sewer, an authorized representative of the municipal owner/operator or the separate storm sewer receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

P. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

Part VII. REOPENER CLAUSE

A. If there is evidence indicating that the storm water discharges authorized by this permit cause, have the reasonable potential to cause or contribute to, a violation of a water quality standard, the permittee may be required to obtain an individual permit or an alternative general permit in accordance with Part I.C of this permit, or the permit may be modified to include different limitations and/or requirements.

B. Permit modification or revocation will be conducted according to 40 CFR 122.62, 122.63, 122.64 and 124.5.

C. EPA may propose a modification to this permit after further discussions between the Agency and the Advisory Council on Historic Preservation for the protection of historic properties.

Part VIII. TERMINATION OF COVERAGE

A. Notice of Termination. Permittees must submit a completed Notice of Termination (NOT) that is signed in accordance with Part VI.G of this permit when one or more of the conditions contained in Part I.D.2. (Terminating Coverage) have been met at a construction project. The NOT form found in Addendum D will be used unless it has been replaced by a revised version by the Director. The Notice of Termination shall include the following information:

1. The NPDES permit number for the storm water discharge identified by the Notice of Termination;

2. An indication of whether the storm water discharges associated with construction activity have been eliminated (i.e., regulated discharges of storm water are being terminated) or the permittee is no longer an operator at the site;

3. The name, address and telephone number of the permittee submitting the Notice of Termination;

4. The name of the project and street address (or a description of location if no street address is available) of the construction site for which the notification is submitted;

5. The latitude and longitude of the construction site; and

6. The following certification, signed in accordance with Part VI.G (signatory requirements) of this permit. For construction projects with more than one permittee and/or operator, the permittee need only make this certification for those portions of the construction site where the permittee was authorized under this permit and not for areas where the permittee was not an operator:

   "I certify under penalty of law that all storm water discharges associated with industrial activity from the identified facility that authorized by a general permit have been eliminated or that I am no longer the operator of the facility or construction site. I understand that by submitting this notice of termination, I am no longer authorized to discharge storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this Notice of Termination does not release an operator from liability for any violations of this permit or the Clean Water Act."

   For the purposes of this certification, elimination of storm water discharges associated with construction activity means that all disturbed soils at the portion of the construction site where the operator had control have been finally stabilized (as defined in Part IX.I) and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time to ensure final stabilization is maintained, or that all storm water discharges associated with construction activities from the identified site that are authorized by a NPDES general permit have otherwise been eliminated from the portion of the construction site where the operator had control.

B. Addresses.

1. All Notices of Termination, signed in accordance with Part VI.G of this permit, are to be submitted using the form provided by the Director (or a photocopy thereof), to the address specified on the NOT form.

Part IX. DEFINITIONS

A. "**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 practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

B. "**Control Measure**" as used in this permit, refers to any Best Management Practice or other method used to prevent or reduce the discharge of pollutants to waters of the United States.

C. "**Commencement of Construction**" the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.

D. "**CWA**" means the Clean Water Act or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq.

E. "**Director**" means the Regional Administrator of the Environmental Protection Agency or an authorized representative.

F. "**Discharge**" when used without qualification means the "discharge of a pollutant."

G. "**Discharge of Storm Water Associated with Construction Activity**" as used in this permit, refers to a discharge of pollutants in storm water runoff from areas where soil disturbing activities (e.g., clearing, grading, or excavation), construction materials or equipment storage or maintenance (e.g., fill piles, borrow areas, concrete truck washout, fueling), or other industrial storm water directly related to the construction process (e.g., concrete or asphalt batch plants) are located.

H. "**Facility or Activity**" means any NPDES "point source" or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

I. "**Final Stabilization**" means that either:

1. All soil disturbing activities at the site have been completed and a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 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. In some parts of the country, background native vegetation will cover less than 100% of the ground (e.g., arid areas, beaches). Establishing at least 70% of the natural cover of native vegetation meets the vegetative cover criteria for final stabilization (e.g., if the native vegetation covers 50% of the ground, 70% of 50% would require 35% total cover for final stabilization; on a beach with no natural vegetation, no stabilization is required); or

2. For individual lots in residential construction by either: **a)** the homebuilder completing final stabilization as specified above, or **b)** the homebuilder establishing 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. (Homeowners typically have an incentive to put in landscaping functionally equivalent to final stabilization as quick as possible to keep mud out of their homes and off their sidewalks and driveways.); or

I. "**Final Stabilization**" (continued)

3. For construction projects on land used for agricultural purposes (e.g., pipelines across crop or range land), 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 "waters of the United States," and areas which are not being returned to their preconstruction agricultural use must meet the final stabilization criteria in (1) or (2) above.

J. "**Flow-Weighted Composite Sample**" means a composite sample consisting of a mixture of aliquots collected at a constant time interval, where the volume of each aliquot is proportional to the flow rate of the discharge.

K. "**Large and Medium Municipal Separate Storm Sewer System**" - means all municipal separate storm sewers that are either:

1. Located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and G of 40 CFR 122); or

2. Located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties (these counties are listed in Appendices H and I of 40 CFR 122); or

3. Owned or operated by a municipality other than those described in paragraph (i) or (ii) and that are designated by the Director as part of the large or medium municipal separate storm sewer system.

L. "**NOI**" means Notice of Intent to be covered by this permit (see Part II of this permit.)

M. "**NOT**" means Notice of Termination (see Part VIII of this permit).

N. "**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 storm water pollution prevention plan 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.

O "**Owner or Operator**" means the owner or operator of any "facility or activity" subject to regulation under the NPDES program.

P. "**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.

Q. "**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.

R. "**Runoff Coefficient**" means the fraction of total rainfall that will appear at the conveyance as runoff.

S. "**Storm Water**" means storm water runoff, snow melt runoff, and surface runoff and drainage.

T. "**Storm Water Associated with Industrial Activity**" is defined at 40 CFR 122.26(b)(14) and incorporated here by reference. Most relevant to this permit is 40 CFR 122.26(b)(14)(x), which relates to construction activity including clearing, grading and excavation activities that result in the disturbance of five (5) or more acres of total land area, or are part of a larger common plan of development or sale.

U. "**Waters of the United States**" means:

1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

2. All interstate waters, including interstate "wetlands";

3. All other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

   a. Which are or could be used by interstate or foreign travelers for recreational or other purposes;
   b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
   c. Which are used or could be used for industrial purposes by industries in interstate commerce;

4. All impoundments of waters otherwise defined as waters of the United States under this definition;

5. Tributaries of waters identified in paragraphs (a) through (d) of this definition;

6. The territorial sea; and

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs 1. through 6. of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds for steam electric generation stations per 40 CFR 423) which also meet the criteria of this definition) are not waters of the United States. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

ADDENDUM A - ENDANGERED SPECIES

I. Instructions for Applicants

A. Background

To meet its obligations under the Clean Water Act and the Endangered Species Act (ESA) and to promote those Acts' goals, the Environmental Protection Agency (EPA) is seeking to ensure the activities regulated by the Construction General Permit (CGP) are protective of endangered and threatened species and critical habitat. To ensure that those goals are met, applicants for CGP coverage are required under Part I.B.3.e. to assess the impacts of their storm water discharges and storm water discharge-related activities on Federally listed endangered and threatened species ("listed species") and designated critical habitat ("critical habitat") by following Steps One through Six listed below. EPA strongly recommends that applicants follow these steps at the earliest possible stage to ensure that measures to protect listed species and critical habitat are incorporated early in the planning process. At minimum, the procedures should be followed when developing the storm water pollution prevention plan.

Permittees and applicants also have an independent ESA obligation to ensure that their activities do not result in any prohibited "takes" of listed species.[1] Many of the measures required in the CGP and in these instructions to protect species may also assist permittees in ensuring that their construction activities do not result in a prohibited take of species in violation of § 9 of the ESA. Applicants who plan construction activities in areas that harbor endangered and threatened species are advised to ensure that they are protected from potential takings liability under ESA § 9 by obtaining either an ESA § 10 permit or by requesting formal consultation under ESA § 7 (as described in more detail in Step Seven below). Applicants who seek protection from takings liability should be aware that it is possible that some specific construction activities may be too unrelated to storm water discharges to be afforded incidental take coverage through an ESA § 7 consultation that is performed to meet the eligibility requirements for CGP coverage. In such instances, applicants should apply for an ESA § 10 permit. Where applicants are not sure whether to pursue a § 10 permit or a § 7 consultation for takings protection, they should confer with the appropriate Fish and Wildlife Service (FWS) or National Marine Fisheries Service (NMFS) office.

This permit provides for the possibility of multiple permittees at a construction site. Applicants should be aware that in many cases they can meet the permit eligibility requirements by relying on another operator's certification of eligibility under Part I.B.3.e.(2)(a), (b), or (c). This is allowed under Part I.B.3.e.(2)(d) of the permit. However, the other operator's certification must apply to the applicant's project area and must address the effects from the applicant's storm water discharges and storm water discharge-related activities on listed species and critical habitat. By certifying eligibility under Part I.B.3.e.(2)(d), the applicant agrees to comply with any measures or controls upon which the other operator's certification under Part I.B.3.e.(2)(a), (b) or (c) was based. This situation will typically occur where a developer or primary contractor, such as one for construction of a subdivision or industrial park, conducts a comprehensive assessment of effects on listed species and critical habitat for the entire construction project, certifies eligibility under Part I.B.3.e.(2)(a), (b) or (c), and that certification is relied upon by other operators (i.e., contractors) at the site. However, applicants

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[1] Section 9 of the ESA prohibits any person from "taking" a listed species (e.g., harassing or harming it) unless: 1) the taking is authorized through a "incidental take statement" as part of undergoing ESA § 7 formal consultation; 2) where an incidental take permit is obtained under ESA § 10 (which requires the development of a habitat conservation plan); or 3) where otherwise authorized or exempted under the ESA. This prohibition applies to all entities including private individuals, businesses, and governments.

A. Background (Continued)

that consider relying on another operator's certification should carefully review that certification along with any supporting information. If an applicant does not believe that the operator's certification provides adequate coverage for the applicant's storm water discharges and storm water discharge-related activities or for the applicant's particular project area, the applicant should provide its own independent certification under Part I.B.3.e.(2)(a), (b), or (c).

B. Procedures

To receive coverage under the Construction General Permit, applicants must assess the potential effects of their storm water discharges and storm water discharge-related activities on listed species and their critical habitat. To make this assessment, applicants must follow the steps outlined below prior to completing and submitting Notice of Intent (NOI) form. Applicants who are able to certify eligibility under Parts I.B.3.e.(2)(b), (c) or (d) because of a previously issued ESA § 10 permit, a previously completed ESA § 7 consultation, or because the applicant's activities were already addressed in another operator's certification of eligibility may proceed directly to Step Six.

Note - EPA's new NOI form which is included in Addendum C of this permit (published in the Federal Register on March 6, 1998, 63 FR 11253), requires that applicants provide detailed certification information on listed species. Previous versions of NOI forms should not be used any longer because they do not contain the specific certification provisions relating to listed species and critical habitats at construction projects. Use of the older NOI forms do **not** relieve applicants of their obligation to follow the procedures listed below to determine if their construction storm water discharges or storm water discharge-related activities meet permit eligibility requirements for the protection of listed species and critical habitat. By following these instructions, applicants will have sufficient information on listed species and critical habitat in order to complete the new NOI form (see Addendum C, page 45) and sign the certification statement.

Step One: Determine if the Construction Site Is Found Within Designated Critical Habitat for Listed Species

Some, but not all, listed species have designated critical habitat. Exact locations of such habitat is provided in the Service regulations at 50 CFR Parts 17 and 226. To determine if their construction site occurs within designated critical habitat, applicants should either:

- Contact the nearest Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) Office. A list of FWS and NMFS offices is found in Section II of this Addendum; or

- Contact the State or Tribal Natural Heritage Centers. These centers compile and disseminate information on Federally listed and other protected species. They frequently have the most current information on listed species and critical habitat. A list of these centers is provided in Section III of this Addendum; or

Step Three: (Continued)

- Contacting the nearest State or Tribal wildlife agency, the Fish and Wildlife Service (FWS), or the National Marine Fisheries Service (NMFS). Many endangered and threatened species are found in well-defined areas or habitats. Such information is frequently known to State, Tribal, or Federal wildlife agencies. A list of FWS and NMFS offices is provided in Section II of this Addendum below.

- Contacting local/regional conservation groups or the State or Tribal Natural Heritage Centers (see Section III of this Addendum). State and local conservation groups may have location specific listed species information. The Natural Heritage Centers inventory species and their locations and maintain lists of sightings and habitats.

- Submitting a data request to a Natural Heritage Center. Many of these centers will provide site specific information on the presence of listed species in a project area. Some of these centers will charge a fee for researching data requests.

- Conducting a formal biological survey. Larger construction sites with extensive storm water discharges may choose to conduct biological surveys as the most effective way to assess whether species are located in the project area and whether there are likely adverse effects. Biological surveys are frequently performed by environmental consulting firms. A biological survey can be used to follow Steps Four through Six of these instructions.

- Conducting an environmental assessment under the National Environmental Policy Act (NEPA). Some construction activities may require environmental assessments under NEPA. Such assessments may indicate if listed species are in the project area. Coverage under the CGP does not trigger such an assessment because the permit does not regulate any dischargers subject to New Source Performance Standards under Section 306 of the Clean Water Act, and is thus statutorily exempted from NEPA. See CWA § 511(c). However, some construction activities might require review under NEPA because of Federal funding or other Federal involvement in the project.

If no species are found in the project area, an applicant is eligible for CGP coverage. Applicants must provide the necessary certification on the NOI form. If listed species are found in the project area, applicants must indicate the location and nature of this presence in the storm water pollution prevention plan and follow Step Four.

Step Four: Determine if Listed Species or Critical Habitat are likely to be Adversely Affected by the Construction Activity's Storm Water Discharges or Storm Water Discharge-related Activities.

To receive CGP coverage, applicants must assess whether their storm water discharges or storm water discharge-related activities are likely to adversely affect listed species or critical habitat. "Storm water discharge-related activities" include:

- activities which cause, contribute to, or result in point source storm water pollutant discharges, including but not limited to excavation, site development, grading, and other surface disturbance activities; and

Step Four: (Continued)

- measures to control storm water discharges including the siting, construction, operation of best management practices (BMPs) to control, reduce or prevent storm water pollution.

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 which 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 the applicant is having difficulty in determining whether his or her project is likely to adversely effect a listed specie or critical habitat, then the appropriate office of the FWS, NMFS or Natural Heritage Center listed in Sections II and III of this Addendum should be contacted for assistance. If adverse effects are not likely, then the applicant should make the appropriate certification on the NOI form and apply for coverage under the permit. If adverse effects are likely, applicants must follow Step Five.

Step Five: Determine if Measures Can Be Implemented To Avoid any Adverse Effects

If an applicant makes a preliminary determination that adverse effects are likely, it can still receive coverage under Part I.B.3.e.(2)(a) of the CGP if appropriate measures are undertaken to avoid or eliminate the likelihood of adverse effects prior to applying for permit 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. Applicants may wish to 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 which is described in more detail in Step Six.

Step Five: (Continued)

If applicants adopt measures to avoid or eliminate adverse affects, they must continue to abide by those measures during the course of permit coverage. These measures must be described in the storm water pollution prevention plan and may be enforceable as permit conditions. If appropriate measures to avoid the likelihood of adverse effects are not available to the applicant, the applicant must follow Step Six.

Step Six: Determine if the Eligibility Requirements of Part I.B.3.e.(2)(b)-(d) Can Be Met.

Where adverse effects are likely, the applicant must contact the EPA and FWS/NMFS. Applicants may still be eligible for CGP coverage if any likely adverse effects can be addressed through meeting the criteria of Part I.B.3.e.(2)(b)-(d)of the permit. These criteria are as follows:

1. An ESA Section 7 Consultation is Performed for the Applicant's Activity (See Part I.B.3.e.(2)(b)

   Formal or informal ESA § 7 consultation is performed with the FWS and/or NMFS which addresses the effects of the applicant's storm water discharges and storm water discharge-related activities on listed species and critical habitat. The formal consultation must result in either a "no jeopardy opinion" or a "jeopardy opinion" that identifies reasonable and prudent alternatives to avoid jeopardy which are to be implemented by the applicant. The informal consultation must result in a written concurrence by the Service(s) on a finding that the applicant's storm water discharge(s) and storm water discharge-related activities are not likely to adversely affect listed species or critical habitat (for informal consultation, see 50 CFR 402.13).

   Most consultations are accomplished through informal consultation. By the terms of this permit, EPA has automatically designated applicants as non-Federal representatives for the purpose of conducting informal consultations. See Part I.B.3.e.(5) and 50 CFR 402.08 and 402.13. When conducting informal ESA § 7 consultation as a non-Federal representative, applicants must follow the procedures found in 50 CFR 402 of the ESA regulations.

   Applicants must also notify EPA and the Services of their 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 § 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 which 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, applicants may, if they wish, initiate consultation with the Services at Step Five.

   Whether ESA § 7 consultation must be performed with either the FWS, NMFS or both Services depends on the listed species which may be affected by the applicant's activity. In general, NMFS has jurisdiction over marine, estuarine, and anadromous species. Applicants should also be aware that while formal § 7 consultation provides protection from incidental takings liability, informal consultation does not.

Step Six: (Continued)

2. An Incidental Taking Permit Under Section 10 of the ESA is Issued for the Applicants Activity (See Part I.B.3.e.(2)(c))

   The applicant's construction activities are authorized through the issuance of a permit under § 10 of the ESA and that authorization addresses the effects of the applicant's storm water discharge(s) and storm water discharge-related activities on listed species and critical habitat. Applicants must follow FWS and/or NMFS procedures when applying for an ESA Section 10 permit (see 50 CFR § 17.22(b)(1) (FWS) and § 222.22 (NMFS)). Application instructions for Section 10 permits for NMFS species can be obtained by 1) accessing the "Office of Protected Resources" sector of the NMFS Home Page at "http://www.nmfs.gov" or by contacting the National Marine Fisheries Service, Office of Protected Resources, Endangered Species Division, F/PR3, 1315 East-West Highway, Silver Spring, Maryland 20910; telephone (301) 713-1401, fax (301) 713-0376.

3. The Applicant Is Covered Under the Eligibility Certification of Another Operator for the Project Area (See Part I.B.3.e.(2)(d))

   The applicant's storm water discharges and storm water discharge-related activities were already addressed in another operator's certification of eligibility under Part I.B.3.e.(2)(b), or (c) which also included the applicant's project area. By certifying eligibility under Part I.B.3.e.(2)(d), the applicant agrees to comply with any measures or controls upon which the other operator's certification under Part I.B.3.e.(2)(a), (b) or (c) was based. Certification under Part I.B.3.e.(2)(d) is discussed in more detail in Section I.A. of this addendum.

   The applicant must comply with any terms and conditions imposed under the eligibility requirements of paragraphs I.B.3.e(2)(a), (b), (c), (d) to ensure that its 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 Part I.B.3.e.(2)(a)-(d) cannot be met, then the applicant may not receive coverage under the CGP. Applicants should then consider applying to EPA for an individual permit.

II. LIST OF FISH AND WILDLIFE SERVICE OFFICES

A. U.S. FISH AND WILDLIFE SERVICE OFFICES

National Website For Endangered Species Information

Endangered Species Home page:
http://www.fws.gov/~r9endspp/endspp.html

Regional, State, Field and Project Offices Applicable to This Permit.

Region Six - Regional Office	
Division Chief, Endangered Species U.S. Fish and Wildlife Service ARD-Ecological Services P.O. Box 25486, DFC Denver, CO 80225	
State, Field, and Project Offices (Region Six)	
Field Supervisor U.S. Fish and Wildlife Service Colorado Field Office 730 Simms, Suite 290 Golden, CO 80401-4798	Field Supervisor U.S. Fish and Wildlife Service Western Colorado Field Office 764 Horizon Drive South, Annex A Grand Junction, CO 81506-3946
E.S. Coordinator U.S. Fish and Wildlife Service Rocky Mountain Arsenal National Wildlife Area, Building 111 Commerce City, CO 80022-1748	Colorado River Recovery Coordinator U.S. Fish and Wildlife Service P.O. Box 25486, DFC Denver, CO 80225

III. NATURAL HERITAGE CENTER

The Natural Heritage Network comprises 85 biodiversity data centers throughout the Western Hemisphere. These centers collect, organize, and share data relating to endangered and threatened species and habitat. The network was developed to inform land-use decisions for developers, corporations, conservationists, and government agencies and is also consulted for research and educational purposes. The centers maintain a **Natural Heritage Network Control Server Website (http://www.heritage.tnc.org)** which provides website and other access to a large number of specific biodiversity centers. The center located in Colorado is listed below:

Colorado Natural Heritage Program
Colorado State University
254 General Services Building
Fort Collins, CO 80523
970/491-1309 Fax: 970/491-3349

IV. COUNTY LIST OF ENDANGERED AND THREATENED SPECIES IN COLORADO

[The following list identifies federally listed or proposed U.S. species by State and County. It has been updated through September 1, 1997.]

Note: Species listed below with a status of both E and T are generally either endangered or threatened within the specified county. The assignment of two status designations for a species in a specific county is a function of the data set used to develop this list. For purposes of this permit, however, the obligation to assess the impact of storm water discharges on listed species does not vary based on which of the two statuses (e.g., endangered threatened) is assigned (see Addendum A Instructions). Designation of critical habitat (CH) does not mean that the county constitutes critical habitat, only that critical habitat has been designated for that species (see Addendum A Instructions).

State/County	Group name	Inverse name	Scientific name	Action/ Status
COLORADO				
ADAMS	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
ALAMOSA	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
ARCHULETA	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
BACA	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
BENT	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
BOULDER	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
	PLANTS	LADIES'-TRESSES, UTE	Spiranthes diluvialis	L,T
CHAFFEE	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
CHEYENNE	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
CLEAR CREEK	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
CONEJOS	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
COSTILLA	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
CUSTER	BIRDS	FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
DELTA	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
	FISHES	SQUAWFISH, COLORADO	Ptychocheilus lucius	L,CH
		SUCKER, RAZORBACK	Xyrauchen texanus	L,E,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	CACTUS, SPINELESS HEDGEHOG	Echinocereus triglochidiatus var. inermis	L,E
		CACTUS, UINTA BASIN HOOKLESS	Sclerocactus glaucus(=Echinocactus g.,S. whipplei)	L,T
		WILD-BUCKWHEAT, CLAY-LOVING	Eriogonum pelinophilum	L,E,CH
DOLORES	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
DOUGLAS	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
	INSECTS	SKIPPER, PAWNEE MONTANE	Hesperia leonardus (=pawnee) montana	L,T
EAGLE	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
EL PASO	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH

Key: L - Listed, P - Proposed, E - Endangered, T - Threatened, CH - Critical Habitat

IV. COUNTY/SPECIES LIST CONTINUED

The following list identifies federally listed or proposed U.S. species by State and County. It has been updated through September 1, 1997.

State/County	Group name	Inverse name	Scientific name	Action/ Status
	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
FREMONT	BIRDS	OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
GARFIELD	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
	FISHES	SQUAWFISH, COLORADO	Ptychocheilus lucius	L,CH
		SUCKER, RAZORBACK	Xyrauchen texanus	L,E,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	CACTUS, UINTA BASIN HOOKLESS	Sclerocactus glaucus(=Echinocactus g.,S. whipplei)	L,T
GRAND	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	PLANTS	BEARDTONGUE, PENLAND	Penstemon penlandii	L,E
		MILK-VETCH, OSTERHOUT	Astragalus osterhoutii	L,E
GUNNISON	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
HINSDALE	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
HUERFANO	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
JACKSON	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
	PLANTS	PHACELIA, NORTH PARK	Phacelia formosula	L,E
JEFFERSON	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	INSECTS	SKIPPER, PAWNEE MONTANE	Hesperia leonardus (=pawnee) montana	L,T
	PLANTS	LADIES'-TRESSES, UTE	Spiranthes diluvialis	L,T
KIOWA	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
LA PLATA	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	CACTUS, KNOWLTON	Pediocactus knowltonii	L,E
LAKE	BIRDS	OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
LARIMER	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
LAS ANIMAS	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
LINCOLN	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
LOGAN	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
MESA	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
	FISHES	CHUB, BONYTAIL	Gila elegans	L,E,CH
		CHUB, HUMPBACK	Gila cypha	L,E,CH
		SQUAWFISH, COLORADO	Ptychocheilus lucius	L,CH
		SUCKER, RAZORBACK	Xyrauchen texanus	L,E,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	CACTUS, SPINELESS HEDGEHOG	Echinocereus triglochidiatus var. inermis	L,E
		CACTUS, UINTA BASIN HOOKLESS	Sclerocactus glaucus(=Echinocactus g.,S. whipplei)	L,T
MOFFAT	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	FISHES	CHUB, BONYTAIL	Gila elegans	L,E,CH
		CHUB, HUMPBACK	Gila cypha	L,E,CH

Key: L - Listed, P - Proposed, E - Endangered, T - Threatened, CH - Critical Habitat

IV. COUNTY/SPECIES LIST CONTINUED

The following list identifies federally listed or proposed U.S. species by State and County. It has been updated through September 1, 1997.

State/County	Group name	Inverse name	Scientific name	Action/ Status
		SQUAWFISH, COLORADO	Ptychocheilus lucius	L,CH
		SUCKER, RAZORBACK	Xyrauchen texanus	L,E,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
MONTEZUMA	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	FISHES	SQUAWFISH, COLORADO	Ptychocheilus lucius	L,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	CACTUS, MESA VERDE	Sclerocactus mesae-verdae (=Pediocactus m.)	L,T
		MILK-VETCH, MANCOS	Astragalus humillimus	L,E
MONTROSE	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	CACTUS, SPINELESS HEDGEHOG	Echinocereus triglochidiatus var. inermis	L,E
		CACTUS, UINTA BASIN HOOKLESS	Sclerocactus glaucus(=Echinocactus g.,S. whipplei)	L,T
		WILD-BUCKWHEAT, CLAY-LOVING	Eriogonum pelinophilum	L,E,CH
MORGAN	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	PLANTS	LADIES'-TRESSES, UTE	Spiranthes diluvialis	L,T
OTERO	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
OURAY	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
PARK	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	FISHES	TROUT, GREENBACK CUTTHROAT	Salmo clarki stomias	L,T
	INSECTS	SKIPPER, PAWNEE MONTANE	Hesperia leonardus (=pawnee) montana	L,T
	PLANTS	MUSTARD, PENLAND ALPINE FEN	Eutrema penlandii	L,T
PITKIN	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
PROWERS	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
PUEBLO	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
RIO BLANCO	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	FISHES	SQUAWFISH, COLORADO	Ptychocheilus lucius	L,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	BLADDERPOD, DUDLEY BLUFFS	Lesquerella congesta	L,T
		TWINPOD, DUDLEY BLUFFS	Physaria obcordata	L,T
RIO GRANDE	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
ROUTT	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
SAGUACHE	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
SAN JUAN	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
SAN MIGUEL	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
		FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	INSECTS	BUTTERFLY, UNCOMPAHGRE FRITILLARY	Boloria acrocnema	L,E
	MAMMALS	FERRET, BLACK-FOOTED	Mustela nigripes	L,E
	PLANTS	CACTUS, SPINELESS HEDGEHOG	Echinocereus triglochidiatus var. inermis	L,E
SEDGWICK	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T

Key: L - Listed, P - Proposed, E - Endangered, T - Threatened, CH - Critical Habitat

IV. COUNTY/SPECIES LIST CONTINUED

The following list identifies federally listed or proposed U.S. species by State and County. It has been updated through September 1, 1997.

State/County	Group name	Inverse name	Scientific name	Action/ Status
SUMMIT	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
	PLANTS	MUSTARD, PENLAND ALPINE FEN	Eutrema penlandii	L,T
TELLER	BIRDS	FALCON, PEREGRINE	Falco peregrinus	L,E
		OWL, MEXICAN SPOTTED	Strix occidentalis lucida	L,T,CH
	INSECTS	SKIPPER, PAWNEE MONTANE	Hesperia leonardus (=pawnee) montana	L,T
WASHINGTON	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T
WELD	BIRDS	CRANE, WHOOPING	Grus americana	L,E,CH
		EAGLE, BALD	Haliaeetus leucocephalus	L,T
	PLANTS	LADIES'-TRESSES, UTE	Spiranthes diluvialis	L,T
YUMA	BIRDS	EAGLE, BALD	Haliaeetus leucocephalus	L,T

Key: L - Listed, P - Proposed, E - Endangered, T - Threatened, CH - Critical Habitat

ADDENDUM B - HISTORIC PROPERTIES (RESERVED)

Instructions related to historic preservation have not been included in the permit at this time. EPA may modify the permit to include such provisions at a later date. This does not relieve applicants or permittees of their responsibility to comply with applicable State, Tribal or local laws for the protection of historic properties.

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THIS FORM REPLACES PREVIOUS FORM 3510-6 (8-98)
See Reverse for Instructions

Form Approved. OMB No. 2040-0188

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 constitutes notice that the party identified in Section I of this form intends to be authorized by a NPDES permit issued for storm water discharges associated with construction activity in the State/Indian Country Land identified in Section II of this form. Submission of this Notice of Intent also constitutes notice that the party identified in Section I of this form meets the eligibility requirements in Part I.B. of the general permit (including those related to protection of endangered species determined through the procedures in Addendum A of the general permit), understands that continued authorization to discharge is contingent on maintaining permit eligibility, and that implementation of the Storm Water Pollution Prevention Plan required under Part IV of the general permit will begin at the time the permittee commences work on the construction project identified in Secion II below. IN ORDER TO OBTAIN AUTHORIZATION, ALL INFORMATION REQUESTED MUST BE INCLUDED ON THIS FORM. SEE INSTRUCTIONS ON BACK OF FORM.

I. Owner/Operator (Applicant) Information

Name: _____ Phone: _____

Address: _____ Status of Owner/Operator: P

City: _____ State: ____ Zip Code: _____–____

II. Project/Site Information

Is the facility located on Indian Country Lands? Yes ☐ No ☐

Project Name: _____

Project Address/Location: _____

City: _____ State: ____ Zip Code: _____–____

Latitude: _____ Longitude: _____ County: _____

Has the Storm Water Pollution Prevention Plan (SWPPP) been prepared? Yes ☐ No ☐

Optional: Address of location of SWPPP for viewing ☐ Address in Section I above ☐ Address in Section II above ☐ Other address (if known) below:

SWPPP Address: _____ Phone: _____

City: _____ State: ____ Zip Code: _____–____

Name of Receiving Water: _____

Estimated Construction Start Date: Month Day Year

Estimated Completion Date: Month Day Year

Estimate of area to be disturbed (to nearest acre): _____

Estimate of Likelihood of Discharge (choose only one):

1. ☐ Unlikely
2. ☐ Once per month
3. ☐ Once per week
4. ☐ Once per day
5. ☐ Continual

Based on instruction provided in Addendum A of the permit, are there any listed endangered or threatened species, or designated critical habitat in the project area?

Yes ☐ No ☐

I have satisfied permit eligibility with regard to protection of endangered species through the indicated section of Part I.B.3.e.(2) of the permit (check one or more boxes):

(a) ☐ (b) ☐ (c) ☐ (d) ☐

III. 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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this 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: _____ Date: _____

Signature: _____

Instructions – EPA Form 3510-9

Form Approved. OMB No. 2040-0188

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity to be Covered Under a NPDES Permit

Who Must File a Notice of Intent Form

Under the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et.seq.; the Act), except as provided by Part I.B.3 the permit, Federal law prohibits discharges of pollutants in storm water from construction activities without a National Pollutant Discharge Elimination System Permit. Operator(s) of construction sites where 5 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 5 acres, or any site designated by the Director, must submit an NOI to obtain coverage under an NPDES Storm Water Construction General Permit. If you have questions about whether you need a permit under the NPDES Storm Water program, or if you need information as to whether a particular program is administered by EPA or a State agency, write to or telephone the Notice of Intent Processing Center at (703) 931-3230.

Where to File NOI Form

NOIs must be sent to the following address:

Storm Water Notice of Intent (4203)
USEPA
401 M. Street, SW
Washington, D.C. 20460

Do not send Storm Water Pollution Prevention Plans (SWPPPs) to the above address. For overnight/express delivery of NOIs, please include the room number 2104 Northeast Mall and phone number (202) 260-9541 in the address.

When to File

This form must be filed at least 48 hours before construction begins.

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, call the Notice of Intent Processing Center at (703) 931-3230.

Section I. Facility Owner/Operator (Applicant) Information

Provide the legal name, mailing address, and telephone number of the person, firm, public organization, or any other entity that meet either of the following two criteria: (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 the day-to-day operational control of those activities at the project necessary to ensure compliance with SWPPP requirements or other permit conditions. Each person that meets either of these criteria must file this form. Do not use a colloquial name. Correspondence for the permit will be sent to this address.

Enter the appropriate letter to indicate the legal status of the owner/operator of the project: F = Federal; S = State; M = Public (other than federal or state); P = Private.

Section II. Project/Site Information

Enter the official or legal name and complete street address, including city, county, state, zip code, and phone number of the project or site. If it lacks a street address, indicate with a general statement the 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 in degrees, minutes, and seconds to the nearest 15 seconds. The latitude and longitude of your facility can be located on USGS quadrangle maps. Quadrangle maps can be obtained by calling 1-800 USA MAPS. Longitude and latitude may also be obtained at the Census Bureau Internet site: http://www.census.gov/cgi-bin/gazetteer.

Latitude and longitude for a facility in decimal form must be converted to degrees, minutes and seconds for proper entry on the NOI form. To convert decimal latitude or longitude to degrees, minutes, and seconds, follow the steps in the following example.

Convert decimal latitude 45.1234567 to degrees, minutes, and seconds.

1) The numbers to the left of the decimal point are degrees.
2) To obtain minutes, multiply the first four numbers to the right of the decimal point by 0.006. 1234 x .006 = 7.404.
3) The numbers to the left of the decimal point in the result obtained in step 2 are the minutes: 7'.
4) To obtain seconds, multiply the remaining three numbers to the right of the decimal from the result in step 2 by 0.06: 404 x 0.06 = 24.24. Since the numbers to the right of the decimal point are not used, the result is 24".
5) The conversion for 45.1234 = 45° 7' 24".

Indicate whether the project is on Indian Country Lands.

Indicate if the Storm Water Pollution Prevention Plan (SWPPP) has been developed. Refer to Part IV of the general permit for information on SWPPPs. To be eligible for coverage, a SWPPP must have been prepared.

Optional: Provide the address and phone number where the SWPPP can be viewed if different from addresses previously given. Check appropriate box.

Enter the name of the closest water body which receives the project's construction storm water discharge.

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 acre; if less than 1 acre, enter "1." Note: 1 acre = 43,560 sq. ft.

Indicate your best estimate of the likelihood of storm water discharges from the project. EPA recognizes that actual discharges may differ from this estimate due to unforeseen or chance circumstances.

Indicate if there are any listed endangered or threatened species, or designated critical habitat in the project area.

Indicate which Part of the permit that the applicant is eligible with regard to protection of endangered or threatened species, or designated critical habitat.

Section III. Certification

Federal Statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (i) 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, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if 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 of the proprietor, or

For a municipality, state, federal, or other public facility: by either a principal executive or ranking elected official. An unsigned or undated NOI form will not be granted 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: Director, OPPE Regulatory Information Division (2137), U.S. Environmental Protection Agency, 401 M Street, SW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

THIS FORM REPLACES PREVIOUS FORM 3510-7 (8-92)

Please See Instructions Before Completing This Form

Form Approved. OMB No. 2040-0086
Approval expires: 8-31-98

NPDES FORM

United States Environmental Protection Agency
Washington, DC 20460

Notice of Termination (NOT) of Coverage Under a NPDES General Permit for Storm Water Discharges Associated with Industrial 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 industrial activity under the NPDES program. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.

I. Permit Information

NPDES Storm Water General Permit Number: _____

Check Here if You are No Longer the Operator of the Facility: ☐

Check Here if the Storm Water Discharge is Being Terminated: ☐

II. Facility Operator Information

Name: _____ Phone: _____

Address: _____

City: _____ State: _____ ZIP Code: _____

III. Facility/Site Location Information

Name: _____

Address: _____

City: _____ State: _____ ZIP Code: _____

Latitude: _____ Longitude: _____ Quarter: _____ Section: _____ Township: _____ Range: _____

IV. Certification:

I certify under penalty of law that all storm water discharges associated with industrial activity from the identified facility that are authorized by a NPDES general permit have been eliminated or that I am no longer the operator of the facility or construction site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this Notice of Termination does not release an operator from liability for any violations of this permit or the Clean Water Act.

Print Name: _____ Date: _____

Signature: _____

Instructions for Completing Notice of Termination (NOT) Form

Who May File a Notice of Termination (NOT) Form

Permittees who are presently covered under an EPA-issued National Pollutant Discharge Elimination System (NPDES) General Permit (including the 1995 Multi-Sector Permit) for Storm Water Dicharges Associated with Industrial Activity may submit a Notice of Termination (NOT) form when their facilities no longer have any storm water discharges associated with industrial activity as defined in the storm water regulations at 40 CFR 122.26(b)(14), or when they are no longer the operator of the facilities.

For construction activities, elimination of all storm water discharges associated with industrial activity occurs when disturbed soils at the construction site have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with industrial activity from the construction site that are authorized by a NPDES general permit have otherwise been eliminated. 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 70% of the cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

Where to File NOT Form

Send this form to the the following address:

Storm Water Notice of Termination (4203)
401 M Street, S.W.
Washington, DC 20460

Completing the Form

Type or print, using upper-case 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, telephone or write the Notice of Intent Processing Center at (703) 931-3230.

Instructions - EPA Form 3510-7
Notice of Termination (NOT) of Coverage Under The NPDES General Permit
for Storm Water Discharges Associated With Industrial Activity

Section I Permit Information

Enter the existing NPDES Storm Water General Permit number assigned to the facility or site identified in Section III. If you do not know the permit number, telephone or write your EPA Regional storm water contact person.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box:

If there has been a change of operator and you are no longer the operator of the facility or site identified in Section III, check the corresponding box.

If all storm water discharges at the facility or site identified in Section III have been terminated, check the corresponding box.

Section II Facility Operator Information

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same name as the facility. The operator of the facility is the legal entity which controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Section III Facility/Site Location Information

Enter the facility's or site's official or legal name and complete address, including city, state and ZIP code. If the facility lacks a street address, indicate the state, the latitude and longitude of the facility to the nearest 15 seconds, or the quarter section, township, and range (to the nearest quarter section) of the approximate center of the site.

Section IV Certification

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (i) 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, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if 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; or

For a municipality, State, Federal, or other public facility: by either a principal executive officer or ranking elected official.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. 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, 401M Street, SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

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SECTION 02300A

EARTHWORK
12/97

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.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO T 180	(1997) Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and an 457 mm (18-in) Drop
AASHTO T 224	(1996) Correction for Coarse Particles in the Soil Compaction Test

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates
ASTM D 422	(1963; R 1998) Particle-Size Analysis of Soils
ASTM D 1140	(1997) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve
ASTM D 1556	(1990; R 1996el) Density and Unit Weight of Soil in Place by the Sand-Cone Method
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 2167	(1994) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2487	(1998) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	(1996el) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 2937	(1994) Density of Soil in Place by the Drive-Cylinder Method

ASTM D 3017	(1988; R 1996el) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 4318	(1998) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

1.2 MEASUREMENT

1.2.1 Excavation

The unit of measurement for excavation and borrow will be the cubic yard, computed by the average end area method from cross sections taken before and after the excavation and borrow operations. The volume to be paid for will be the number of cubic yards of material measured in its original position and removed from the excavation and borrow areas, including the excavation for ditches, gutters, and channel changes, when the material is acceptably utilized or disposed of as herein specified. The measurements will include authorized excavation of rock, authorized excavation of unsatisfactory subgrade soil, and the volume of loose, scattered rocks and boulders collected within the limits of the work; allowance will be made on the same basis for selected backfill ordered as replacement. The measurement will not include the volume of subgrade material or other material that is scarified or plowed and reused in-place, and will not include the volume excavated without authorization or the volume of any material used for purposes other than directed. The volume of overburden stripped from borrow pits and the volume of excavation for ditches to drain borrow pits, unless used as borrow material, will not be measured for payment. The measurement will not include the volume of any excavation performed prior to the taking of elevations and measurements of the undisturbed grade.

1.2.2 Topsoil Requirements

Separate excavation, hauling, and spreading or piling of topsoil and related miscellaneous operations will be considered subsidiary obligations of the Contractor, covered under the contract unit price for excavation.

1.2.3 Overhaul Requirements

The unit of measurement for overhaul will be the station-yard. The number of station-yards of overhaul to be paid for will be the product of number of cubic yards of overhaul material measured in the original position, multiplied by the overhaul distance measured in stations of 100 feet. The overhaul distance will be the distance in stations between the center of volume of the overhaul material in its original position and the center of volume after placing, minus the free-haul distance in stations. The haul distance will be measured along the shortest route determined by the Contracting Officer as feasible and satisfactory. Unsatisfactory materials or waste will not be measured for overhaul where the length of haul for borrow is within the free-haul limits.

1.3 PAYMENT

Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

1.3.1 Classified Excavation

Classified excavation will be paid for at the contract unit prices per cubic yard for common or rock excavation.

1.3.2 Unclassified Excavation

Unclassified excavation will be paid for at the contract unit price per cubic yard for unclassified excavation.

1.3.3 Classified Borrow

Classified borrow will be paid for at the contract unit prices per cubic yard for common or rock borrow.

1.3.4 Unclassified Borrow

Unclassified borrow will be paid for at the contract unit price per cubic yard for unclassified borrow.

1.3.5 Authorized Overhaul

Authorized overhaul will be paid for at the contract unit price per station-yard for overhaul in excess of the free-haul limit as designated in paragraph DEFINITIONS.

1.4 DEFINITIONS

1.4.1 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,] [ML,] [CL-ML,] [CH,] [MH]. Satisfactory materials for grading shall be comprised of stones less than 8 inches, except for fill material for pavements and railroads which shall be comprised of stones less than 3 inches in any dimension.

1.4.2 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.

1.4.3 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.

1.4.4 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 1557abbreviated 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.

1.4.5 Overhaul

Overhaul is the authorized transportation of satisfactory excavation or borrow materials in excess of the free-haul limit of [_____] stations. Overhaul is the product of the quantity of materials hauled beyond the free-haul limit, and the distance such materials are hauled beyond the free-haul limit, expressed in station yards.

1.4.6 Topsoil

Material suitable for topsoils obtained from [offsite areas] [excavations] [areas indicated on the drawings] is defined as [_____].

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

Earthwork; [_____], [_____].

Procedure and location for disposal of unused satisfactory material. Blasting plan when blasting is permitted. Proposed source of borrow material.

Notification of encountering rock in the project. Advance notice on the opening of excavation or borrow areas. Advance notice on shoulder construction for rigid pavements.

SD-06 Test Reports

Testing; [_____], [_____].

Within 24 hours of conclusion of physical tests, [_____] 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.

1.6 SUBSURFACE DATA

Subsurface soil boring logs are [shown on the drawings] [appended to the

SPECIAL CONTRACT REQUIREMENTS]. The subsoil investigation report and samples of materials taken from subsurface investigations may be examined at [_____]. These data represent the best subsurface information available; however, variations may exist in the subsurface between boring locations.

1.7 CLASSIFICATION OF EXCAVATION

[No consideration will be given to the nature of the materials, and all excavation will be designated as unclassified excavation.] [Excavation specified shall be done on a classified basis, in accordance with the following designations and classifications.]

1.7.1 Rock Excavation

Rock excavation shall include blasting, excavating, grading, and disposing of material classified as rock and shall include the satisfactory removal and disposal of boulders 1/2 cubic yard or more in volume; solid rock; rock material that is in ledges, bedded deposits, and unstratified masses, which cannot be removed without systematic drilling and blasting; and firmly cemented conglomerate deposits possessing the characteristics of solid rock impossible to remove without systematic drilling and blasting. The removal of any concrete or masonry structures, except pavements, exceeding 1/2 cubic yard in volume that may be encountered in the work shall be included in this classification. If at any time during excavation, including excavation from borrow areas, the Contractor encounters material that may be classified as rock excavation, such material shall be uncovered and the Contracting Officer notified by the Contractor. The Contractor shall not proceed with the excavation of this material until the Contracting Officer has classified the materials as common excavation or rock excavation and has taken cross sections as required. Failure on the part of the Contractor to uncover such material, notify the Contracting Officer, and allow ample time for classification and cross sectioning of the undisturbed surface of such material will cause the forfeiture of the Contractor's right of claim to any classification or volume of material to be paid for other than that allowed by the Contracting Officer for the areas of work in which such deposits occur.

1.7.2 Common Excavation

Common excavation shall include the satisfactory removal and disposal of all materials not classified as rock excavation.

1.8 BLASTING

[Blasting shall be performed as specified in Section [_____]. The Contractor shall submit a Blasting Plan and obtain written approval prior to performing any blasting. The plan shall contain provisions for storing, handling and transporting explosives as well as for the blasting operations. The Contractor shall be responsible for damage caused by blasting operations.] [Blasting will not be permitted.]

1.9 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. Newly designated waste areas on Government-controlled land shall be cleared and grubbed before disposal of waste material thereon. 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.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 STRIPPING OF TOPSOIL

Where indicated or directed, topsoil shall be stripped to a depth of [_____] 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 [stockpiled in locations indicated] [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. Where pile foundations are to be used, the excavation of each pit shall be stopped at an elevation 1 foot above the base of the footing, as specified, before piles are driven. After the pile driving has been completed, loose and displaced material shall be removed and excavation completed, leaving a smooth, solid, undisturbed surface to receive the concrete or masonry.

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 [shown on drawings] [within the limits of the project site, selected by the Contractor] [or] [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. Borrow material from approved sources on Government-controlled land may be obtained without payment of royalties. 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 OPENING AND DRAINAGE OF EXCAVATION AND BORROW PITS

The Contractor shall notify the Contracting Officer sufficiently in advance of the opening of any excavation or borrow pit to permit elevations and measurements of the undisturbed ground surface to be taken. Except as otherwise permitted, borrow pits and other excavation areas shall be excavated providing adequate drainage. Overburden and other spoil material shall be transported to designated spoil areas or otherwise disposed of as directed. Borrow pits shall be neatly trimmed and drained after the excavation is completed. The Contractor shall ensure that excavation of any area, operation of borrow pits, or dumping of spoil material results in minimum detrimental effects on natural environmental conditions.

3.5 GRADING AREAS

Where indicated, work will be divided into grading areas within which satisfactory excavated material shall be placed in embankments, fills, and required backfills. The Contractor shall not haul satisfactory material excavated in one grading area to another grading area except when so

directed in writing.

3.6 BACKFILL

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, and Section 02630 STORM-DRAINAGE SYSTEM; and Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.7 PREPARATION OF GROUND SURFACE FOR EMBANKMENTS

3.7.1 General Requirements

Ground surface on which fill is to be placed shall be stripped of live, dead, or decayed vegetation, rubbish, debris, and other unsatisfactory material; plowed, disked, or otherwise broken up to a depth of [_____]; pulverized; 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 shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. The prepared ground surface shall be scarified and moistened or aerated as required just prior to placement of embankment materials to assure adequate bond between embankment material and the prepared ground surface.

3.7.2 Frozen Material

Embankment shall not be placed on a foundation which contains frozen material, or which has been subjected to freeze-thaw action. This prohibition encompasses all foundation types, including the natural ground, all prepared subgrades (whether in an excavation or on an embankment) and all layers of previously placed and compacted earth fill which become the foundations for successive layers of earth fill. All material that freezes or has been subjected to freeze-thaw action during the construction work, or during periods of temporary shutdowns, such as, but not limited to, nights, holidays, weekends, winter shutdowns, or earthwork operations, shall be removed to a depth that is acceptable to the Contracting Officer and replaced with new material. Alternatively, the material will be thawed, dried, reworked, and recompacted to the specified criteria before additional material is placed. The Contracting Officer will determine when placement of fill shall cease due to cold weather. The Contracting Officer may elect to use average daily air temperatures, and/or physical observation of the soils for his determination. Embankment material shall not contain frozen clumps of soil, snow, or ice.

3.8 EMBANKMENTS

3.8.1 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 [_____] inchesin 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.

3.8.2 Rock Embankments

Rock embankments shall be constructed from material classified as rock excavation, as defined above, placed in successive horizontal layers of loose material not more than [_____] inches in depth. Pieces of rock larger than [_____] inches in the greatest dimension shall not be used. Each layer of material shall be spread uniformly, completely saturated, and compacted to a minimum density of [_____] pcf. Each successive layer of material shall adequately bond to the material on which it is placed. Compaction shall be accomplished with vibratory compactors weighing at least [_____] tons, heavy rubber-tired rollers weighing at least [_____] tons, or steel-wheeled rollers weighing at least [_____] tons. [Rock excavation shall not be used as fill material for the construction of pavements.][In embankments on which pavements are to be constructed, rock shall not be used above a point [_____] inch below the surface of the pavement.]

3.9 SUBGRADE PREPARATION

3.9.1 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. [After rolling, the surface of the subgrade for roadways shall not show deviations greater than [_____] inch when tested with a [_____] foot straightedge applied both parallel and at right angles to the centerline of the area.] [After rolling, the surface of the subgrade for airfields shall not show deviations greater than [_____] inch when tested with a [_____] foot straightedge applied both parallel and at right angles to the centerline of the area.] The elevation of the finish subgrade shall not vary more than 0.05 foot from the established grade and cross section.

3.9.2 Compaction

Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. Except for paved areas and railroads, each layer of the embankment shall be compacted to at least [_____] percent of laboratory maximum density.

3.9.2.1 Subgrade for Railroads

Subgrade for railroads shall be compacted to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials.

3.9.2.2 Subgrade for Pavements

Subgrade for pavements shall be compacted to at least [_____] percentage 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 [_____] inches of subgrade shall be scarified, windrowed, thoroughly blended, reshaped, and compacted.

3.9.2.3 Subgrade for Shoulders

Subgrade for shoulders shall be compacted to at least [_____] percentage laboratory maximum density for the [depth below the surface of shoulder shown] [full depth of the shoulder].

3.10 SHOULDER CONSTRUCTION

Shoulders shall be constructed of satisfactory excavated or borrow material or as otherwise shown or specified. Shoulders shall be constructed as soon as possible after adjacent paving is complete, but in the case of rigid pavements, shoulders shall not be constructed until permission of the Contracting Officer has been obtained. The entire shoulder area shall be compacted to at least the percentage of maximum density as specified in paragraph SUBGRADE PREPARATION above, for specific ranges of depth below the surface of the shoulder. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. Shoulder construction shall be done in proper sequence in such a manner that adjacent ditches will be drained effectively and that no damage of any kind is done to the adjacent completed pavement. The completed shoulders shall be true to alignment and grade and shaped to drain in conformity with the cross section shown.

3.11 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.

3.12 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 [_____] 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] [areas indicated].

3.13 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 1556] [ASTM D 2167] [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 2922results 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.] [ASTM D 2937, Drive Cylinder Method shall be used only for soft, fine-grained, cohesive soils.] 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.

3.13.1 Fill and Backfill Material Gradation

One test per [_____] cubic yards stockpiled or in-place source material. Gradation of fill and backfill material shall be determined in accordance with [ASTM C 136] [ASTM D 422] [ASTM D 1140].

3.13.2 In-Place Densities

a. One test per [_____] square feet, or fraction thereof, of each lift of fill or backfill areas compacted by other than hand-operated machines.

b. One test per [_____] square feet, or fraction thereof, of each lift of fill or backfill areas compacted by hand-operated machines.

c. One test per [_____] linear feet, or fraction thereof, of each lift of embankment or backfill for [roads] [airfields].

d. One test per [_____] linear feet, or fraction thereof, of each lift of embankment or backfill for railroads.

3.13.3 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 [_____] square feet, or fraction thereof, of each lift of fill or backfill compacted by other than hand-operated machines.

b. One check test per lift for each [_____] square feet, of fill or backfill areas compacted by hand-operated machines.

c. One check test per lift for each [_____] linear feet, or fraction thereof, of embankment or backfill for [roads] [airfields].

d. One check test per lift for each [_____] linear feet, or fraction thereof, of embankment or backfill for railroads.

3.13.4 Moisture Contents

In the stockpile, excavation, or borrow areas, a minimum of two tests per day per type of material or source of material being placed during stable weather conditions shall be performed. During unstable weather, tests shall be made as dictated by local conditions and approved by the Contracting Officer.

3.13.5 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 [_____] cubic yards of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.

3.13.6 Tolerance Tests for Subgrades

Continuous checks on the degree of finish specified in paragraph SUBGRADE PREPARATION shall be made during construction of the subgrades.

3.14 SUBGRADE AND EMBANKMENT PROTECTION

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.

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SECTION 02440

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SECTION 02440

TRAFFIC SIGNS
10/01

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 A 36/A 36M	(2000) Carbon Structural Steel
ASTM A 123/A 123M	(2001) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM B 209	(2001) Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B 209M	(2001) Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
ASTM D 4956	(2001) Retroreflective Sheeting for Traffic Control

FEDERAL HIGHWAY ADMINISTRATION

MUTCD	(2000) Manual on Uniform Traffic Control Devices

1.2 SUBMITTALS (NOT USED)

1.3 GENERAL

All sign faces shall conform to MUTCD.

PART 2 PRODUCTS

2.1 SIGN POSTS

2.1.1 Steel Flanged Channel Section (U-Shape)

Steel posts shall be fabricated from steel conforming to ASTM A 36/A 36M and shall have a minimum yield strength of 30 ksi and a minimum tensile strength of 50 ksi. Steel posts shall have 5/16 to 3/8 inch diameter holes spaced at 1 or 2 inch centers punched or drilled along the centerline of the web prior to galvanizing for the entire length of the post. Posts shall be galvanized in accordance with ASTM A 123/A 123M.

2.2 ALUMINUM SIGN PANELS

Aluminum sign panels shall conform to ASTM B 209, alloy no.-temper 6061-T6 or 5052-H38. The blanks shall be free from laminations, blisters, open seams, pits, holes, other defects that may affect their appearance or use. The thickness shall be uniform and the blank commercially flat.

2.3 RETROREFLECTIVE SHEETING

Retroreflective sheeting shall conform to ASTM D 4956, Type I, II, III, IV, V, or VI. Type I retroreflective sheeting shall conform to ASTM D 4956, except the minimum coefficients of retroreflection for brown type I sheeting shown in Table I of ASTM D 4956 are amended as follows: 2.0 $cd/fc/ft^2$ at 0.2 degrees observation angle and -4 degrees entrance angle, 1.0 $cd/fc/ft^2$ at 0.2 degrees observation angle and +30 degrees entrance angle and at 0.5 degrees observation angle and -4 degrees entrance angle, and 0.5 $cd/fc/ft^2$ at 0.5 degrees observation angle and +30 degrees entrance angle. All retroreflective sheeting shall have a precoated adhesive which will permanently adhere to the sign panel surface.

2.4 HARDWARE

Bolts, nuts and metal washers shall be either aluminum alloy or commercial quality steel, hot-dip galvanized or cadmium plated after fabrication. Fiber washers shall be of commercial quality.

PART 3 EXECUTION

3.1 GENERAL

Insulating material shall be placed to prevent contact between aluminum and steel material.

3.2 SIGN POSTS

Steel sign posts shall either be driven with a suitable driving head or set in drilled or punched holes. Any posts damaged during driving or otherwise shall be replaced at no additional cost to the Government. [Sign posts shall be painted in accordance with Section 09900 PAINTING, GENERAL. Color shall be as indicated in Section 09915 COLOR SCHEDULE.]

3.3 SIGN PANELS

Clean, degrease and etch the face of metal panels using methods recommended by the retroreflective sheeting manufacturer. After cleaning and degreasing, retroreflective sheeting material shall be applied to the sign panels as recommended by the manufacturer. Shearing, cutting and punching shall be performed prior to preparing the blanks for application of reflective material. Holes shall not be field drilled in any part of the panel. [The back side of all sign panels shall be stamped with the month and year that the sign was manufactured. The date shall be located on the lower right side of the back of the sign panel and shall be approximately 1/4 inch high. The date shall be stamped into the sign panel material for a permanent record.] [The backs of sign panels shall be painted in accordance with Section 09900 PAINTING, GENERAL. Color shall be as indicated in Section 09915 COLOR SCHEDULE.] Any damaged sign panels shall be replaced at no additional cost to the Government.

3.4 LETTERS, NUMERALS, ARROWS, SYMBOLS, AND BORDERS

Letters, numerals, arrows, symbols, and borders shall be applied on the

retroreflective sheeting or opaque background of the sign using the direct or reverse screen process. Messages and borders of a color darker than the background shall be applied to the paint or the retroreflective sheeting using the direct process. Messages and borders shall be of a color lighter than the sign background and shall be applied using the reverse screen process. Opaque or transparent colors, inks, and paints of the type and quality recommended by the retroreflective sheeting manufacturer shall be used in the screen process. The screening shall be performed in a manner that results in a uniform color and tone, with sharply defined edges of legends and borders and without blemishes on the sign background that will affect intended use. The signs shall be air dried or baked after screening according to the manufacturer's recommendations to provide a smooth hard finish. Any signs with blister's or other blemishes shall be rejected.

3.5 LOCATION AND POSITION OF SIGNS

All signs shall be located and erected in accordance with the drawings and MUTCD. Unless otherwise shown, signs shall be erected with the sign faces and posts vertical. To reduce specular glare (mirror reflection), sign panels shall be turned 3 degrees away from the road in the direction of travel. The Contracting Officer's Representative shall inspect all signs for specular reflection at night after installation has been completed. If specular reflection is apparent on any sign, it shall be adjusted by the Contractor at his expense to eliminate or minimize specular reflection to the satisfaction of the Contracting Officer's Representative.

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GAS DISTRIBUTION SYSTEM
10/98

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 GAS ASSOCIATION (AGA)

AGA Manual	(1994; Addenda/Correction Jan 1996) A.G.A. Plastic Pipe Manual for Gas Service

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI B109.2	(1992) Diaphragm Type Gas Displacement Meters (500 Cubic Feet per Hour Capacity and Over)

AMERICAN PETROLEUM INSTITUTE (API)

API Spec 5L	(1995; Errata Dec 1997) Line Pipe
API Spec 6D	(1994; Supple 1 Jun 1996; Supple 2 Dec 1997) Pipeline Valves (Gate, Plug, Ball, and Check Valves)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 53	(1999) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A 181/A 181M	(1995b) Carbon Steel, Forgings for General-Purpose Piping
ASTM D 2513	(1999a) 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	(1999) Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
ASTM D 3308	(1997) PTFE Resin Skived Tape
ASTM D 3350	(1998a) Polyethylene Plastics Pipe and Fittings Materials

ASME INTERNATIONAL (ASME)

ASME B1.20.1	(1983; R 1992) Pipe Threads, General Purpose (Inch)
ASME B16.5	(1996; B16.5a) Pipe Flanges and Flanged Fittings NPS 1/2 thru NPS 24
ASME B16.9	(1993) Factory-Made Wrought Steel Buttwelding Fittings
ASME B16.11	(1996) Forged Fittings, Socket-Welding and Threaded
ASME B16.21	(1992) Nonmetallic Flat Gaskets for Pipe Flanges
ASME B16.34	(1997) Valves - Flanged, Threaded, and Welding End
ASME B16.40	(1985; R 1994) Manually Operated Thermoplastic Gas Shutoffs and Valves in Gas Distribution Systems
ASME B31.8	(1995) Gas Transmission and Distribution Piping Systems
ASME BPV VIII Div 1	(1998) Boiler and Pressure Vessel Code; Section VIII, Pressure Vessels Division 1 - Basic Coverage

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

49 CFR 192	Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

CID A-A-2962	(Rev A) Enamel, Alkyd (Metric)

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS SP-25	(1998) Standard Marking System for Valves, Fittings, Flanges and Unions

NACE INTERNATIONAL (NACE)

NACE RP0185	(1996) Extruded, Polyolefin Resin Coating Systems with Soft Adhesives for Underground or Submerged Pipe
NACE RP0274	(1998) High Voltage Electrical Inspection of Pipeline Coatings Prior to Installation

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC Paint 25	(1991) Red Iron Oxide, Zinc Oxide, Raw Linseed Oil and Alkyd Primer (Without Lead and Chromate Pigments)
SSPC SP 1	(1982) Solvent Cleaning
SSPC SP 3	(1995) Power Tool Cleaning
SSPC SP 6/NACE 3	(1994) Commercial Blast Cleaning
SSPC SP 7/NACE 4	(1994) Brush-Off Blast Cleaning

UNDERWRITERS LABORATORIES (UL)

UL Gas&Oil Dir	(1999) Gas and Oil Equipment Directory

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

Pipe, Fittings, and Associated Materials; G-AO

Drawings shall contain complete schematic and piping 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 the system and appurtenances, and equipment relationship to other parts of the work including clearances for maintenance and operation.

SD-03 Product Data

Materials and Equipment; G-AO

A complete list of equipment and materials, including manufacturer's descriptive and technical literature, performance charts and curves, catalog cuts, and installation instructions, including, but not limited to the following:

a. Dielectric Unions and Flange Kits.

b. Meters.

c. Pressure Reducing Valves.

d. Regulators.

e. Earthquake Actuated Automatic Gas Shutoff System

Spare Parts Data; G-AO

Spare parts lists for each different item of material and

equipment specified, after approval of the detail drawings and not later than 2 months 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.

Connections to Existing Lines; G-AO

Notification of the Contractor's schedule for making connections to existing gas lines, at least 10 days in advance.

Jointing Polyethylene Piping; G-AO

A copy of qualified jointing procedures, training procedures, qualifications of trainer, and training test results for joiners and inspectors.

Connection Plan; G-AO

A copy of procedures for gas line tie in, hot taps, removal or demolition, purging, and plugging as applicable in accordance with ASME B31.8.

SD-07 Certificates

Utility Work; G-AO

Certification from the Operating Agency/Utility Company that work for which the Utility is responsible has been completed.

Training; G-AO

A copy of each inspector's and jointer's training certificate with respective test results.

SD-10 Operation and Maintenance Data

Gas Distribution System; G-AO

copies, in booklet form and indexed, of site specific natural gas operation and maintenance manual for each gas distribution system including system operation, system maintenance, equipment operation, and equipment maintenance manuals described below. If operation and maintenance manuals are provided in a common volume, they shall be clearly differentiated and separately indexed.

The System Operation Manual shall include but not be limited to the following:

a. Maps showing piping layout and locations of all system valves and gas line markers.

b. Step-by-step procedures required for system startup, operation, and shutdown. System components and equipment shall be indexed to the gas maps.

c. Isolation procedures and valve operations to shut down or isolate each section of the system. Valves and other system components shall be indexed to the gas maps.

d. Descriptions of Site Specific Standard Operation Procedures including permanent and temporary pipe repair procedures, system restart and test procedures for placing repaired lines back in service.

e. Descriptions of Emergency Procedures including: isolation procedures including required valve operations with valve locations indexed to gas map, recommended emergency equipment, checklist for major emergencies.

The Equipment Operation Manual shall include, but not be limited to, detail drawings, equipment data, and manufacturer supplied operation manuals for all equipment, valves and system components.

The System Maintenance Manuals shall include, but not be limited to:

a. Maintenance check list for entire gas distribution system.

b. Descriptions of site specific standard maintenance procedures.

c. Maintenance procedures for installed cathodic protection systems.

d. Piping layout, equipment layout, and control diagrams of the systems as installed.

e. Identification of pipe materials and manufacturer by location, pipe repair procedures, and jointing procedures at transitions to other piping materials or piping from different manufacturer.

The Equipment Maintenance Manuals shall include but not be limited to the following:

a. Identification of valves and other equipment by materials, manufacturer, vendor identification and location.

b. Maintenance procedures and recommended maintenance tool kits for all valves and equipment.

c. Recommended repair methods, either field repair, factory repair, or whole-item replacement for each valve component or piece of equipment or component item.

d. Routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guide.

1.3 GENERAL REQUIREMENTS

1.3.1 Not Used

1.3.2 Jointing Polyethylene Piping

Piping shall be joined by performance qualified joiners using qualified procedures in accordance with AGA Manual. 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 Manual. 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 Manual. The Contracting Officer shall be notified at least 24 hours in advance of the date to qualify joiners and inspectors.

1.3.3 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.

1.3.4 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.

1.3.5 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 Manual.

PART 2 PRODUCTS

2.1 PIPE, FITTINGS, AND ASSOCIATED MATERIALS

2.1.1 Steel Pipe

Steel pipe shall conform to ASTM A 53, Grade A or B, Type E or S, Schedule 40; or API Spec 5L seamless or electric resistance welded, Schedule 40, black steel pipe as specified in ASME B31.8. Furnace buttwelded pipe may be used in sizes 1-1/2 inches and smaller.

2.1.2 Small Fittings

Fittings 1-1/2 inches and smaller shall conform to ASME B16.11.

2.1.3 Fittings, 2 Inches and Larger

Pipe flanges and flanged fittings including bolts, nuts, and bolt patterns shall be in accordance with ASME B16.5, Class 150. Buttweld fittings shall be in accordance with ASME B16.9. Weld neck flanges shall be used.

2.1.4 Steel Forged Branch Connections

Connections shall conform to ASTM A 181/A 181M, Class 60, carbon steel.

2.1.5 Flange Gaskets

Gaskets shall be non-asbestos compressed material in accordance with ASME B16.21, 1/16 inch minimum thickness, full face or self-centering flat ring type. The gaskets shall contain aramid fibers bonded with nitrile butadiene rubber (NBR), or glass fibers bonded with polytetrafluoroethylene, suitable for maximum 600 degrees F service and meeting applicable requirements of ASME B31.8.

2.1.6 Pipe Threads

Pipe threads shall conform to ASME B1.20.1.

2.1.7 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 17 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.

2.1.8 Not Used

2.1.9 Sealants for Steel Pipe Threaded Joints

2.1.9.1 Sealing Compound

Joint sealing compound shall be as listed in UL Gas&Oil Dir, Class 20 or less.

2.1.9.2 Tape

Polytetrafluoroethylene tape shall conform to ASTM D 3308.

2.1.10 Identification

Pipe flow markings and metal tags for each valve, meter, and regulator shall be provided as required by the Contracting Officer.

2.1.11 Insulating Joint Materials

Insulating joint materials shall be provided between flanged or threaded metallic pipe systems where shown to isolate galvanic or electrolytic action.

2.1.11.1 Threaded Joints

Joints for threaded pipe shall be steel body nut type dielectric type unions with insulating gaskets.

2.1.11.2 Flanged Joints

Joints for flanged pipe shall consist of full face sandwich-type flange insulating gasket of the dielectric type, insulating sleeves for flange bolts and insulating washers for flange nuts.

2.1.12 Gas Transition Fittings

Gas transition fittings shall be manufactured steel fittings approved for jointing steel and polyethylene pipe. Approved transition fittings are those that conform to AGA Manual requirements for transition fittings.

2.2 VALVES

Valves shall be suitable for shutoff or isolation service and shall conform to the following:

2.2.1 Steel Valves

Steel valves 1-1/2 inches and smaller installed underground shall conform to ASME B16.34, carbon steel, socket weld ends, with square wrench operator adaptor. Steel valves 1-1/2 inches and smaller installed aboveground shall conform to ASME B16.34, carbon steel, socket weld or threaded ends with handwheel or wrench operator. Steel valves 2 inches and larger installed underground shall conform to API Spec 6D, carbon steel, buttweld ends, Class 150 with square wrench operator adaptor. Steel valves 2 inches and larger installed aboveground shall conform to API Spec 6D, carbon steel, buttweld or flanged ends, Class 150 with handwheel or wrench operator.

2.2.2 Steel Valve Operators

Valves 8 inches and larger shall be provided with worm or spur gear operators, totally enclosed, grease packed, and sealed. The operators shall have Open and Closed stops and position indicators. Locking feature shall be provided where indicated. Wherever the lubricant connections are not conveniently accessible, suitable extensions for the application of lubricant shall be provided. Valves shall be provided with lubricant compatible with gas service.

2.2.3 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 and vacuum protection, and shall be designed to meet the pressure, load and other service conditions.

2.3.1 Gas Main Regulators

Pressure regulators for main distribution lines, supplied from a source of gas which is at a higher pressure than the maximum allowable operating pressure for the system, and shall be equipped with pressure regulating devices of adequate capacity. In addition to the pressure regulating devices, a suitable method shall be provided to prevent overpressuring of the system in accordance with ASME B31.8. Suitable protective devices are as follows:

a. Spring-loaded relief valve meeting the provisions of ASME BPV VIII

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b. Pilot-loaded back pressure regulator used as relief valve, so designed that failure of the pilot system will cause the regulator to open.

c. Weight-loaded relief valves.

d. Monitoring regulator installed in series with the primary pressure regulator.

e. Series regulator installed upstream from the primary regulator, set to limit the pressure on the inlet of the primary regulator continuously to the maximum allowable operating pressure of the system, or less.

f. Automatic shutoff device installed in series with the primary regulator, set to shut off when the pressure on the distribution system reaches the maximum allowable operating pressure of the system, or less. This device shall remain closed until manually reset.

g. Spring-loaded, diaphragm type relief valves.

2.3.2 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. Regulators for liquified petroleum gas shall be adjusted to 10 to 12 inches of water column. Pressure relief for liquified petroleum gas shall be set at 16 inches of water column. 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 pedestal mounted and be provided with a strainer immediately upstream. Meters shall be provided with frost 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.

2.5 EARTHQUAKE ACTUATED AUTOMATIC GAS SHUTOFF SYSTEM

Earthquake Actuated Automatic Gas Shutoff devices shall be listed by the

State of California, Division of the State Architect as being tested and in conformance with specified requirements. The system shall safely interrupt the flow of gas to the building due to strong ground shaking of an earthquake. The valve shall be located upstream of the building isolation valve in the pressure regulator and meter assembly.

2.6 NOT USED

2.7 PROTECTIVE COVERING MATERIALS

Continuously extruded polyethylene and adhesive coating system materials shall conform to NACE RP0185, Type A.

PART 3 EXECUTION

3.1 EXCAVATION AND BACKFILLING

Earthwork shall be as specified in Section 02316a EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

3.2 GAS MAINS

Pipe for gas mains shall be steel or polyethylene as indicated on drawings. Steel pipe and fittings shall be coated with protective covering as specified. Polyethylene mains shall not be installed aboveground.

3.3 SERVICE LINES

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 except as permitted in ASME B31.8.

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 Underground Steel Pipe

Except as otherwise specified, protective coverings shall be applied mechanically in a factory or field plant especially equipped for the purpose. Valves and fittings that cannot be coated and wrapped

mechanically shall have the protective covering applied by hand, preferably at the plant that applies the covering to the pipe. Joints shall be coated and wrapped by hand. Hand coating and wrapping shall be done in a manner and with materials that will produce a covering equal in thickness to that of the covering applied mechanically.

3.5.1.1 Thermoplastic Resin Coating System

The coating system shall conform to NACE RP0185, Type A. The exterior of the pipe shall be cleaned to a commercial grade blast cleaning finish in accordance with SSPC SP 6/NACE 3. Adhesive compound shall be applied to the pipe. Immediately after the adhesive is applied, a seamless tube of polyethylene shall be extruded over the adhesive to produce a bonded seamless coating. The nominal thickness of the pipe coating system shall be 10 mils (plus or minus 10 percent) of adhesive and 40 mils (plus or minus 10 percent) of polyethylene for pipes up to 16 inches in diameter. For pipes 18 inches and larger in diameter, the pipe coating system thickness shall be 10 mils (plus or minus 10 percent) adhesive and 60 mils (plus or minus 10 percent) polyethylene. Joint coating and field repair material shall be applied as recommended by the coating manufacturer and shall be one of the following:

a. Heat shrinkable polyethylene sleeves.

b. Polyvinyl chloride pressure-sensitive adhesive tape.

c. High density polyethylene/bituminous rubber compound tape.

The coating system shall be inspected for holes, voids, cracks, and other damage during installation.

3.5.1.2 Inspection of Pipe Coatings

Any damage to the protective covering during transit and handling shall be repaired before installation. After field coating and wrapping has been applied, the entire pipe shall be inspected by an electric holiday detector with impressed current set at a value in accordance with NACE RP0274 using a full-ring, spring-type coil electrode. The holiday detector shall be equipped with a bell, buzzer, or other type of audible signal which sounds when a holiday is detected. All holidays in the protective covering shall be repaired immediately upon detection. The Contracting Officer reserves the right to inspect and determine the suitability of the detector. Labor, materials, and equipment necessary for conducting the inspection shall be furnished by the Contractor.

3.5.2 Protective Covering for Aboveground Piping Systems

Finish painting shall conform to the applicable paragraphs of Section 09900A PAINTING, GENERAL and as follows:

3.5.2.1 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/NACE 4 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 CID A-A-2962 Type I, Class A, Grade B.

3.5.2.2 Nonferrous Surfaces

Nonferrous surfaces shall not be painted. Nonferrous surfaces shall be painted due to corrosive conditions.

3.5.3 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 Manual and 49 CFR 192. 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. On steel pipe 6 inches and larger, an approved gas-cutting-and-beveling machine may be used. Cutting of plastic pipe shall be in accordance with AGA Manual. 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. Joints in steel pipe shall be welded except as otherwise permitted for installation of valves. 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 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 02316a EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITY SYSTEMS.

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 Threaded Steel Joints

Threaded joints in steel pipe shall have tapered threads evenly cut and shall be made with UL approved graphite joint sealing compound for gas service or polytetrafluoroethylene tape applied to the male threads only. Caulking of threaded joints to stop or prevent leaks will not be permitted.

3.7.2 Welded Steel Joints

Gas pipe weldments shall be as indicated. Changes in direction of piping shall be made with welding fittings only; mitering or notching pipe to form elbows and tees or other similar type construction will not be permitted. Branch connection may be made with either welding tees or forged branch outlet fittings. Branch outlet fittings shall be forged, flared for improvement of flow where attached to the run, and reinforced against external strains. Beveling, alignment, heat treatment, and inspection of weld shall conform to ASME B31.8. Weld defects shall be removed and repairs made to the weld, or the weld joints shall be entirely removed and rewelded. After filler metal has been removed from its original package, it shall be protected or stored so that its characteristics or welding properties are not affected adversely. Electrodes that have been wetted or have lost any of their coating shall not be used.

3.7.3 Polyethylene Pipe Jointing Procedures

Jointing procedures shall conform to AGA Manual. 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.

3.7.4 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 NOT USED

3.10 PRESSURE REGULATOR INSTALLATION

3.10.1 Not Used.

3.10.2 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.

3.11 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.

3.12 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.

3.12.1 Not Used

3.12.2 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 Plan shall be submitted and approved prior to making any connections to existing gas lines. This plan shall include the Operating Agency's required procedures which may be

obtained from the Contracting Officer. The Contractor shall notify the Contracting Officer, in writing, 10 days before connections to existing lines are to be made.

a. Not Used.
b. Not Used
c. Not Used.
d. Not Used.
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.

3.13 CATHODIC PROTECTION

Cathodic protection shall be provided for all metallic gas piping installed underground and shall be installed as specified in Section 13110A CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE).

3.14 TESTS

3.14.1 Not Used

3.14.2 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 50 psig. The test pressure is 50 psig. 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.

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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 457 mm (18-in) Drop
AASHTO T 193	(1993) The California Bearing Ratio
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/C 192M	(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 3203	Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D 3405	(1996) Joint Sealants, Hot-Applied, for Concrete and Asphalt Pavements
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/D 4867M	(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

CORPS OF ENGINEERS (COE) HAND BOOK FOR CONCRETE AND CEMENT

CRD-C 525	(1989) Corps of Engineers Test Method for Evaluation of Hot-Applied Joint Sealants for Bubbling Due to Heating

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,] [subbase 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 sieve or AASHTO T 180 if the material gradation contains more than 30 percent retained on the 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-A.

Proposed JMF.

Mixture Proportions; G-A.

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-A.

Certified copies of test results for approval not less than 20 days before material is required for the work.

Contractor Quality Control; G-A.

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-A.

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-A.

Copies of certified test data.

Bituminous Tack and Prime Coat; G-A.

Copies of certified test data.

SD-08 Manufacturer's Instructions

Manufacturer's Recommendations; G-A

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 01451 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, subbase 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 and subbase 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 Prime and 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.

1.8.4 Base Course, Subbase Course, Aggregate Surface Course

Construction of aggregate base course, subbase course, rigid pavement base course, and aggregate surface course shall be done when the atmospheric temperature is above 35 degrees F. When the temperature falls below 35 degrees F, the Contractor shall protect all completed areas by approved methods against detrimental effects of freezing. Completed areas damaged by freezing, rainfall, or other weather conditions shall be corrected to meet specified requirements.

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 [S] [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/D 4867M 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.

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 AND PRIME 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 Prime Coat

Bituminous prime coat shall conform to the requirements specified in Section 407, Prime Coat, Tack Coat, and Rejuvenating Agent", and Section 702, "BITUMINOUS MATERIALS", of the CDOT. Bituminous materials shall be liquid asphalt, designation MC-30, or MC-70 at the Contractor's option, except that only MC-30 shall be used on dense graded base courses if MC-70 does not adequately penetrate the base course material. In lieu of cut-back asphalt, the Contractor may use cationic emulsified asphalt, designation CSS-l or CSS-lh.

2.2.2 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[, except that the required 28-day field compressive strength strength shall be [5000 psi]. The coarse aggregate shall have a maximum nominal size of 1-1/2 inches. The maximum allowable slump of the concrete shall be 3 inchesfor 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. Hot-applied joint sealant shall conform to ASTM D 3405 and CRD-C 525.

2.7 AGGREGATE BASE COURSE (ABC)

Aggregate base course aggregate shall conform to the requirements specified in Section 304, "AGGREGATE BASE COURSE" and Section 703.03 "AGGREGATE FOR BASES", of the CDOT, except as modified herein. Aggregate base course shall be CDOT Class 4 except as otherwise specified herein. The portion retained on the No. 4 sieve shall be known as coarse aggregate; that portion passing the No. 4 sieve shall be known as fine aggregate. Aggregates shall be angular particles of uniform density. Coarse aggregate shall be crushed gravel, crushed stone, crushed recycled concrete, or crushed slag. Fine aggregate shall consist of screenings, angular sand, crushed recycled concrete fines, or other finely divided mineral matter processed or naturally combined with the coarse aggregate. The amount of flat and elongated particles shall not exceed 30 percent. A flat particle is one having a ratio of width to thickness greater than 3; an elongated particle is one having a ratio of length to width greater than 3. In the portion retained on each sieve specified, the crushed aggregates shall contain at least 50 percent by weight of crushed pieces having two or more freshly fractured faces with the area of each face being at least equal to 75 percent of the smallest midsectional area of the piece. When two fractures are contiguous, the angle between planes of the fractures must be at least 30 degrees in order to count as two fractured faces. Crushed gravel shall be manufactured from gravel particles 50 percent of which, by weight, are retained on the maximum size sieve. The percentage of loss shall not exceed 18 after 5 cycles when performed in accordance with ASTM C 88, using magnesium sulfate. The portion of the material passing the No. 40 sieve shall have liquid limit not greater than 25 and a plasticity index not greater than 5. When tested for gradation, the percentage passing the No. 200 sieve shall not exceed 10 percent and the 0.02 mm sieve shall not exceed 3.0 percent.

2.8 RIGID PAVEMENT BASE COURSE

Rigid pavement base course aggregate shall conform to the requirements specified in Section 304, "AGGREGATE BASE COURSE" and Section 703.03 "AGGREGATE FOR BASES", of the CDOT, except as modified herein. Rigid pavement base course shall be CDOT Class 5 except as otherwise specified herein. The aggregate shall meet the following additional properties; the aggregate shall be a crushed quarry rock, [crushed gravel, crushed screenings, sand or a combination thereof]. The percentage of loss shall not exceed 18 after 5 cycles when performed in accordance with ASTM C 88, using magnesium sulfate. The portion of the material passing the No. 40 sieve shall have liquid limit not greater than 25 and a plasticity index not greater than 5. When tested for gradation, the percentage passing the No. 200 sieve shall be between 9 percent and 15 percent. The 0.02 mm sieve shall not exceed 6.0 percent.

2.9 SUBBASE COURSE

Subbase course aggregate shall conform to the requirements specified in Section 304, "AGGREGATE BASE COURSE" and Section 703.03 "AGGREGATE FOR BASES", of the CDOT, except as modified herein. Subbase courses shall be CDOT Class 5 except as otherwise specified herein. The aggregate shall meet the following additional properties; the aggregate shall be a crushed quarry rock, [crushed gravel, crushed screenings, sand or a combination thereof]. The subbase course shall have a minimum California Bearing Ratio (CBR) of 50. The CBR shall be determined in accordance with AASHTO T l93. The percentage of loss shall not exceed 18 after 5 cycles when performed in accordance with ASTM C 88, using magnesium sulfate. The portion of the material passing the No. 40 sieve shall have liquid limit not greater than 25 and a plasticity index not greater than 5. When tested for gradation, the percentage passing the No. 200 sieve shall be between 9 percent and 15 percent. The 0.02 mm sieve shall not exceed 6.0 percent.

2.10 AGGREGATE SURFACE COURSE

Crushed aggregate surface course aggregate shall conform to the requirements specified in Section 304, "AGGREGATE BASE COURSE" and Section 703.03 "AGGREGATE FOR BASES", of the CDOT, except as modified herein. Aggregates shall consist of crushed stone or slag, crushed or natural gravel, sand, or other sound, durable materials processed and blended or naturally combined. Aggregates shall be durable and sound, free from lumps and balls of clay, organic matter, objectionable coatings, and other foreign material. The aggregate shall meet the gradation requirement for Class 7. The amount of flat and elongated particles shall not exceed 20 percent. A flat particle is one having a ratio of width to thickness greater than 3; an elongated particle is one having a ratio of length to width greater than 3. The aggregate for the surface course shall contain a minimum 80 percent crushed material. The portion of the material passing the No. 40 sieve shall have a liquid limit not greater than 35 and a plasticity index of 4 to 9.

2.11 INITIAL TESTS

One of each of the following tests shall be performed on the proposed aggregate base course, rigid pavement base course, subbase course and aggregate surface course material prior to commencing construction to demonstrate that the proposed material meets all specified requirements when furnished. If materials from more than one source are going to be utilized, this testing shall be completed for each source.

a. Sieve Analysis including 0.02 mm size material.

b. Liquid limit and plasticity index moisture-density relationship.

c. Moisture-density relationship.

d. Wear.

e. Soundness.

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 [and as shown on the drawings]. 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] [at the disposal area indicated on the drawings].

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] [75] 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 feet or 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 AND PRIME COAT

Except as otherwise specified herein, application of bituminous tack and prime 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.

3.3.2 Bituminous Prime Coat

A prime coat will be required if it will be at least seven days before a the surfacing (Asphalt cement hot mix concrete)layer is constructed on the underlying (base course, etc) compacted material. The type of liquid asphalt and application rate will be as specified herein. The Contractor shall protect the underlying from any damage (water, traffic, etc.) until the surfacing is placed. If the Contractor places the surfacing within seven days, the choice of protection measures or actions to be taken is at the Contractor's option. Damage to the underlying material caused by lack of, or inadequate, protection shall be repaired (recompacted or replaced) by approved methods at no additional cost to the Government. If the Contractor options to use the prime coat, it shall be applied as soon as possible after consolidation of the underlying material. Rate of application shall be not less than 0.15 gallon nor more than 0.40 gallon per square yard. To obtain uniform application of the prime coat on the surface treated at the junction of previous and subsequent applications, building paper shall be spread on the surface for a sufficient distance back from the ends of each application to start and stop the prime coat on the paper. Immediately after application, the building paper shall be removed and destroyed. Prime coat shall be allowed to cure without being disturbed for a period of at least 48 hours or longer, as may be necessary to attain penetration into the treated course.

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/C 192M, 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.] [For pavements greater than 8 inches in thickness, when any core shows a deficiency in thickness greater than 1/2 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] [Section 02210 GRADING]. 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 inch thick 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.

3.6 AGGREGATE COURSES

Aggregate base course, subbase course, rigid pavement base course, and aggregate surface course shall conform to, and be constructed in accordance with, the requirements specified in Section 304, "AGGREGATE BASE COURSE" and Section 703.03, "AGGREGATE FOR BASES" of the CDOT, except as modified herein. The aggregate base course, subbase course, rigid pavement base course, and aggregate surface course shall be compacted to 100 percent of laboratory maximum density.

3.6.1 Acceptability of Work

The aggregate base course, subbase course, rigid pavement base course, and aggregate surface course will be accepted on the basis of tests made by the Contractor as specified herein. The Government may, at its discretion, make check tests to validate the results of the Contractor's testing.

3.6.1.1 In-Place Tests

One of each of the following tests shall be performed on samples taken from the placed and compacted aggregate course. Samples shall be taken and tested at the rates indicated for each layer of material placed.

a. Density tests shall be performed on every lift of material placed and at a frequency of one set of tests for every 250 square yards, or portion thereof, of completed area.

b. Sieve Analysis [including No. 635 size material] shall be performed on every lift of material placed and at a frequency of one test for every 1000 square meters, or portion thereof, of completed area for every 500 tons, or portion thereof, of material placed.

c. Liquid limit and plasticity index tests shall be performed at the same frequency as the sieve analysis.

3.6.1.2 Thickness

The total compacted thickness of the aggregate course shall be within 1/2 inch of the thickness indicated. Where the measured thickness is more than 1/2 inch deficient, such areas shall be corrected by scarifying, adding new material of proper gradation, reblading, and recompacting as directed. Where the measured thickness is more than 1/2 inch thicker than indicated, the course shall be considered as conforming to the specified thickness requirements. Average job thickness shall be the average of all thickness

measurements taken for the job, but shall be within 1/4 inch of the thickness indicated. The total thickness of the aggregate course shall be measured at intervals in such a manner as to ensure one measurement for each 500 square yards of aggregate course. Measurements shall be made in 3 inch diameter test holes penetrating the aggregate course.

3.6.1.3 Smoothness

The surface of the top layer shall show no deviations in excess of 3/8 inch when tested with a 10 foot straightedge applied parallel with and at right angles to the centerline of the area to be paved. Measurements shall be taken in successive positions parallel to the centerline of the area to be paved. Measurements shall also be taken perpendicular to the centerline at 50 foot intervals. Deviations exceeding this amount shall be corrected by removing material and replacing with new material, or by reworking existing material and compacting it to meet these specifications.

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13286N

HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBs AND MERCURY

01/01

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13286N

HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBs AND MERCURY
01/01

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)

29 CFR 1910.1000	Air Contaminants
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Generators of Hazardous Waste
40 CFR 263	Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal FacilitiesRef Title
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Program
40 CFR 273	Standards For Universal Waste Management
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use ProhibitionsRef Title
49 CFR 178	Shipping Container Specification

STATE OF COLORADO ADMINISTRATIVE CODE

Hazardous Waste Regulations

Solid Waste Management Regulations

1.2 REQUIREMENTS

Removal and disposal of PCB containing lighting ballasts and associated

mercury-containing lamps. Contractor may encounter leaking PCB ballasts.

1.3 DEFINITIONS

1.3.1 Certified Industrial Hygienist (CIH)

A industrial hygienist hired by the contractor shall be certified by the American Board of Industrial Hygiene.

1.3.2 Leak

Leak or leaking means any instance in which a PCB article, PCB container, or PCB equipment has any PCBs on any portion of its external surface.

1.3.3 Lamps

Lamp, also referred to as "universal waste lamp", is defined as the bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the ultraviolet, visible, and infra-red regions of the electromagnetic spectrum. Examples of common universal waste electric lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps.

1.3.4 Polychlorinated Biphenyls (PCBs)

PCBs as used in this specification shall mean the same as PCBs, PCB containing lighting ballast, and PCB container, as defined in 40 CFR 761, Section 3, Definitions.

1.3.5 Spill

Spill means both intentional and unintentional spills, leaks, and other uncontrolled discharges when the release results in any quantity of PCBs running off or about to run off the external surface of the equipment or other PCB source, as well as the contamination resulting from those releases.

1.3.6 Universal Waste

Universal Waste means any of the following hazardous wastes that are managed under the universal waste requirements 40 CFR 273:

(1) Batteries as described in Sec. 273.2 of this chapter;
(2) Pesticides as described in Sec. 273.3 of this chapter;
(3) Thermostats as described in Sec. 273.4 of this chapter; and
(4) Lamps as described in Sec. 273.5 of this chapter.

1.4 QUALITY ASSURANCE

1.4.1 Regulatory Requirements

Perform PCB related work in accordance with 40 CFR 761. Perform mercury-containing lamps storage and transport in accordance with 40 CFR 261, 40 CFR 264, 40 CFR 265, 40 CFR 273.

1.4.2 Training

Certified industrial hygienist (CIH) shall instruct and certify the training of all persons involved in the removal of PCB containing lighting

ballasts and mercury-containing lamps. The instruction shall include: The dangers of PCB and mercury exposure, decontamination, safe work practices, and applicable OSHA and EPA regulations. The CIH shall review and approve the PCB and Mercury-Containing Lamp Removal Work Plans.

1.4.3 Regulation Documents

Maintain at all times one copy each at the office and one copy each in view at the job site of 29 CFR 1910.1000, 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 265, 40 CFR 268, 40 CFR 270, 40 CFR 273 and of the Contractor removal work plan and disposal plan for PCB and for associated mercury-containing lamps.

1.5 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-07 Certificates

Qualifications of CIH; G-RE

Training Certification; G-RE

PCB and Lamp Removal Work Plan; G-RE

PCB and Lamp Disposal Plan; G-RE

SD-11 Closeout Submittals

Transporter certification of notification to EPA of their PCB waste activities and EPA ID numbers; G-RE

Certification of Decontamination

Certificate of Disposal and/or recycling. Submit to the Government before application for payment within 30 days of the date that the disposal of the PCB and mercury-containing lamp waste identified on the manifest was completed.

DD Form 1348-1

Testing results

1.6 ENVIRONMENTAL REQUIREMENTS

Use special clothing:

a. Disposable gloves (polyethylene)

b. Eye protection

c. PPE as required by CIH

1.7 SCHEDULING

Notify the Contracting Officer 20 days prior to the start of PCB and mercury-containing lamp removal work.

1.8 QUALITY ASSURANCE

1.8.1 Qualifications of CIH

Submit the name, address, and telephone number of the Industrial Hygienist selected to perform the duties in paragraph entitled "Certified Industrial Hygienist." Submit training certification that the Industrial Hygienist is certified, including certification number and date of certification or re certification.

1.8.2 PCB and Lamp Removal Work Plan

Submit a job-specific plan within 20 calendar days after award of contract of the work procedures to be used in the removal, packaging, and storage of PCB-containing lighting ballasts and associated mercury-containing lamps. Include in the plan: Requirements for Personal Protective Equipment (PPE), spill cleanup procedures and equipment, eating, smoking and restroom procedures. The plan shall be approved and signed by the Certified Industrial Hygienist. Obtain approval of the plan by the Contracting Officer prior to the start of PCB and/or lamp removal work.

1.8.3 PCB and Lamp Disposal Plan

Submit a PCB and lamp Disposal Plan with 45 calendar days after award of contract. The PCB and Lamp Disposal Plan shall comply with applicable requirements of federal, state, and local PCB and Universal waste regulations and address:

a. Estimated quantities of wastes to be generated, disposed of, and recycled.

b. Names and qualifications of each Contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location. Furnish two copies of EPA and state PCB and mercury-containing lamp waste permit applications and EPA identification numbers, as required.

c. Names and qualifications (experience and training) of personnel who will be working on-site with PCB and mercury-containing lamp wastes.

d. Spill prevention, containment, and cleanup contingency measures to be implemented.

e. Work plan and schedule for PCB and mercury-containing lamp waste removal, containment, storage, transportation, disposal and or recycling. Wastes shall be cleaned up and containerize daily.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 WORK PROCEDURE

Furnish labor, materials, services, and equipment necessary for the removal of PCB containing lighting ballasts, associated mercury-containing fluorescent lamps, in accordance with local, state, or federal regulations.

Do not expose PCBs to open flames or other high temperature sources since toxic decomposition by-products may be produced. Do not brake mercury containing fluorescent lamps or high intensity discharge lamps.

3.1.1 Work Operations

Ensure that work operations or processes involving PCB or PCB-contaminated materials are conducted in accordance with 40 CFR 761, 40 CFR 262 40 CFR 263, and the applicable requirements of this section, including but not limited to:

a. Obtaining suitable PCB and mercury-containing lamp storage sites.

b. Notifying Contracting Officer prior to commencing the operation.

c. Reporting leaks and spills to the Contracting Officer.

d. Cleaning up spills.

e. Inspecting PCB and PCB-contaminated items and waste containers for leaks and forwarding copies of inspection reports to the Contracting Officer.

f. Maintaining inspection, inventory and spill records.

3.2 PCB SPILL CLEANUP REQUIREMENTS

3.2.1 PCB Spills

Immediately report to the Contracting Officer any PCB spills.

3.2.2 PCB Spill Control Area

Rope off an area around the edges of a PCB leak or spill and post a "PCB Spill Authorized Personnel Only" caution sign. Immediately transfer leaking items to a drip pan or other container.

3.2.3 PCB Spill Cleanup

40 CFR 761, subpart G. Initiate cleanup of spills as soon as possible, but no later than 24 hours of its discovery. Mop up the liquid with rags or other conventional absorbent. The spent absorbent shall be properly contained and disposed of as solid PCB waste.

3.2.4 Records and Certification

Document the cleanup with records of decontamination in accordance with 40 CFR 761, Section 125, Requirements for PCB Spill Cleanup. Provide test results of cleanup and certification of decontamination.

3.3 REMOVAL

3.3.1 Ballasts

As ballast are removed from the lighting fixture, inspect label on ballast. Ballasts without a "No PCB" label shall be assumed to contain PCBs and containerized and disposed of as required under paragraphs STORAGE FOR DISPOSAL and DISPOSAL. If there are less than 1600 "No PCB" labeled lighting ballasts dispose of them as normal demolition debris. If there

are more than 1600 "No PCB" labeled ballasts, establish whether the "No PCB" labeled ballasts contain diethylhexyl phthalate (DEHP) either by test or by checking with the ballast manufacturer indicated on the label. Submit testing results and/or written confirmation from the manufacturer to the Contracting Officer. If the ballasts do not contain DEHP, dispose of them as normal construction debris. If they do contain DEHP, dispose of them as hazardous material in accordance with Federal, State, and local regulations. As a basis of bid assume ballasts with "No PCB" labels do not contain DEHP and may disposed of as normal construction debris. If 1600 or more DEHP ballasts are disposed of in a 24 hour period, notify the National Response Team at 800-424-8802.

3.3.2 Lighting Lamps

Remove lighting tubes/lamps from the lighting fixture and carefully place (unbroken) into appropriate containers (original transport boxes or equivalent). In the event of a lighting tube/lamp braking, sweep and place waste in double plastic taped bags and dispose of as universal waste as specified herein.

3.4 STORAGE FOR DISPOSAL

3.4.1 Storage Containers for PCBs

49 CFR 178. Store PCB in containers approved by DOT for PCB.

3.4.2 Storage Containers for lamps

Store mercury containing lamps in appropriate DOT containers. The boxes shall be stored and labeled for transport in accordance with 40 CFR 273.

3.4.3 Labeling of Waste Containers

Label with the following:

a. Date the item was placed in storage and the name of the cognizant activity/building.

b. "Caution Contains PCB," conforming to 40 CFR 761, CFR Subpart C. Affix labels to PCB waste containers.

c. Label mercury-containing lamp waste in accordance with 40 CFR 273. Affix labels to all lighting waste containers.

3.5 DISPOSAL

Dispose of off Government property in accordance with EPA, DOT, and local regulations at a permitted site.

3.5.1 Identification Number

Federal regulations 40 CFR 761, and 40 CFR 263 require that generators, transporters, commercial storers, and disposers of PCB waste posses U.S. EPA identification numbers. The contractor shall verify that the activity has a U.S. EPA generator identification number for use on the Uniform Hazardous Waste manifest. If not, the contractor shall advise the activity that it must file and obtain an I.D. number with EPA prior to commencement of removal work. For mercury containing lamp removal, Federal regulations 40 CFR 273 require that large quantity handlers of Universal waste (LQHUW)

must provide notification of universal waste management to the appropriate EPA Region (or state director in authorized states), obtain an EPA identification number, and retain for three years records of off-site shipments of universal waste. The contractor shall verify that the activity has a U.S. EPA generator identification number for use on the Universal Waste manifest. If not, the contractor shall advise the activity that it must file and obtain an I.D. number with EPA prior to commencement of removal work.

3.5.2 Transporter Certification

Comply with disposal and transportation requirements outlined in 40 CFR 761 and 40 CFR 263. Before transporting the PCB waste, sign and date the manifest acknowledging acceptance of the PCB waste from the Government. Return a signed copy to the Government before leaving the job site. Ensure that the manifest accompanies the PCB waste at all times. Submit transporter certification of notification to EPA of their PCB waste activities (EPA Form 7710-53).

3.5.2.1 Certificate of Disposal and/or Recycling

40 CFR 761. Certificate for the PCBs and PCB items disposed shall include:

a. The identity of the disposal and or recycling facility, by name, address, and EPA identification number.

b. The identity of the PCB waste affected by the Certificate of Disposal including reference to the manifest number for the shipment.

c. A statement certifying the fact of disposal and or recycling of the identified PCB waste, including the date(s) of disposal, and identifying the disposal process used.

d. A certification as defined in 40 CFR 761.

3.5.3 NOT USED

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SECTION 15951A

DIRECT DIGITAL CONTROL FOR HVAC
06/98

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.

AIR MOVEMENT AND CONTROL ASSOCIATION (AMCA)

AMCA Std 500	(11989; Rev994) Test Methods for Louvers, Dampers and Shutters

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C12.1	(1995) Code for Electricity Metering

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASME INTERNATIONAL (ASME)

ASME B40.1	(1991) Gauges - Pressure Indicating Dial Type - Elastic Element

ELECTRONIC INDUSTRIES ALLIANCE (EIA)

EIA ANSI/EIA/TIA 232-F	(1991) Interface Between Data Technical Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C62.41	(1991; R 1995) Surge Voltages in Low-Voltage AC Power Circuits
IEEE Std 142	(1991) IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA 250	(1997) Enclosures for Electrical Equipment (1000 Volts Maximum)
NEMA ICS 1	(1993) Industrial Control and Systems
NEMA ST 1	(1988) Specialty Transformers (Except

	General-Purpose Type)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(1999) National Electrical Code
NFPA 90A	(1999) Installation of Air Conditioning and Ventilating Systems

UNDERWRITERS LABORATORIES (UL)

UL 268A	(1998) Smoke Detectors for Duct Application
UL 508	(1999) Industrial Control Equipment
UL 555S	(1996) Leakage Rated Dampers for Use in Smoke Control Systems

1.2 GENERAL REQUIREMENTS

The direct digital control (DDC) shall be a complete system suitable for the heating, ventilating and air-conditioning (HVAC) system.

Standard Products

Material and equipment shall be the standard products of Williams Electric Company, Inc. (WEC)temperature controls and Utility Control System (UCS) and each component shall provide the discrete functions specified. Combining of components or discrete component functions by using multiple function devices which have not been specified, and deviation from indicated logic shall not be permitted. Items of equipment (individual control system components such as pressure sensors, controllers, temperature probes) shall essentially duplicate equipment that has been in satisfactory use at least 2 years prior to bid opening. All equipment, including installation materials, shall conform to the requirements of the Buy American Act or shall be of American manufacture and assembly. Specific acceptable items of foreign manufacture are identified herein. Any equipment or material which does not meet these requirement shall be subject to removal and replacement at no additional cost to the Government.

Identical Items

Items of equipment that perform the same function shall be identical, including equipment, assemblies, parts, and components.

Configuration

The Contractor shall configure the Direct Digital Control (DDC) system as described. System shall be listed per UL 916. Direct Digital Control panels shall be fully capable of controlling their respective systems with or without communication with any host computer system. The system shall provide operator interaction through the existing Williams Electric Company, Inc. temperature controls and UCS Central Operator System (COS) workstation. DDC panels shall manage all control functions within their data environment as specified. Every connected analog output (AO), analog input (AI), Binary output (BO), and Binary input (BI), represents a point

where referred to in this specification.

Connection to Base-Wide EMCS System

The contractor shall be responsible for connection and integration of the Direct Digital Control (DDC) system to the existing base-wide Williams Electric Company, Inc. temperature controls and UCS Energy Management and Control System (EMCS). This includes providing all equipment, cabling, software, programming, installation, commissioning, and training unless noted otherwise.

Database Definition and Graphic Generation

Contractor shall generate required database definitions compatible with the existing EMCS databases. They shall also generate complete and accurate dynamic graphics representations of each air handling unit system and all other systems shall be identified on I/O summary charts as well as complete building floor plans showing individual space sensed and set point temperature and humidity conditions.

Sole Source Requirement

Notwithstanding Section 00700 Contract Clauses FAR 52.236-5, Material and Workmanship, DDC controllers, DDC/EMCS shall be manufactured by Williams Electric Company, Inc. in order that the systems installed are Williams Electric Company, Inc. temperature controls and UCS , and fully integrated and connected to the Base Williams Electric Company, Inc. temperature controls and UCS EMCS System. No other product will be acceptable. The Competition Advocate authorizes sole source procurement

1.2.1 Nameplates, Lens Caps, and Tags

Nameplates and lens caps bearing legends as shown and tags bearing device-unique identifiers as shown shall have engraved or stamped characters. A plastic or metal tag shall be mechanically attached directly to each device or attached by a metal chain or wire. Each airflow measurement station shall have a tag showing flow rate range for signal output range, duct size, and identifier as shown.

1.2.2 Verification of Dimensions

After becoming familiar with all details of the work, the Contractor shall verify all dimensions in the field, and shall advise the Contracting Officer of any discrepancy before performing any work.

1.2.3 Drawings

Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings, and accessories that may be required. The Contractor shall carefully investigate the mechanical, electrical, and finish conditions that could affect the work to be performed, shall arrange such work accordingly, and shall furnish all work necessary to meet such conditions.

1.2.4 Power-Line Surge Protection

Equipment connected to ac circuits shall be protected from power-line surges. Equipment protection shall meet the requirements of IEEE C62.41. Fuses shall not be used for surge protection.

1.2.5 Surge Protection for Transmitter and Control Wiring

DDC system control-panel equipment shall be protected against surges induced on control and transmitter wiring installed outside and as shown. The equipment protection shall be tested in the normal mode and in the common mode, using the following two waveforms:

a. A 10-microsecond by 1,000-microsecond waveform with a peak voltage of 1,500 volts and a peak current of 60 amperes.

b. An eight microsecond by 20-microsecond waveform with a peak voltage of 1,000 volts and a peak current of 500 amperes.

1.2.6 System Overall Reliability Requirement

The system shall be configured and installed to yield a mean time between failure (MTBF) of at least 40,000 hours. Each DDC controller shall be designed, configured, installed and programmed to provide for stand alone operation with minimal performance degradation on failure of other system components to which it is connected or with which it communicates.

1.2.7 DDC System Network Accessibility

Where the systems to be controlled by the DDC system are located in multiple mechanical rooms, each mechanical room shall have at least one communication port for the portable workstation/tester. DDC controllers shall be located in the same room as the equipment being controlled or in an adjacent space which has direct access to the equipment room.

1.2.8 System Accuracy and Display

The system shall maintain an end-to-end accuracy for one year from sensor to operator's console display for the applications specified and shall display the value as specified. Each temperature shall be displayed and printed to nearest 0.1 degree F.

1.2.8.1 Space Temperature

Space temperature with a range of 50 to 85 degrees F plus or minus 0.75 degree F for conditioned space; 30 to 130 degrees F plus or minus 1 degree F for unconditioned space.

1.2.8.2 Duct Temperature

Duct temperature with a range of 40 to 140 degrees F plus or minus 2 degrees F.

1.2.8.3 Outside Air Temperature

Outside air (OA) temperature with a range of minus 30 to plus 130 degrees F plus or minus 2 degrees F; with a subrange of 30 to 100 degrees F plus or minus 1 degree F.

1.2.8.4 Water Temperature

Water temperature with a range of 30 to 100 degrees F plus or minus 0.75 degree F; the range of 100 to 250 degrees F plus or minus 2 degrees F; and water temperatures for the purpose of performing Btu calculations using differential temperatures to plus or minus 0.5 degree F using matched sensors.

1.2.8.5 High Temperature - Not Used

1.2.8.6 Relative Humidity

Relative humidity, within a range of 20 to 80 percent, plus or minus 6.0 percent of range (display and print to nearest 1.0 percent).

1.2.8.7 Pressure

Pressure with a range for the specific application plus or minus 2.0 percent of range (display and print to nearest psi.)

1.2.8.8 Flow

Flow with a range for the specific application plus or minus 3.0 percent of range, and flows for the purpose of thermal calculations to plus or minus 2.0 percent of actual flow (display and print to nearest unit, such as gallons per minute).

1.2.8.9 KWh and kW Demand

KWh and kW demand with a range for the specific application plus or minus 1.0 percent of reading (display and print to nearest kWh or kW).

1.2.8.10 Analog Value Input

An analog value input to the system's equipment via an AI with a maximum error of 0.50 percent of range, not including the sensor or transmitter error. This accuracy shall be maintained over the specified environmental conditions.

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

HVAC Control System; G-DO

Drawings shall be on 34 by 22 inch sheets in the form and arrangement shown. The drawings shall use the same abbreviations, symbols, nomenclature and identifiers shown. Each control system element on a drawing shall have a unique identifier as shown. The HVAC Control System Drawings shall be delivered together as a complete submittal. Deviations must be approved by the Contracting Officer. Drawings shall be submitted along with Submittal SD-01, Data.

a. HVAC Control System Drawings shall include the following:

Sheet One: Drawing Index, HVAC Control System Legend.

Sheet Two: Valve Schedule, Damper Schedule.

Sheet Three: Not Used.

Sheet Four: Control System Schematic and Equipment Schedule.

Sheet Five: Sequence of Operation and Data Terminal Strip Layout.

Sheet Six: Control Loop Wiring Diagrams.

Sheet Seven: Motor Starter and Relay Wiring Diagram.

Sheet Eight: Communication Network and Block Diagram.

Sheet Nine: DDC Panel Installation and Block Diagram.

(Repeat Sheets Four through Seven for each AHU System.)

b. The HVAC Control System Drawing Index shall show the name and number of the building, military site, State or other similar designation, and Country. The Drawing Index shall list HVAC Control System Drawings, including the drawing number, sheet number, drawing title, and computer filename when used. The HVAC Control System Legend shall show generic symbols and the name of devices shown on the HVAC Control System Drawings.

c. The valve schedule shall include each valve's unique identifier, size, flow coefficient Cv, pressure drop at specified flow rate, spring range, actuator size, close-off pressure data, dimensions, and access and clearance requirements data. Valve schedules may be submitted in advance but shall be included in the complete submittal.

d. The damper schedule shall contain each damper's and each actuator's identifier, nominal and actual sizes, orientation of axis and frame, direction of blade rotation, spring ranges, operation rate, locations of actuators and damper end switches, arrangement of sections in multi-section dampers, and methods of connecting dampers, actuators, and linkages. The Damper Schedule shall include the maximum leakage rate at the operating static-pressure differential. The Damper Schedule shall contain actuator selection data supported by calculations of the torque required to move and seal the dampers, access and clearance requirements. Damper schedules may be submitted in advance but shall be included in the complete submittal.

e. Not Used.

f. The HVAC control system schematics shall be in the form shown, and shall show all control and mechanical devices associated with the HVAC system. A system schematic drawing shall be submitted for each HVAC system.

g. The HVAC control system equipment Schedule shall be in the

form shown. All devices shown on the drawings having unique identifiers shall be referenced in the equipment schedule. Information to be included in the equipment schedule shall be the control loop, device unique identifier, device function, setpoint, input range, and additional important parameters (i.e., output range). An equipment schedule shall be submitted for each HVAC system.

h. The HVAC control system sequence of operation shall reflect the language and format of this specification, and shall refer to the devices by their unique identifiers as shown. No operational deviations from specified sequences will be permitted without prior written approval of the Contracting Officer. Sequences of operation shall be submitted for each HVAC control system including each type of terminal unit control system.

i. The HVAC control system wiring diagrams shall be functional wiring diagrams which show the interconnection of conductors and cables to HVAC control panel terminal blocks and to the identified terminals of devices, starters and package equipment. The wiring diagrams shall show necessary jumpers and ground connections. The wiring diagrams shall show the labels of all conductors. Sources of power required for HVAC control systems and for packaged equipment control systems shall be identified back to the panel board circuit breaker number, HVAC system control panel, magnetic starter, or packaged equipment control circuit. Each power supply and transformer not integral to a controller, starter, or packaged equipment shall be shown. The connected volt-ampere load and the power supply volt-ampere rating shall be shown. Wiring diagrams shall be submitted for each HVAC control system.

SD-03 Product Data

Service Organizations; G-DO

Six copies of a list of service organizations qualified to service the HVAC control system. The list shall include the service organization name, address, technical point of contact and telephone number, and contractual point of contact and telephone number.

Equipment Compliance Booklet; G-DO

The HVAC Control System Equipment Compliance Booklet (ECB) shall be in booklet form and indexed, with numbered tabs separating the information on each device. It shall consist of, but not be limited to, data sheets and catalog cuts which document compliance of all devices and components with the specifications. The ECB shall be indexed in alphabetical order by the unique identifiers. Devices and components which do not have unique identifiers shall follow the devices and components with unique identifiers and shall be indexed in alphabetical order according to their functional name. The ECB shall include a Bill of Materials for each HVAC Control System. The Bill of Materials shall function as the Table of Contents for the ECB and shall include the device's unique identifier, device function, manufacturer, model/part/catalog number used for ordering, and tab number where the device information is located in the ECB. The ECB shall be submitted along with Submittal SD-04, Drawings.

Performance Verification Test Procedures; G-AO

Six copies of the HVAC Control System Performance Verification Test Procedures, in booklet form and indexed, 60 days before the Contractor's scheduled test dates. The performance verification test procedures shall refer to the devices by their unique identifiers as shown, shall explain, step-by-step, the actions and expected results that will demonstrate that the HVAC control system performs in accordance with the sequences of operation, and other contract documents. An HVAC control system performance verification test equipment list shall be included that lists the equipment to be used during performance verification testing. The list shall include manufacturer name, model number, equipment function, the date of the latest calibration, and the results of the latest calibration.

Training; G-AO

An outline for the HVAC control system training course with a proposed time schedule. Approval of the planned training schedule shall be obtained from the Government at least 60 days prior to the start of the training. Six copies of HVAC control system training course material 30 days prior to the scheduled start of the training course. The training course material shall include the operation manual, maintenance and repair manual, and paper copies of overheads used in the course.

SD-06 Test Reports

Performance Verification Test; G-AO

Six copies of the HVAC Control System Performance Verification Test Report, in booklet form and indexed, within 30 days after completion of the test. The HVAC control system performance verification test report shall include data collected during the HVAC control system performance verification test. The original copies of all data gathered during the performance verification test shall be turned over to the Government after Government approval of the test results.

SD-10 Operation and Maintenance Data

Operation Manual; G-AO
Maintenance and Repair Manual; G-AO

Six copies of the HVAC Control System Operation Manual and HVAC Control System Maintenance and Repair Manual, for each HVAC control system, 30 days before the date scheduled for the training course.

1.4 DELIVERY AND STORAGE

Products shall be stored with protection from the weather, humidity and

temperature variations, dirt and dust, and other contaminants, within the storage condition limits published by the equipment manufacturer. Dampers shall be stored so that seal integrity, blade alignment and frame alignment are maintained.

1.5 OPERATION MANUAL

An HVAC control system operation manual in indexed booklet form shall be provided for each HVAC control system. The operation manual shall include the HVAC control system sequence of operation, and procedures for the HVAC system start-up, operation and shut-down. The operation manual shall include as-built HVAC control system detail drawings. The operation manual shall include the as-built configuration checksheets, the procedures for changing HVAC control system setpoints, and the procedures for placing HVAC system controllers in the manual control mode.

a. The procedures for changing HVAC control system setpoints shall describe the step-by-step procedures required to change the process variable setpoints, the alarm setpoints, the bias settings, and setpoint reset schedules.

b. The procedures for placing HVAC system controllers in the manual control mode shall describe step-by-step procedures required to obtain manual control of each controlled device and to manually adjust their positions.

1.6 MAINTENANCE AND REPAIR MANUAL

An HVAC control system maintenance and repair manual in indexed booklet form in hardback binders shall be provided for each HVAC control system. The maintenance and repair manual shall include the routine maintenance checklist, a recommended repair methods list, a list of recommended maintenance and repair tools, the qualified service organization list, the as-built commissioning procedures and report, the as-built performance verification test procedures and report, and the as-built equipment data booklet.

a. The routine maintenance checklist shall be arranged in a columnar format. The first column shall list all devices listed in the equipment compliance booklet, the second column shall state the maintenance activity or state no maintenance required, the third column shall state the frequency of the maintenance activity, and the fourth column for additional comments or reference.

b. The recommended repair methods list shall be arranged in a columnar format and shall list all devices in the equipment data compliance booklet and state the guidance on recommended repair methods, either field repair, factory repair, or whole-item replacement.

c. The as-built equipment data booklet shall include the equipment compliance booklet and manufacturer supplied user manuals and information.

d. If the operation manual and the maintenance and repair manual are provided in a common volume, they shall be clearly differentiated and separately indexed.

1.7 MAINTENANCE AND SERVICE

Services, materials and equipment shall be provided as necessary to maintain the entire system in an operational state as specified for a period of one year after successful completion and acceptance of the Performance Verification Test. Impacts on facility operations shall be minimized.

1.7.1 Description of Work

The adjustment and repair of the system shall include the manufacturer's required adjustments of computer equipment, software updates, transmission equipment and instrumentation and control devices.

1.7.2 Personnel

Service personnel shall be qualified to accomplish work promptly and satisfactorily. The Government shall be advised in writing of the name of the designated service representative, and of any changes in personnel.

1.7.3 Scheduled Inspections

Two inspections shall be performed at six-month intervals (or less if required by the manufacturer), and all work required shall be performed. Inspections shall be scheduled in June and December. These inspections shall include:

a. Visual checks and operational tests of equipment.

b. Fan checks and filter changes for control system equipment.

c. Clean control system equipment including interior and exterior surfaces.

d. Check and calibrate each field device. Check and calibrate 50 percent of the total analog points during the first inspection. Check and calibrate the remaining 50 percent of the analog points during the second major inspection. Certify analog test instrumentation accuracy to be twice that of the device being calibrated. Randomly check at least 25 percent of all digital points for proper operation during the first inspection. Randomly check at least 25 percent of the remaining digital points during the second inspection.

e. Run system software diagnostics and correct diagnosed problems.

f. Resolve any previous outstanding problems.

1.7.4 Scheduled Work

This work shall be performed during regular working hours, Monday through Friday, excluding legal holidays.

1.7.5 Emergency Service

The Government will initiate service calls when the system is not functioning properly. Qualified personnel shall be available to provide service to the system. A telephone number where the service supervisor can be reached at all times shall be provided. Service personnel shall be at the site within 24 hours after receiving a request for service. The

control system shall be restored to proper operating condition within three calendar days after receiving a request for service.

1.7.6 Operation

Scheduled adjustments and repairs shall include verification of the control system operation as demonstrated by the applicable tests of the performance verification test.

1.7.7 Records and Logs

Dated records and logs shall be kept of each task, with cumulative records for each major component, and for the complete system chronologically. A continuous log shall be maintained for all devices. The log shall contain initial analog span and zero calibration values and digital points. Complete logs shall be kept and shall be available for inspection onsite, demonstrating that planned and systematic adjustments and repairs have been accomplished for the control system.

1.7.8 Work Requests

Each service call request shall be recorded as received and shall include the serial number identifying the component involved, its location, date and time the call was received, nature of trouble, names of the service personnel assigned to the task, instructions describing what has to be done, the amount and nature of the materials to be used, the time and date work started, and the time and date of completion. A record of the work performed shall be submitted within 5 days after work is accomplished.

1.7.9 System Modifications

Recommendations for system modification shall be submitted in writing. No system modifications, including operating parameters and control settings, shall be made without prior approval of the Government. Any modifications made to the system shall be incorporated into the operations and maintenance manuals, and other documentation affected.

1.7.10 Software

Updates to the software shall be provided for system, operating and application software, and operation in the system shall be verified. Updates shall be incorporated into operations and maintenance manuals, and software documentation. There shall be at least one scheduled update near the end of the first year's warranty period, at which time the latest released version of the Contractor's software shall be installed and validated.

1.8 FACTORY TESTING - NOT USED

PART 2 PRODUCTS

2.1 GENERAL EQUIPMENT REQUIREMENTS

Units of the same type of equipment shall be products of a single manufacturer. Each major component of equipment shall have the manufacturer's name and address, and the model and serial number in a conspicuous place. Materials and equipment shall be standard products of a

manufacturer regularly engaged in the manufacturing of such products, which are of a similar material, design and workmanship. The standard products shall have been in a satisfactory commercial or industrial use for two years prior to use on this project. The two years' use shall include applications of equipment and materials under similar circumstances and of similar size. The two years' experience shall be satisfactorily completed by a product which has been sold or is offered for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures. Products having less than a two-year field service record will be acceptable if a certified record of satisfactory field operation, for not less than 6,000 hours exclusive of the manufacturer's factory tests, can be shown. The equipment items shall be supported by a service organization. Items of the same type and purpose shall be identical, including equipment, assemblies, parts and components. Automatic temperature controls shall be direct digital controls that will provide the required sequence of operation.

2.1.1 Electrical and Electronic Devices

Electrical, electronic, and electropneumatic devices not located within a DDC panel shall have a NEMA ICS 1 enclosure in accordance with NEMA 250 unless otherwise shown.

2.1.2 Standard Signals

Except for air distribution terminal unit control equipment, the output of all analog transmitters and the analog input and output of all DDC controllers shall be 4-to-20 mAdc signals. The signal shall originate from current-sourcing devices and shall be received by current-sinking devices.

2.1.3 Ambient Temperature Limits

DDC panels shall have ambient condition ratings of 35 to 120 degrees F and 10 to 95 percent relative humidity, noncondensing. Devices installed outdoors shall operate within limit ratings of minus 35 to plus 150 degrees F. Instrumentation and control elements shall be rated for continuous operation under the ambient environmental temperature, pressure, humidity, and vibration conditions specified or normally encountered for the installed location.

2.2 NOT USED

2.3 WIRING

2.3.1 Terminal Blocks

Terminal blocks shall be insulated, modular, feed-through, clamp style with recessed captive screw-type clamping mechanism, shall be suitable for rail mounting, and shall have end plates and partition plates for separation or shall have enclosed sides.

2.3.2 Control Wiring for 24-Volt Circuits

Control wiring for 24-volt circuits shall be 18 AWG minimum, stranded copper and shall be rated for 300-volt service.

2.3.3 Wiring for 120-Volt Circuits

Wiring for 120-volt circuits shall be 18 AWG minimum, stranded copper and

shall be rated for 600-volt service.

2.3.4 Instrumentation Cable

Instrumentation cable shall be 18 AWG, stranded copper, single- or multiple-twisted, minimum 2 inch lay of twist, 100 percent shielded pairs, and shall have a 300-volt insulation. Each pair shall have a 20 AWG tinned-copper drain wire and individual overall pair insulation. Cables shall have an overall aluminum-polyester or tinned-copper cable-shield tape, overall 20 AWG tinned-copper cable drain wire, and overall cable insulation.

2.3.5 Transformers

Step down transformers shall be utilized where control equipment operates at lower than line circuit voltage. Transformers, other than transformers in bridge circuits, shall have primaries wound for the voltage available and secondaries wound for the correct control circuit voltage. Transformer shall be sized so that the connected load is 80 percent of the rated capacity or less. Transformers shall conform to UL 508 and NEMA ST 1.

2.4 ACTUATORS

Actuators shall be electric or electronic as shown and shall be provided with mounting and connecting hardware. Electric or electronic actuators shall be used for variable air volume (VAV) air terminal units. Actuators shall fail to their spring-return positions on signal or power failure ,except that VAV terminal unit actuators may be of the floating type. The actuator stroke shall be limited in the direction of power stroke by an adjustable stop. Actuators shall have a visible position indicator. Actuators shall smoothly open or close the devices to which they are applied and shall have a full stroke response time of 90 seconds or less. Electric actuators shall have an oil-immersed gear train. Electric or electronic actuators operating in series shall have an auxiliary actuator driver. Electric or electronic actuators used in sequencing applications shall have an adjustable operating range and start point. Pneumatic actuators shall be rated for 25 psig operating pressure except for high-pressure cylinder-type actuators.

2.4.1 Valve Actuators

Valve actuators shall be selected to provide a minimum of 125 percent of the motive power necessary to operate the valve over its full range of operation.

2.5 AUTOMATIC CONTROL VALVES

Valves shall have stainless-steel stems and stuffing boxes with extended necks to clear the piping insulation. Unless otherwise stated, valves shall have globe style bodies. Valve bodies shall be designed for not less than 125 psig working pressure or 150 percent of the system operating pressure, whichever is greater. Valve leakage rating shall be 0.01 percent of rated Cv. Unless otherwise specified, bodies for valves 1-1/2 inches and smaller shall be brass or bronze, with threaded and union ends; bodies for 2 inch valves shall have threaded ends; and bodies for valves 2 to 3 inches shall be of brass, bronze or iron. Bodies for valves 2-1/2 inches and larger shall be provided with flanged-end connections. Valve Cv shall be within 100 to 125 percent of the Cv shown.

2.5.1 Butterfly Valve Assembly

Butterfly valves shall be threaded lug type suitable for dead-end service and modulation to the fully-closed position, with carbon-steel bodies and noncorrosive discs, stainless steel shafts supported by bearings, and EPDM seats suitable for temperatures from minus 20 to plus 250 degrees F. Valves shall have a manual means of operation independent of the actuator. The rated Cv for butterfly valves shall be the value Cv at 70% open (60 degrees open).

2.5.2 Two-Way Valves

Two-way modulating valves shall have equal-percentage characteristics.

2.5.3 Three-Way Valves

Three-way valves shall provide linear flow control with constant total flow throughout full plug travel.

2.5.4 Terminal-Unit-Coil Valves

Control valves with either flare-type or solder-type ends shall be provided for duct or terminal-unit coils. Flare nuts shall be furnished for each flare-type end valve.

2.5.5 Valves for Chilled-Water, and Glycol Service

Internal valve trim shall be bronze except that valve stems may be type 316 stainless steel. Valve Cv shall be within 100 to 125 percent of the Cv shown. Valves 4 inches and larger shall be butterfly.

2.5.6 Valves for Hot-Water Temperature Service

For hot water service below 250 degrees F internal trim (including seats, seat rings, modulating plugs, and springs) of valves controlling water hotter than 210 degrees F shall be Type 316 stainless steel. Internal trim for valves controlling water 210 degrees F or less shall be brass or bronze. Nonmetallic parts of hot-water control valves shall be suitable for a minimum continuous operating temperature of 250 degrees F or 50 degrees F above the system design temperature, whichever is higher. Valves 4 inches and larger shall be butterfly valves.

2.5.7 Valves for Steam Service - Not Used

2.5.8 Valves for High-Temperature Hot-Water Service - Not Used

2.6 DAMPERS

2.6.1 Damper Assembly

A single damper section shall have blades no longer than 48 inches and shall be no higher than 72 inches. Maximum damper blade width shall be 8 inches. Larger sizes shall be made from a combination of sections. Dampers shall be steel, or other materials where shown. Flat blades shall be made rigid by folding the edges. Blade-operating linkages shall be within the frame so that blade-connecting devices within the same damper section shall not be located directly in the air stream. Damper axles

shall be 0.5 inch minimum, plated steel rods supported in the damper frame by stainless steel or bronze bearings. Blades mounted vertically shall be supported by thrust bearings. Pressure drop through dampers shall not exceed 0.04 inch water gauge at 1,000 feet per minute in the wide-open position. Frames shall not be less than 2 inchesin width. Dampers shall be tested in accordance with AMCA Std 500.

2.6.2 Operating Links

Operating links external to dampers, such as crankarms, connecting rods, and line shafting for transmitting motion from damper actuators to dampers, shall withstand a load equal to at least twice the maximum required damper-operating force. Rod lengths shall be adjustable. Links shall be brass, bronze, zinc-coated steel, or stainless steel. Working parts of joints and clevises shall be brass, bronze, or stainless steel. Adjustments of crankarms shall control the open and closed positions of dampers.

2.6.3 Damper Types

Dampers shall be parallel-blade type.

2.6.3.1 Outside Air, Return Air, and Relief Air Dampers

Outside air, return air and relief air dampers shall be provided where shown. Blades shall have interlocking edges and shall be provided with compressible seals at points of contact. The channel frames of the dampers shall be provided with jamb seals to minimize air leakage. Dampers shall not leak in excess of 20 cfm per square foot at 4 inches water gauge static pressure when closed. Seals shall be suitable for an operating temperature range of minus 40 to plus 200 degrees F. Dampers shall be rated at not less than 2,000 feet per minute air velocity.

2.6.3.2 Mechanical and Electrical Space Ventilation Dampers

Mechanical and electrical space ventilation dampers shall be as shown. Dampers shall not leak in excess of 80 cfm square foot at 4 inches water gauge static pressure when closed. Dampers shall be rated at not less than 1,500 feet per minute air velocity.

2.6.3.3 Smoke Dampers

Smoke-damper and actuator assembly required per NFPA 90A shall meet the Class II leakage requirements of UL 555S. Dampers shall be rated at not less than 2000 fpm air velocity.

2.6.4 Damper End Switches

Each end switch shall be a hermetically sealed switch with a trip lever and over-travel mechanism. The switch enclosure shall be suitable for mounting on the duct exterior and shall permit setting the position of the trip lever that actuates the switch. The trip lever shall be aligned with the damper blade.

2.7 SMOKE DETECTORS

Duct smoke detectors shall be provided in supply and return air ducts in accordance with NFPA 90A. Duct smoke detectors shall conform to the

requirements of UL 268A. Duct smoke detectors shall have perforated sampling tubes extended into the air duct. Detector circuitry shall be mounted in a metallic enclosure exterior to the duct. Detectors shall have manual reset. Detectors shall be rated for air velocities that include air flows between 500 and 4000 fpm. Detectors shall be powered from the fire alarm control panel (FACP). Detectors shall have two sets of normally open alarm contacts and two sets of normally closed alarm contacts. Detectors shall be connected to the building fire alarm panel for alarm initiation. A remote annunciation lamp and accessible remote reset switch shall be provided for duct detectors that are mounted eight feet or more above the finished floor and for detectors that are not readily visible. Remote lamps and switches as well as the affected fan units shall be properly identified in etched rigid plastic placards.

2.8 INSTRUMENTATION

2.8.1 Measurements

Transmitters shall be calibrated to provide the following measurements, over the indicated ranges, for an output of 4 to 20 mAdc:

a. Conditioned space temperature, from 50 to 85 degrees F.
b. Duct temperature, from 40 to 140 degrees F.
c. Not Used.
d. Chilled-water temperature, from 30 to 100 degrees F.
e. Not Used.
f. Heating hot-water temperature, from 50 to 250 degrees F.
g. Not Used.
h. Outside-air temperature, from minus 30 to 130 degrees F.
i. Relative humidity, 0 to 100 percent for space and duct high-limit applications.
j. Differential pressure for VAV supply-duct static pressure from 0 to 2.0 inches water gauge.

2.8.2 Temperature Instruments

2.8.2.1 Resistance Temperature Detectors (RTD)

Temperature sensors shall be 100 ohms 3- or 4-wire RTD. Each RTD shall be platinum with a tolerance of 0.54 degrees F at 32 degrees F with a temperature coefficient of resistance (TCR) of .00214 ohms/ohm/deg F and shall be encapsulated in epoxy, series 300 stainless steel, anodized aluminum, or copper. Each RTD shall be furnished with an RTD transmitter as specified, integrally mounted unless otherwise shown.

2.8.2.2 Continuous Averaging RTD

Continuous averaging RTDs shall have a tolerance of plus or minus 1.0 degree F at the reference temperature, and shall be of sufficient length to ensure that the resistance represents an average over the cross section in which it is installed. The sensing element shall have a bendable copper sheath. Each averaging RTD shall be furnished with an RTD transmitter to match the resistance range of the averaging RTD.

2.8.2.3 RTD Transmitter

The RTD transmitter shall match the resistance range of the RTD. The transmitter shall be a two-wire, loop powered device. The transmitter shall produce a linear 4-to-20 mAdc output corresponding to the required

temperature measurement. The output error shall not exceed 0.1 percent of the calibrated measurement.

2.8.3 Relative Humidity Instruments

A relative-humidity instrument for indoor application shall have a measurement range from 0 to 100 percent relative-humidity and be rated for operation at ambient air temperatures within the range of 25 to 130 degrees F. It shall be capable of being exposed to a condensing air stream (100 percent RH) with no adverse effect to the sensor's calibration or other harm to the instrument. The instrument shall be of the wall-mounted or duct-mounted type, as required by the application, and shall be provided with any required accessories. Instruments used in duct high-limit applications shall have a bulk polymer resistive sensing element. Duct-mounted instruments shall be provided with a duct probe designed to protect the sensing element from dust accumulation and mechanical damage. The instrument (sensing element and transmitter) shall be a two-wire, loop-powered device and shall have an accuracy of plus or minus three percent of full scale within the range of 20 to 80 percent relative humidity. The instrument shall have a typical long-term stability of 1 percent or less drift per year. The transmitter shall convert the sensing element's output to a linear 4-20 mAdc output signal in proportion to the measured relative-humidity value. The transmitter shall include offset and span adjustments.

2.8.4 Not Used
2.8.5 Not Used

2.8.6 Differential Pressure Instruments

The instrument shall be a pressure transmitter with an integral sensing element. The instrument over pressure rating shall be 300 percent of the operating pressure. The sensor/transmitter assembly accuracy shall be plus or minus two percent of full scale. The transmitter shall be a two-wire, loop-powered device. The transmitter shall produce a linear 4-to-20 mAdc output corresponding to the required pressure measurement.

2.8.7 Thermowells

Thermowells shall be Series 300 stainless steel with threaded brass plug and chain, 2 inch lagging neck and extension type well. Inside diameter and insertion length shall be as required for the application.

2.8.8 Sunshields

Sunshields for outside air temperature sensing elements shall prevent the sun from directly striking the temperature sensing elements. The sunshields shall be provided with adequate ventilation so that the sensing element responds to the ambient temperature of the surroundings. The top of each sunshield shall have a galvanized metal rainshield projecting over the face of the sunshield. The sunshields shall be painted white.

2.9 THERMOSTATS

Thermostat ranges shall be selected so that the setpoint is adjustable without tools between plus or minus 10 degrees F of the setpoint shown. Thermostats shall be electronic or electric.

2.9.1 Nonmodulating Room Thermostats

Contacts shall be single-pole double-throw (SPDT), hermetically sealed, and wired to identified terminals. Maximum differential shall be 5 degrees F. Room thermostats shall be enclosed with separate locking covers (guards).

2.9.2 Microprocessor Based Room Thermostats

Microprocessor based thermostats shall have built-in keypads for scheduling of day and night temperature settings. When out of the scheduling mode, thermostats shall have continuous display of time, with AM and PM indicator, continuous display of day of week, and either continuous display of room temperature with display of temperature setpoint on demand, or continuous display of temperature setpoint with display of room temperature on demand. In the programmable mode, the display shall be used for interrogating time program ON-OFF setpoints for all seven days of the week. The time program shall allow two separate temperature setback intervals per day. The thermostats shall have a means for temporary and manual override of the program schedule, with automatic program restoration on the following day. Thermostats shall have a replaceable battery to maintain the timing and maintain the schedule in memory for one year in the event of a power outage. Maximum differential shall be 2 degrees F. When used for heat pump applications, the thermostat shall have an emergency heat switch.

2.9.3 Modulating Room Thermostats

Modulating room thermostats shall have either one output signal, two output signals operating in unison, or two output signals operating in sequence, as required for the application. Each thermostat shall have an adjustable throttling range of 4 to 8 degrees F for each output. Room thermostats shall be enclosed with separate locking covers (guards).

2.9.4 Nonmodulating Capillary Thermostats and Aquastats

Each thermostat shall have a capillary length of at least 5 feet, shall have adjustable direct-reading scales for both setpoint and differential, and shall have a differential adjustable from 6 to 16 degrees F. Aquastats shall be of the strap on type, with 10 degrees F fixed differential.

2.9.5 Freezestats

Freezestats shall be manual reset, low temperature safety thermostats, with NO and NC contacts and a 20 foot element which shall respond to the coldest 18 inch segment.

2.9.6 Modulating Capillary Thermostats

Each thermostat shall have either one output signal, two output signals operating in unison, or two output signals operating in sequence, as required for the application. Thermostats shall have adjustable throttling ranges of 4 to 8 degrees F for each output.

2.9.7 Fan-Coil Unit Room Thermostats

Fan-coil unit thermostats in personnel living spaces shall be of the low voltage type with locking covers. Electrical rating shall not exceed 2.5 amperes at 30 volts ac. Housing shall be corrosion resisting metal or molded plastic. Transformer and fan relay shall be provided for the proper

operation of each thermostatic control system as necessary to suit the design of the control system using the thermostats specified below. Either separate heating thermostats and separate cooling thermostats or dual element heating cooling thermostats may be provided. Motor speed switches shall be provided for three-speed fan control.

2.9.7.1 Heating Thermostat

Fan-coil heating thermostats shall be provided with fixed heat anticipation and shall have a single-pole, single-throw (SPST) switch hermetically sealed and actuated by a bimetallic or bellows type element. Thermostats shall be provided with external temperature setting devices with a factory set maximum of 72 degrees F. Heating thermostats shall have an adjustable range of at least 13 degrees below 72 degrees F.

2.9.7.2 Cooling Thermostat

Fan-coil cooling thermostats shall be provided with fixed cooling anticipation heater and shall have a single-pole, single-throw (SPST) switch hermetically sealed and actuated by a bimetallic or bellows type element. Thermostats shall be provided with external temperature setting devices with a factory set minimum of 78 degrees F. Cooling thermostats shall have an adjustable range of at least 7 degrees above 78 degrees F.

2.9.7.3 Combination Thermostat

Fan coil unit combination heating-cooling thermostats shall be provided with separate temperature sensing elements for each system, and shall have a single-pole, single-throw (SPST) switch, hermetically sealed and actuated by a bimetallic or bellows type element. Each element shall operate switches to provide single stage control for heating and cooling. Scales and ranges shall be as specified for individual thermostats. Thermostats shall contain, or a subbase shall be provided which contains, selector switches for Heat-Off-Cool. A changeover controller providing automatic summer-winter changeover for thermostats by sensing the supplied fluid temperature shall be provided. A limited range heating-cooling dead band thermostat shall control cooling when temperature is above the upper setpoint and heating when temperature is below the lower setpoint and shall have a dead band, with no heating or cooling, when temperature is between the setpoints. Setpoint adjustment shall be concealed.

2.10 PRESSURE SWITCHES AND SOLENOID VALVES

2.10.1 Pressure Switches

Each switch shall have an adjustable setpoint with visible setpoint scale. Range shall be as shown. Differential adjustment shall span 20 to 40 percent of the range of the device.

2.10.2 Differential-Pressure Switches

Each switch shall be an adjustable diaphragm-operated device with two SPDT contacts, with taps for sensing lines to be connected to duct pressure fittings designed to sense air pressure. These fittings shall be of the angled-tip type with tips pointing into the air stream. The setpoint shall not be in the upper or lower quarters of the range and the range shall not be more than three times the setpoint. Differential shall be a maximum of 0.15 inch water gauge at the low end of the range and 0.35 inch water gauge at the high end of the range.

2.11 INDICATING DEVICES

2.11.1 Thermometers

2.11.1.1 Piping System Thermometers

Piping system thermometers shall have brass, malleable iron or aluminum alloy case and frame, clear protective face, permanently stabilized glass tube with indicating-fluid column, white face, black numbers, and a 9 inch scale. Thermometers for piping systems shall have rigid stems with straight, angular, or inclined pattern.

2.11.1.2 Piping System Thermometer Stems

Thermometer stems shall have expansion heads as required to prevent breakage at extreme temperatures. On rigid-stem thermometers, the space between bulb and stem shall be filled with a heat-transfer medium.

2.11.1.3 Nonaveraging Air-Duct Thermometers

Air-duct thermometers shall have perforated stem guards and 45-degree adjustable duct flanges with locking mechanism.

2.11.1.4 Averaging Air-Duct Thermometers

Averaging thermometers shall have a 3-1/2 inch (nominal) dial, with black legend on white background, and pointer traveling through a 270-degree arc.

2.11.1.5 Accuracy

Thermometers shall have an accuracy of plus or minus one percent of scale range. Thermometers shall have a range suitable for the application.

2.11.2 Pressure Gauges

Gauges shall be 2 inch (nominal) size, back connected, suitable for field or panel mounting as required, shall have black legend on white background, and shall have a pointer traveling through a 270-degree arc. Accuracy shall be plus or minus three percent of scale range. Gauges shall meet requirements of ASME B40.1.

2.11.2.1 Not Used
2.11.2.2 Not Used

2.11.2.3 Hydronic System Gauges

Gauges for hydronic system applications shall have ranges and graduations as shown.

2.11.3 Low Differential Pressure Gauges

Gauges for low differential pressure measurements shall be a minimum of 3.5 inch (nominal) size with two sets of pressure taps, and shall have a diaphragm-actuated pointer, white dial with black figures, and pointer zero adjustment. Gauges shall have ranges and graduations as shown. Accuracy shall be plus or minus two percent of scale range.

2.12 CONTROL DEVICES AND ACCESSORIES

2.12.1 Relays

Control relay contacts shall have utilization category and ratings selected for the application, with a minimum of two sets of contacts (two normally open, two normally closed) enclosed in a dustproof enclosure. Relays shall be rated for a minimum life of one million operations. Operating time shall be 20 milliseconds or less. Relays shall be equipped with coil transient suppression devices to limit transients to 150 percent of rated coil voltage. Time delay relays shall be 2PDT with eight-pin connectors, dust cover, and a matching rail-mounted socket. Adjustable timing range shall be 0 to 5 minutes. Power consumption shall not be greater than three watts.

2.12.2 Not Used

2.12.3 Joule or Watthour Meters

Watthour meters shall be in accordance with ANSI C12.1 and have pulse initiators for remote monitoring of Watthour consumption. Pulse initiator shall consist of form C contacts with a current rating not to exceed two amperes and voltage not to exceed 500 V, with combinations of VA not to exceed 100 VA, and a life rating of one billion operations. Meter sockets shall be in accordance with ANSI C12.1.

2.12.4 Joule or Watthour Meters with Demand Register

Meters shall be in accordance with ANSI C12.1 and shall have pulse initiators for remote monitoring of Watthour consumption and instantaneous demand. Pulse initiators shall consist of form C contacts with a current rating not to exceed two amperes and voltage not to exceed 500 V, with combinations of VA not to exceed 100 VA, and a life rating of one billion operations. Meter sockets shall be in accordance with ANSI C12.1

2.12.5 Joule or Watthour Transducers

Watthour transducers shall have an accuracy of plus or minus 0.25 percent for kW and kWh outputs from full lag to full lead power factor. Input ranges for kW and kWh transducers shall be selectable without requiring the changing of current or potential transformers. The output shall be 4 to 20 mAdc.

2.12.6 Current Sensing Relays

Current sensing relays shall provide a normally-open contact rated at a minimum of 50 volts peak and 1/2 ampere or 25 VA, noninductive. There shall be a single hole for passage of current carrying conductors. The devices shall be sized for operation at 50 percent rated current based on the connected load. Voltage isolation shall be a minimum of 600 volts.

2.12.7 Power-Line Conditioners (PLC)

Power line conditioners shall be furnished for each DDC panel. The PLCs shall provide both voltage regulation and noise rejection. The PLCs shall be of the ferro-resonant design, with no moving parts and no tap switching, while electrically isolating the secondary from the power-line side. The PLCs shall be sized for 125 percent of the actual connected kVA load. Characteristics of the PLC shall be as follows:

a. At 85 percent load, the output voltage shall not deviate by more than plus or minus one percent of nominal when the input voltage fluctuates between minus 20 percent to plus 10 percent of nominal.

b. During load changes of zero to full load, the output voltage shall not deviate by more than plus or minus three percent of nominal voltage. Full correction of load switching disturbances shall be accomplished within five cycles, and 95 percent correction shall be accomplished within two cycles of the onset of the disturbance.

c. Total harmonic distortion shall not exceed 3-1/2 percent at full load.

2.13 NOT USED

2.14 DIRECT DIGITAL CONTROL (DDC) HARDWARE

All functions, constraints, data base parameters, operator developed programs and any other data shall be downloadable from a portable workstation/tester or the existing central workstation/tester (WEC USC 3000 Utility Control system (COS))to RTU's and ACU's. Download shall be accomplished through both the primary network and the local CU portable workstation/tester port.

2.14.1 RTU (Remote Control Unit)

Remote control unit shall be WEC Model 3218 RCU:

Processor: MOTOROLA 68000, 10 MHZ

Memory: 1 MB RAM, 256 KB FLASH.

Digital Inputs: (8) 5 TO 24 AC or DC, jumper select 24 VAC power for dry contacts LED indicators for each input.

Digital Outputs: (8) relays with 24 VAC 2 AMP Contacts, with HOA switches jumper select common to 24 VAC constant for watchdog power LED indicators for each output. Hand-Off-Auto switches for each output.

Analog Inputs: (16) 4-20 mA.

Analog Outputs: (8) 4-20 mA, with HOA switches and manual adjustment Manual-Off-Auto switches for each output.

Pulse Accumulator: (4) 5 To 24 VOLT AC or DC jumper select 24 VAC power for dry contacts.

Communications: HOST: RS232/ACU: RS232/UCU: RS485/Diagnostics: RS232.

Memory Backup: 168 HOURS USING SUPER CAPACITORS.

Integral Features

The RCU shall include:

a. Main power switch.

b. Power on indicator.

c. Portable workstation/tester port, connector, and if necessary power supply.

d. Manufacturers control network port.

e. Hand-Off-Auto switches for each DO which controls a device. These switches shall be mounted in the RCU, with the exception of motors, for which the switch shall be mounted at the motor control center. On-Off-Auto switches are not required for DO associated with a status or alarm such as pilot lights. The status of these switches shall be available to the RCU for further processing.

f. Manual-Off-Auto switches for each AO. The status of these shall be available to the panel for further processing.

2.14.2 ACU (Auxiliary Control Unit)

Auxiliary Control Unit shall be WEC Model 3318 ACU:

Processor: MOTOROLA 68000, 10 MHZ

Memory: 1 MB RAM, 256 KB FLASH.

Digital Inputs: (8) 5 TO 24 AC or DC, jumper select 24 VAC power for dry contacts LED indicators for each input.

Digital Outputs: (8) relays with 24 VAC 2 AMP Contacts, with HOA switches jumper select common to 24 VAC constant for watchdog power LED indicators for each output. Hand-Off-Auto switches for each output.

Analog Inputs: (16) 4-20 mA.

Analog Outputs: (8) 4-20 mA, with HOA switches and manual adjustment Manual-Off-Auto switches for each output.

Pulse Accumulator: (4) 5 To 24 VOLT AC or DC jumper select 24 VAC power for dry contacts.

Communications: HOST: RS232/ACU: RS232/UCU: RS485/Diagnostics: RS232.

2.14.2.1 Integral Features

The ACU shall include:

a. Main power switch.

b. Power on indicator.

c. Portable workstation/tester port, connector, and if necessary power supply.

d. Manufacturers control network port.

e. Hand-Off-Auto switches for each DO which controls a device. These switches shall be mounted in the ACU, with the exception of motors, for which the switch shall be mounted at the motor control center. On-Off-Auto switches are not required for DO associated with a status or alarm such as pilot lights. The status of these switches shall be available to the ACU

for further processing.

f. Manual-Off-Auto switches for each AO. The status of these shall be available to the panel for further processing.

2.14.3 Not Used
2.14.4 Not Used

2.14.5 Chiller Control Panel

Chiller control panel shall be microprocessor-based and shall provide, both locally and through the Manufacturers Control Network, the control, monitoring, and safety equipment functions provided by the chiller manufacturer's control panel(s) (two communications ports total). The chiller control panel instrumentation and control ranges and accuracies shall match those of the chiller manufacturer's control devices. The chiller panel shall have a communication port for interface to a Portable Workstation/Tester through either the Manufacturers Control Network or modem for chiller(s) start/stop, and monitoring of chiller operating status, alarms, and power consumption.

2.14.6 Boiler Control Panel

Boiler control panel shall be microprocessor-based and shall provide, both locally and through the Manufacturers Control Network, the control, monitoring, and safety equipment functions provided by the boiler manufacturer's control panel(s) (two communications ports total). The boiler control panel instrumentation and controls ranges and accuracies shall match those of the boiler manufacturer's control devices. The boiler panel shall have a communication port for interface to a Portable Workstation/Tester through either the Manufacturers Control Network or modem for boiler(s) and start/stop, boiler water temperature reset, and monitoring of boiler operating status, alarms.

2.14.7 Not Used

2.14.8 CU Portable Workstation/Tester (Portable Diagnostic Test Unit (PDTU))

A portable workstation/tester shall be provided and shall be able to connect to any ACU or RCU hardware. The portable workstation/tester shall consist of a notebook portable computer (IBM PC compatible)capable of displaying up to 256 colors at a minimum resolution of 640 X 480 pixels, 85 key keyboard. 40 Kbytes RAM. The portable workstation/tester shall have, as a minimum, a 400 MB hard drive, integral pointing device, serial and parallel ports, color VGA video port for an external color monitor, 3.5 inch microdiskettedrive, rechargeable battery, battery charger and 120 Vac power supply or Internal NiCad battery pack operated. It shall include carrying case, extra battery, charger and a compatible network adapter. The portable workstation/tester shall:

a. Run CUdiagnostics.

b. Load all CU RAMresident programs and database information.

c. Display any AI, DI, AO, DO, or PA point in engineering units for analog points or status for digital points.

d. Control any AO or DO.

e. Provide an operator interface, in alphanumerics and decimal.

f. Display RAM location.

g. Modify RAM locations.

h. Download database and programs from COS & PDTU.

2.14.9 Central Workstation/Tester - Not Used
2.14.10 Data Terminal Cabinet (DTC) - Not Used

2.15 DDC SOFTWARE

ACUs interface directly to the DE and perform some of the RCU functions. ACU software shall be held entirely in EPROM. There shall be one ACU program for all ACUs and it determines its I/O configuration at start-up. The ACU software shall scan all input points and reports only changes to the RCU when polled. ACU software shall also respond to RCU requests to read and transmit all point values. The analog input points shall be averaged in the ACU before transmission to the RCU. Output points shall be set by commands from the RCU.

A RCU shall poll all ACUs under its control. RCUs shall receive only the changes since the last poll. These changes shall be stored in the RCU data base and shall be also transmitted to the COS. The RCU checks it's RCU resident constraints before issuing and output command to the ACU. The RCU shall have a hardware clock that is corrected periodically from the COS. The time correction shall be performed at least once per day and after each communication failure or power interruption.

UCUs shall contain a dedicated control program whose sole purpose shall be to manage a single control loop. UCUs contain all analog and digital output hardware necessary to communicate with the few points actually used in the control loop. This typically consists of one temperature sensor, an air flow sensor, open/close damper digital outputs, and sometimes electric heat output points. The UCUs shall be completely capable of running in standalone mode once setup and started. Normally UCUs shall be polled by the RCUs and pass all status/control information to and from the COS via this path. In addition they shall coordinate their control functions with the RCUs.

2.15.1 Operating System

The RCU and UCU Multitasking Operating System (FIDMOS) was written by Williams Electric Company, Inc. to control and schedule all RCU tasks. FIDMOS is an interrupt driven operating system which provides inter-task communication through message packets. FIDMOS can handle 255 tasks, 256 priority levels, and 32 event flags. It also provides various timer facilities to the tasks running in the RCUs and UCUs. The task scheduling algorithm is round-robin for tasks of equal priority.

FIDMOS maintains the current time of day which is synchronized with the COS periodically to within plus/minus 1 second. The time synchronization is performed automatically by the COS without operator intervention and without shutting down the system. Time is maintained as year, month, date,

day of week, hours, minutes, and seconds.

The application tasks that execute under FIDMOS shall maintain the RCU/UCU unit and point data bases entirely in RCU/UCU RAM.

The RCU flash memory firmwareshall allow downloading of software and data from the COS or the Portable Diagnostic Test Unit (PDTU).

UCU software shall be contained in EPROM and is "configured" by data base information downloaded from the COS via the RCU or from the PDTU. Once loaded, it may also be altered by the hand held programmer.

2.15.1.1 (CU) Control Unit Startup

When a CU is powered on, manually or automatically after a power failure, the CU startup routine shall read the state of the option switches, determine the status of RAM (retained or not retained), and wait for a message from the COS. If no message is received and RAM has been retained, the RCU shall continue operation in stand-alone mode. If RAM has not been retained, the RCU shall not poll it's ACUs, thus keeping the DE failure mode in effect. The RCU shall not operate at all if a low battery condition exists and therefore does not enter communication mode or stand-alone mode. In this condition, the RCU does nothing and its ACUs revert to their failure mode.

The COS shall automatically establish communications with RCUs when the RCU is powered on. RCUs can be loaded automatically by the COS or manually from the operator's console or the portable diagnostic unit.

Startup of designated large loads shall be automatically staggered to prevent demand surges during a restart operation. Each CU shall be unique adjustable 0 to 600 second delay from power fail recovery to start of restart if the software and data base are resident.

2.15.1.2 CU Operating Mode

CUs shall perform all specified control and monitoring functions independent of COS communications. Functions and applications shall be performed based on data base parameters, current DE data, and the real time clock. The real time clock shall be updated from the COS at least once a day. The clocks shall be stable enough to maintain time within one or two seconds over a 24 hour period. All DE commands shall be subjected to constraint checking. Complete status including point values, and alarms shall be transmitted to the COS when the communications circuits are operational. While in stand-alone mode, any information normally transmitted to the COS shall be stored for later transmission when communications is re-established. The CU shall accept software downloaded from the COS. Constraints shall reside in the CU.

2.15.1.3 CU Failure Mode

Upon failure (and CU is unable to continue stand-alone operation) for any reason, each CU shall perform an orderly shutdown and force all CU outputs to a predetermined (failure mode) state, consistent with the failure modes shown and the associated control device.

2.15.2 Functions

The Contractor shall provide software necessary to accomplish the following functions, as appropriate, fully implemented and operational, within each RCU, ACU, and UCU.

a. Scanning of inputs.
b. Control of outputs.
c. Reporting of analog changes by exception.
d. Reporting of unauthorized digital status.
e. Reporting of alarms automatically to COS.
f. Reporting of I/O status to COS upon poll by COS.
g. Maintain time of day, updated by the COS at least once a day.
h. Communication with the CU.
i. Execution of CU resident application programs.
j. Averaging or filtering of analog inputs.
k. Constraints checking (prior to command issuance.
l. CU Diagnostics.
m. CU portable workstation/tester operation.
n. Reset of PA by operator based on time and value.

2.15.2.1 Analog Monitoring

The system measures and transmits and displays all analog values including calculated analog points. Analog values are reported after loss of communications, or when valuechanges by a preset differential value . The system shall allow each point to have individual unique engineering unit conversion.

2.15.2.2 Logic (Virtual) Points

Instead, their value shall be calculated from a combination of various input values, output values, and constraints. They may be either analog or digital and computed from analog and/or real points. Application programs cannot distinguish calculated points from real points. Virtual points shall be updated within the CU within 5 seconds of any input value changes. Virtual points include:

a) Control loop setpoints
b) Control loop gain constraints
c) Control loop integral constraints
d) Summer/Winter operation
e) Real time
f) Scheduled on/off times
g) Equipment run time targets
h) Calculated point values
I) Heating/Cooling mode operation authorization
j) Economizer mode operation authorization

2.15.3 I/O Point Database/Parameter Definition

Each I/O point shall be defined in a database residing in the CU and COS. The definition include all required physical parameters associated and, the required COS data base subset shall be automatically extracted for downloading to any CU:

2.15.4 Alarm Processing

Each CU shall have alarm processing software for AI, DI, and PA alarms for all real and virtual points connected to that CU.

2.15.4.1 Digital Alarms Definition

Digital alarms are those abnormal conditions indicated by DIs as specified and shown.

2.15.4.2 Analog Alarms Definition

Analog pointsare compared to pre-defined highand low limits. Excursions outside of these limits shall be flagged as alarms and reported to the COS. Points shall return to normal by a predefined differential value prior to being declared to be out of alarm a second time. All high limits, low limits, and differentials shall be uniquely defined for each point in the UCS. These values can be altered on-line without interrupting the monitoring of any point.

2.15.4.3 Pulse Accumulator Alarms Definition

Shall be processed identically to analog alarms described in the preceding paragraph.

2.15.5 Constraints

2.15.5.1 Equipment Constraints Definitions

Constraints are entered for each control point in the CU data base including as applicable:

a. Maximum starts per hour.
b. Minimum off time.
c. Minimum on time.
d. High limit (in engineering units).
e. Low limit (in engineering units).

2.15.5.2 CU Constraints Diagnostics

Control devices connected to the system shall have the DDC memory resident constraints checked before each command is issued to insure that no equipment damage will result from improper operation. Each command shall be executed by the DDC only after all constraints checks have been passed. Each command point shall have unique constraints assigned. High and low "reasonableness" values or one differential "rate-of-change" value shall be assigned to each AI. Values outside the reasonableness limits shall be rejected and an alarm message sent to the network control panel or portable workstation/tester. Status changes and analog point values shall be reported to the workstation upon operator request, such as for reports, alphanumeric displays, graphic displays, and application programs. Each individual point shall be capable of being selectively disabled by the operator from a workstation/tester. Disabling a point shall prohibit monitoring and automatic control of that point.

2.15.6 CU Diagnostics

Each CUshall have self-test diagnostic implemented in false memory. The tests shall include test of memory. Additional diagnostic software shall

be included with portable workstation/tester. The portable workstation/tester diagnostics software shall display messages in English which functions have failed to inform the tester's operator of diagnosed problems.

2.15.7 Summer-Winter Operation Monitoring

See Scheduled start/stop program.

2.15.8 Control Sequences and Control Loops

Operator commands shall be provided to create, modify, and execute control loops as specified. The data entry process shall be prompt for operator input wherever necessary. All modifications require operator confirmation before the changes are put into effect. All mathematical functions required to implement the sequences and loop shall be available. RCUs shall have sufficient capacity to handle at least four additional control sequences and control loops beyond the number implemented at installation time. Control sequences can accommodate many more than 8 terms or devices.

The Cus shall provide the following functions:

a) Two Position Control - which controls a two state device by comparing a setpoint against a realtime value and an established deadband.

b) Floating Point Control - which exercises control when an error signal exceeds an established deadband and maintains control until the
signal is within the deadband limits.

c) Signal Selection - which allows the selection of the highest or lowest of a group of analog signals so as to reduce these to a single value.

d) Signal Averaging -which allows the averaging of multiple analog signals into a single value. Permiting optional weighting of input signal to bias control output.

e) Reset Function - which allows an analog output to be set based on any combination of input data including reset schedules.

f) PID Control - with direct digital control (DDC) implemented by using a proportional,integral, differential function to compute the control point value from the set point and measured values.

2.15.9 Not Used

2.15.10 CU Resident Application Software

With the exception of scheduled start/stop, setback, duty cycling, and optimum start stop, all CU resident applications shall be implemented as algorithms written by Williams Electric Company, Inc. Control Language. This allows a degree of customization which is not attainable by using pre-written software. The algorithm language shall be sufficiently flexible that virtually any sequence of operation can be implemented no matter how complex. CUs shall contain all information required to execute the applications within their memory and operate equally well whether operating standalone, or on-line with the COS.

MostWEC applications are divided into two parts. The first part is determination of the set point. This can use any of a number of different strategies depending on the desired results. Typically this ranges anywhere from a manually set constant to a set point determined by outside air temperature. The second part of the application is to attain and maintain the desired set point. This is most often done by using a PID controlled Direct Digital Control Loop. However it can also be implemented using an number of other functions including two point control or control of an external set point controller.

2.15.10.1 Not Used

2.15.10.2 Scheduled Start/Stop Program

The scheduled start/stop application program shall reside in the CU with the data base maintained in the COS and downloaded to the CU. The scheduled start/stop program is responsible for establishing the time interval over which particular units are running. Two Schedules are maintained for each unit, a summer schedule and a winter schedule. Each schedule is a table of up to 16 pairs of start and stop times per units. The table represents an 8 day schedule of weekdays, weekends, and holidays. Thus, on the average, each unit may have two "on" periods per day. Since the CU has real time clock to input time-of-day, it can then start and stop units according to their schedules.

Holidays shall be handled automatically by the CU. A table of holidays (up to 14 per year) are maintained in the COS and downloaded to the CUs. When the CU determines from its real time clock that the current day matches a date in the holiday table, the CU uses the holiday schedule (eight day) for that day only.

Each unit in the system shall have a data parameter that specifies if the unit is a heating unit, cooling unit, or both. This program only starts and stops heating units in the heating season and cooling units in the cooling season. Units that are both heating and cooling units are started and stopped during both seasons. The operator shall have a command to declare the season on a unit-by-unit basis for the entire system. Alternately, the CU can be set up for automatic season change based upon outside air temperature or date. For temperature changeover, the heating or cooling season is active depending on the date. Since the CU shall contain both summer and winter schedules, then the manual or automatic season change causes the CU to use the appropriate schedule.

Before starting or stopping a unit, the constraints shall be checked. The operator can assign an adjustable time delay for consecutive starts on units identified as having large electrical loads.

Summer and winter high-low alarm limits shall be handled by the alarm program.

2.15.10.3 Optimum Start/Stop Program - Not Used

2.15.10.4 Day-Night Setback Program

This program runs in the CU during scheduled unoccupied hours for equipment that is identified for setback controls. The program turns "on" equipment when the space temperature is outside the setback temperature limits. The equipment is turned "off" when the space temperature returns to within the

setback temperature limit by a specified setback temperature differential. There is a setback temperature limit for heating season and another one for the cooling season. The program also uses the appropriate summer or winter schedule contained in the CU.

2.15.10.5 Economizer Program I

This program shall run in the CU and will periodically check the outside air temperature and return air temperatures for each unit assigned to it. When the outside air temperature is below a certain level in the cooling season, the dampers are positioned to maintain the mixed air temperature requirements. When the outside air temperature rises above the return air temperature, the dampers are set to the minimum position which still meets ventilation requirements, thus reducing the cooling load.

2.15.10.6 Ventilation/Recirculation and Flush Programs

This program shall run in the CU. The program keeps the OA damper closed during all unoccupied periods (outside of the warm-up and cool-down cycles) and during any setback periods. During the warm-up and cool-down periods just prior to occupancy, the OA and exhaust dampers are opened and the return air damper is closed when the outside air temperature is above (winter) or below (summer) the space temperature.

2.15.10.7 Hot Deck/Cold Deck Temperature Reset Program

This program shall run in the CU and attempts to minimize energy consumption of Hot Deck/Cold Deck Air Handling Units by reducing the temperature difference between the decks to the minimum required. This program shall periodically scan conditions in all spaces fed by each air handler assigned to it. This is determined by spaces not meeting required occupancy temperature limits. If any spaces are not meeting temperature requirements, then the hot deck and/or cold deck are adjusted for higher and lower temperatures, respectively. If however, all spaces meet temperature, then the hot deck and/or cold deck temperatures shall be adjusted for lower and higher temperatures respectively to save energy. If a space is also under humidity control, then the space humidity will also be monitored and the cold deck temperature shall not be raised if space humidity cannot be maintained.

2.15.10.8 Reheat Coil Reset Program - Not Used

2.15.10.9 Heating and Ventilating Unit Program

This program shall run in the CU. It uses direct digital control loop to optimally regulate the position of a hot water control valve so as to maintain a desired space or supply air set point. This program shall be coordinated with the ventilation-recirculation program and the scheduled start/stop program.

2.15.10.10 Air Volume Control Program

This program runs in the CU and monitors supply and return/exhaust air flow volumes and modulates the fan controls to maintain required air flow volumes and/or ratios or it maintains required fixed differentials between supply and return air flows. This program is coordinated with the ventilation-recirculation program for damper control and with static pressure control requirements for fan control.

2.15.10.11 Air Distribution Unitary Controller Software

Software will be provided for the management and control of air distribution terminal units (ADTUs). The software allows the assignment of ADTUs to functional groups which may be treated as single entities; monitoring, alarming and reporting of parameters; extended service processing; and set point adjustment.

The following minimum functions are provided by each UCU:

a. volume control in response to temperature
b. volume flow limits
c. occupied and unoccupied operation with associated temperature and volume limits
d. occupant temperature adjustment where required
e. temperature set point override
f. occupant override

2.15.10.12 Chiller Selection Program

This program runs in the CU and is used to select the most efficient chiller or combination of chillers to meet a cooling load. The algorithm used is essentially the same as the steam and hot water boiler optimization programs. The primary difference is that the program is optimizing cooling efficiency which is essentially a negative heat flow. Thus the cooling load is determined by how many more BTUs of heat are present in the return water than are in the supply water. The computed cooling load and current weather trend are used to predict the cooling demand for the next interval by using the prediction subroutine. The most efficient set of chillers are then chosen by using the manufacturer's data which will be in the chiller data base on disk. The appropriate set of chillers will then be started, stopped, or set to the proper cooling limit. All equipment constraints, start/stop sequences, and interlocks will be observed.

2.15.10.13 Absorption Chiller Efficiency and Monitoring Program - Not Used
2.15.10.14 Chilled Water Temperature Reset Program - Not Used
2.15.10.15 Condenser Water Temperature Reset Program - Not Used
2.15.10.16 Chiller Demand Limit Program

2.15.10.17 Hot Water OA Reset Program

This program shall run in the CU and attempts to reduce heat loss from hot water equipment and piping reducing hot water temperature when conditions permit. This program shall monitor outside air temperature and raise the hot water boiler setpoint in inverse proportion to the air temperature. The reset schedule is predetermined for each unit controlled by this program.

2.15.10.18 Remote Boiler Monitoring and Control

This program shall run in the CU and checks a list of real or calculated digital and analog points for a boiler against digital status and analog limits that were entered by an operator for each point. If any of the digital points in an improper state, or an analog point has exceeded its limit, the boiler operation shall be automatically be discontinued.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION CRITERIA

3.1.1 HVAC Control System

The HVAC control system shall be completely installed and ready for operation. Dielectric isolation shall be provided where dissimilar metals are used for connection and support. Penetrations through and mounting holes in the building exterior shall be made watertight. The HVAC control system installation shall provide clearance for control system maintenance by maintaining access space between coils, access space to mixed-air plenums, and other access space required to calibrate, remove, repair, or replace control system devices. The control system installation shall not interfere with the clearance requirements for mechanical and electrical system maintenance.

3.1.2 Software Installation

Software shall be loaded for an operational system, including databases for all points, operational parameters, and system, command, and application software. The Contractor shall provide original and backup copies of source, excluding the general purpose operating systems and utility programs furnished by computer manufacturers and the non-job-specific proprietary code furnished by the system manufacturer, and object modules for software on each type of media utilized, within 30 days of formal Government acceptance. In addition, a copy of individual floppy disks of software for each DDC panel shall be provided.

3.1.3 Device Mounting Criteria

Devices mounted in or on piping or ductwork, on building surfaces, in mechanical/electrical spaces, or in occupied space ceilings shall be installed in accordance with manufacturer's recommendations and as shown. Control devices to be installed in piping and ductwork shall be provided with required gaskets, flanges, thermal compounds, insulation, piping, fittings, and manual valves for shutoff, equalization, purging, and calibration. Strap-on temperature sensing elements shall not be used except as specified.

3.1.4 Wiring Criteria

Wiring external to control panels, including low-voltage wiring, shall be installed in metallic raceways. Nonmetallic-sheathed cables or metallic-armored cables may be installed in areas permitted by NFPA 70 Wiring shall be installed without splices between control devices and DDC panels. Instrumentation grounding shall be installed as necessary to prevent ground loops, noise, and surges from adversely affecting operation of the system. Ground rods installed by the contractor shall be tested as specified in IEEE Std 142. Cables and conductor wires shall be tagged at both ends, with the identifier shown on the shop drawings. Electrical work shall be as specified in Section 16415A ELECTRICAL WORK, INTERIOR and as shown.

3.2 CONTROL SYSTEM INSTALLATION

3.2.1 Damper Actuators

Actuators shall not be mounted in the air stream. Multiple actuators operating a common damper shall be connected to a common drive shaft. Actuators shall be installed so that their action shall seal the damper to the extent required to maintain leakage at or below the specified rate and

shall move the blades smoothly.

3.2.2 Not Used

3.2.3 Room Instrument Mounting

Room instruments, such as wall mounted thermostats, shall be mounted 60 inchesabove the floor unless otherwise shown. Temperature setpoint devices shall be recess mounted.

3.2.4 Freezestats

For each 20 square feet of coil face area, or fraction thereof, a freezestat shall be provided to sense the temperature at the location shown. Manual reset freezestats shall be installed in approved, accessible locations where they can be reset easily. The freezestat sensing element shall be installed in a serpentine pattern.

3.2.5 Averaging Temperature Sensing Elements

Sensing elements shall have a total element minimum length equal to 1 linear foot per square foot of duct cross-sectional area.

3.2.6 Foundations and Housekeeping Pads

Foundations and housekeeping pads shall be provided for the HVAC control system air compressors.

3.2.7 Not Used

3.2.8 Duct Static Pressure Sensing Elements and Transmitters

The duct static pressure sensing element and transmitter sensing point shall be located at 75% to 100% of the distance between the first and last air terminal units.

3.2.9 Indication Devices Installed in Piping and Liquid Systems

Gauges in piping systems subject to pulsation shall have snubbers. Gauges for steam service shall have pigtail fittings with cock. Thermometers and temperature sensing elements installed in liquid systems shall be installed in thermowells.

3.2.10 Not Used

3.3 CONTROL SEQUENCES OF OPERATION

3.3.1 General Requirements - HVAC Systems

These requirements shall apply to all primary HVAC systems unless modified herein. The sequences describe the actions of the control system for one direction of change in the HVAC process analog variable, such as temperature, humidity or pressure. The reverse sequence shall occur when the direction of change is reversed. Sequence of operation shall be as indicated on contract drawings.

3.3.1.1 Supply Fan Operating

HVAC system outside air, return air, and relief air dampers shall function

as described for specific modes of operation unless control of the dampers is assumed by the fire and smoke control system. Smoke dampers shall open before fans are allowed to start. Interlocked exhaust fans shall be stopped in the unoccupied and ventilation delay modes and their dampers shall be closed. Interlocked exhaust fans shall run in the occupied mode, and their dampers shall open. Cooling coil control valves and cooling coil circulating pumps shall function as described for the specific modes of operation unless their control is assumed by the freeze protection system. Heating coil valves shall be under control and normally open.

3.3.1.2 Supply Fan Not Operating

When an HVAC system is stopped, all interlocked fans shall stop,the smoke dampers shall close, the outside air and relief air dampers shall close, the return air damper shall open, all stages of direct-expansion cooling shall stop, the system shall pump down if it has a pump down cycle, humidification shall stop, and cooling coil valves for coils located indoors shall close to the coil. Cooling coil valves of units located outdoors shall open to the coil. Heating coil valves shall remain under control.

3.3.1.3 Hydronic Heating - Distribution Pump Operating

Hydronic heat-exchanger valves shall be under control.

3.3.1.4 Hydronic Heating - Distribution Pump Not Operating

Hydronic heat-exchanger valves shall close.

3.3.2 Perimeter Radiation Control Sequence

All Modes - A room thermostat, located as shown, shall operate a control valve to maintain the setpoint as shown.

3.3.3 Unit Heater and Cabinet Unit Heater

All Modes - A wall-mounted thermostat with an "AUTO-OFF" switch located as shown, shall cycle the fan to maintain its setpoint as shown when the switch is in the "AUTO" position. When the switch is in the "OFF" position, the fan shall be stopped.

3.4 NOT USED

3.5 BALANCING, COMMISSIONING, AND TESTING

3.5.1 Coordination with HVAC System Balancing

Commissioning of the control system, except for tuning of controllers, shall be performed prior to or simultaneous with HVAC system balancing. The contractor shall tune the HVAC control system after all air system and hydronic system balancing has been completed, minimum damper positions set and a report has been issued.

3.5.2 Control System Calibration, Adjustments, and Commissioning

Control system commissioning shall be performed for each HVAC system, using test plans and procedures previously approved by the Government. The Contractor shall provide all personnel, equipment, instrumentation, and supplies necessary to perform commissioning and testing of the HVAC control

system. All instrumentation and controls shall be calibrated and the specified accuracy shall be verified using test equipment with calibration traceable to NIST standards. Wiring shall be tested for continuity and for ground, open, and short circuits. Mechanical control devices shall be adjusted to operate as specified. HVAC control panels shall be pretested off-site as a functioning assembly ready for field connections, calibration, adjustment, and commissioning of the operational HVAC control system. Control parameters and logic (virtual) points including control loop setpoints, gain constants, and integral constraints, shall be adjusted before the system is placed on line. Communications requirements shall be as indicated. Written notification of any planned commissioning or testing of the HVAC Control systems shall be given to the Government at least 14 calendar days in advance.

3.5.3 Performance Verification Test

The Contractor shall demonstrate compliance of the HVAC control system with the contract documents. Using test plans and procedures previously approved by the Government, the Contractor shall demonstrate all physical and functional requirements of the project. The performance verification test shall show, step-by-step, the actions and results demonstrating that the control systems perform in accordance with the sequences of operation. The performance verification test shall not be started until after receipt by the Contractor of written permission by the Government, based on Government approval of the Commissioning Report and completion of balancing. The tests shall not be conducted during scheduled seasonal off periods of base heating and cooling systems.

3.5.4 Not Used

3.5.5 Posted and Panel Instructions

Posted and Panel Instructions, showing the final installed conditions, shall be provided for each system. The posted instructions shall consist of laminated half-size drawings and shall include the control system schematic, equipment schedule, sequence of operation, wiring diagram, communication network diagram, and valve and damper schedules. The posted instructions shall be permanently affixed, by mechanical means, to a wall near the control panel. Panel instructions shall consist of laminated letter-size sheets and shall include a Routine Maintenance Checklist and as-built configuration check sheets. Panel instructions and one copy of the Operation and Maintenance Manuals, previously described herein, shall be placed inside each control panel or permanently affixed, by mechanical means, to a wall near the panel.

3.6 TRAINING

3.6.1 Training Course Requirements

A training course shall be conducted for 10 operating staff members designated by the Contracting Officer in the maintenance and operation of the system, including specified hardware and software. The training period, for a total of 32 hours of normal working time, shall be conducted within 30 days after successful completion of the performance verification test. The training course shall be conducted at the project site. Audiovisual equipment and 10 sets of all other training materials and supplies shall be provided. A training day is defined as 8 hours of classroom instruction, including two 15 minute breaks and excluding

lunchtime, Monday through Friday, during the daytime shift in effect at the training facility.

3.6.2 Training Course Content

For guidance in planning the required instruction, the Contractor shall assume that attendees will have a high school education or equivalent, and are familiar with HVAC systems. The training course shall cover all of the material contained in the Operating and Maintenance Instructions, the layout and location of each HVAC control panel, the layout of one of each type of unitary equipment and the locations of each, the location of each control device external to the panels, the location of the compressed air station, preventive maintenance, troubleshooting, diagnostics, calibration, adjustment, commissioning, tuning, and repair procedures. Typical systems and similar systems may be treated as a group, with instruction on the physical layout of one such system. The results of the performance verification test and the calibration, adjustment and commissioning report shall be presented as benchmarks of HVAC control system performance by which to measure operation and maintenance effectiveness.

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ATTACHMENT NO. 4

PAVEMENT CALCULATION SHEETS

RIGID PAVEMENT DESIGN
(Non-Reinforced)

(The use of this form does not preclude compliance with all requirements of AFM 88-7, Chap. 1 and AFM 88-7, Chap. 5)

1. **STRENGTH DESIGN**.

1.1. Class = ____ (Table 1 or 2 in AFM 88-7, Chap. 5)

1.2. Category = ____ (Chapter 3 of AFM 88-7, Chap. 1)

1.3. Design Index = ____ (Table 3-1 of AFM 88-7, Chap. 1)

1.4. Modulus of Soil Reaction (Subgrade)= k = ____ pci (If test results are not available, refer to Table 9-1 of AFM 88-7, Chap. 1, for typical values).

1.5. Concrete 28-day flexural strength = ____ psi (650 psi)

1.6. If a base course is not required under rigid pavement, pavement thickness shall be determined using the subgrade modulus of soil reaction, k.

Pavement Thickness = ____ inches (Figures 12-1 and 12-2 of AFM 88-7, Chap. 1)

1.7. If a base course is required under rigid pavement; pavement thickness shall be determined using the following interactive process whereby the total base course thicknesses are assumed and the effective modulus of soil reaction on top of the base is determined. Effective K values are used to determine the required pavement thickness.

Trial Number	Assumed Base Course Thickness	Effective Soil Reaction (Fig. 9-1 of AFM 88-7, Chap. 1)	(**) Pavement Thickness (Fig. 12-1 or Fig. 12-2 of AFM 88-7, Chap. 1
1			
2			
3			
4			

(**) Effective Soil Reaction from Fig. 9-1 of AFM 88-7, Chap. 1, will be used for the K value in Figure 12-1 or 12-2.

RIGID PAVEMENT DESIGN
(Non-Reinforced)

Pavement Thickness = ____ inches

Total Base Course Thickness = ____ inches *

* Note: The minimum base course thickness is 4 inches.

1.8 Compacted Subgrade Thickness = ____ inches (Chapter 9 of AFM 88-7, Chap. 1)

2. **FROST DESIGN**.

2.1. Reduced Subgrade Strength Method. (Exception from the full thickness requirements of the limited subgrade penetration design method is not permitted where subgrade soils are group F4 under adverse moisture conditions.)

2.1.1. Design Index = ____ (from paragraph 1.3. above)

2.1.2. Concrete 28-day flexural strength = ____ psi (from paragraph 1.5. above)

2.1.3. Soil Group = ____ (From Soils Report or Table 18-2 of AFM 88-7, Chap. 1)

2.1.4. The following is an interactive process whereby the total base course thicknesses are assumed and frost-area indices of reaction are determined. These values are used to determine the required pavement thickness. In no case should the frost-area index of reaction exceed the value of K in paragraph 1.4. used for the strength design.

Trial Number	Assumed Base Course Thickness	Frost-area Index of Reaction (Fig. 18-5 of AFM 88-7, Chap. 1)	(**) Pavement Thickness (Fig. 12-1 or Fig. 12-2 of AFM 88-7, Chap. 1)
1			
2			
3			
4			

(**) Frost-area Index of Reaction from Fig. 18-5 of AFM 88-7, Chap. 1, will be used for the K value in Figure 12-1 or 12-2.

Pavement thickness = ____ inches.

Total Base Course Thickness = ____ inches.

RIGID PAVEMENT DESIGN
(Non-Reinforced)

Note: The values above should represent the least expensive combination of base course and pavement thicknesses shown in the Table in paragraph 2.1.4. above. The combined thickness of all base courses shall be at least equal to the slab thickness, except as outlined in paragraph 18-7 (b) of AFM 88-7, Chap. 1. The minimum base course thickness is 4 inches.

2.1.5 Depth of Subgrade Preparation = ____ inches
(Para 18-17 of AFM 88-7, Chap. 1).

If existing subgrade soils are relatively homogeneous with uniform frost susceptibility or the exceptions in paragraph 18-17a of AFM 88-7, Chap. 1 are applicable, the subgrade requirements in paragraph 18-17 of AFM 88-7, Chap. 1 shall not be required. The compacted subgrade thickness shall be in accordance with Chapter 9 of AFM 88-7, Chap. 1.

3. **FINAL PAVEMENT SECTION**. The Strength Design method shall be used to determine the final pavement design in areas with non-frost-susceptible subgrade soils and in areas where frost will not penetrate into the subgrade. For all other areas, the final pavement design shall be determined using the greater pavement thickness obtained by either the Strength Design method or the Frost Design method.

Concrete Pavement thickness = ____ inches. (6" min.)

Rigid Base Course Thickness = ____ inches. (4" min.)

Compacted Subgrade Thickness = ____ inches.

FLEXIBLE PAVEMENT DESIGN

(The use of this form does not preclude compliance with all requirements of AFM 88-7, Chap. 1 and AFM 88-7, Chap. 5).

1. **STRENGTH DESIGN**.

1.1. Class = ____ (Table 1 or 2 in AFM 88-7, Chap. 5)

1.2. Category = ____ (Chapter 3 of AFM 88-7, Chap. 1)

1.3. Design Index = ____ (Table 3-1 of AFM 88-7, Chap. 1)

1.4. CBR (compacted subgrade) = ____ (If test results are not available, refer to Page 8-3 of AFM 88-7, Chap. 1, for typical values)

1.5. Design Thickness = ____ inches (Figure 8-1 of AFM 88-7, Chap. 1)

1.6 Compacted Subgrade Thickness = ____ inches (Table 4-1 of AFM 88-7, Chap. 1)

2. **FROST DESIGN**.

2.1. Reduced Subgrade Strength Method. (Exception from the full thickness requirements of the limited subgrade frost penetration design method is not permitted where subgrade soils are group F4 under adverse moisture conditions.)

2.1.1. Design Index = ____ (From paragraph 1.3. above)

2.1.2. Soil Group = ____ (From Soils Report or Table 18-2 of AFM 88-7, Chap. 1)

2.1.3. Soil Support Index = ____ (Table 18-3 of AFM 88-7, Chap. 1)

2.1.4. Design Thickness (**) = ____ inches (Figure 8-1 of AFM 88-7, Chap. 1)

(**) Soil Support Index from Table 18-3 of AFM 88-7, Chap. 1, will be used for the CBR value in figure 8-1.

FLEXIBLE PAVEMENT DESIGN

2.1.5 Depth of Subgrade Preparation = ____ inches (Para 18-17 of AFM 88-7, Chap. 1).

If existing subgrade soils are relatively homogeneous with uniform frost susceptibility or the exceptions in paragraph 18-17a of AFM 88-7, Chap. 1 are applicable, the subgrade requirements in paragraph 18-17 of AFM 88-7, Chap. 1 shall not be required. The compacted subgrade thickness shall be in accordance with Chapter 4 of AFM 88-7, Chap. 1.

3. **FINAL PAVEMENT SECTION**. The Strength Design method shall be used to determine the final pavement design in areas with non-frost-susceptible subgrade soils and in areas where frost will not penetrate into the subgrade. For all other areas, the final pavement design shall be determined using the greater pavement thickness obtained by either the Strength Design method or the Frost Design method.

Bituminous Surface Course thickness = ____ inches. (2" min.)
Bituminous Tack Coat
Bituminous Intermediate Course = ____ inches. (2" min.)
Bituminous Prime Coat
Aggregate Base Course Thickness = ____ inches. (4" min.)
Subbase Course Thickness = ____ inches. (4" min.)
Compacted Subgrade Thickness = ____ inches.

ATTACHMENT NO. 5

RFP Drawings
(Included on the CD-ROM)

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