REQUEST FOR PROPOSAL
IDIQ DESIGN/BUILD CONTRACT
Solicitation: DACA45-03-R-0014

REPLACE FAMILY HOUSING
Phase 3 - Task Order No. 1
Project FXBM994504

ELLSWORTH AFB, South Dakota

APRIL 2003

Air Combat Command

U.S. Army Corps of Engineers,
Omaha District

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REQUEST FOR PROPOSAL REQUIREMENTS
FOR

REPLACE FAMILY HOUSING, PHASE 3

ELLSWORTH AFB, SOUTH DAKOTA

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ATTACHMENTS

SOLICITATION, OFFER, AND AWARD (Construction, Alteration, or Repair)	1. SOLICITATION NO.	2. TYPE OF SOLICITATION	3. DATE ISSUED	PAGE OF PAGES
	DACA45-03-R-0014	☐ SEALED BID (IFB) ☒ NEGOTIATED (RFP)	29 APR 2003	1 OF 2

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

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

SOLICITATION

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

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

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

INDEFINITE DELIVERY CONTRACT
REPLACE FAMILY HOUSING
FY 04 - FY 10
ELLSWORTH AFB, SD

RETURN ONLY UPON WRITTEN REQUEST BY THE GOVERNMENT TO SUBMIT PHASE 2 PROPOSALS. REFERENCE SECTION 00110, PROPOSAL SUBMISSION AND EVALUATION

*** 11. See Section 00110: PROPOSAL SUBMISSION AND EVALUATION for Schedule Requirements.**
**** 13D & 17. The Government intends to make award on or before 15 FEB 2004.**
***** 13A See Section 00110: PROPOSAL SUBMISSION AND EVALUATION for number of copies.**

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

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

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

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and *** copies to perform the work required are due at the place specified in Item 8 by 1400 (hour) local time 04 JUN 2003 (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 ** 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 ** calendar days after the date offers are due. (Insert any number equal to or greater than the minimum requirement stated in Item 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.)

AMOUNTS ▶ See Attached PRICING SCHEDULE (Pages 00010TO1) for Task Order No. 1 Items.

Contractor's Fax No._____ CAGE CODE _____

Contractor's E-Mail address_____

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

19. ACKNOWLEDGMENT OF AMENDMENTS

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

AMENDMENT NO.										
DATE										

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

AWARD (To be completed by Government)

21. ITEMS ACCEPTED:

22. AMOUNT	23. ACCOUNTING AND APPROPRIATION DATA

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

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

CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

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

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

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

PRICING SCHEDULE (TASK ORDER NO. 1)

PHASE 3 - PART A SCHEDULE (HOUSING UNITS)					
A	**B**	**C**	**D**	**E**	**F**
Item No.	**Description**	**GSF / Unit**	**Total GSF No. of Units x Column C**	**Unit Price Cost/GSF**	**Total Amount Columns D x E**
0001	**All work Complete for 8 -Three-Bedroom JNEL Housing Units** **(Construction Cost Only)**	_____	_____	**$**_____	**$**_____
0002	**All work Complete for 30 -Three Bedroom SNCO Housing** **(Construction cost only)**	_____	_____	**$**_____	**$**_____
0003	**All work Complete for 25 - Four Bedroom JNEL Housing Units (** **(Construction cost only)**	_____	_____	**$**_____	**$**_____
0004	**All work Complete for 12 - Four Bedroom SNCO Housing** **(Construction cost only)**	_____	_____	**$**_____	**$**_____
0005	**DESIGN COST FOR ITEMS 0001 - 0004**				**$**_____

PHASE 3 - PART B SCHEDULE (DEMO/ SITE / UTILITIES)				
A	**B**	**C**	**D**	**E**
Item No.	**Description**	**Quantity**	**Unit Price Cost/Unit**	**Total Amount Columns C x D**
0006	**Complete Demolition of 40 existing duplexes (80 units) (including but not limited to removal of asbestos, LBP, utilities, foundations, etc.) See Section 01000 Part 4, SITE for additional information.** **TOTAL ITEM NO. 0006 Demolition Cost**	**80 Units**	**$_____**	**$_____**
0007	**Entire Work Complete for Phase 3 Infrastructure; includes all common area and lots for electrical distribution; sanitary sewer; water main; storm sewer; gas; laterals; grading; sidewalks; playgrounds; common landscaping; and street replacement. (Construction Only)** **TOTAL ITEM NO. 0007 Infrastructure Construction Cost**	**Job**	**Lump Sum**	**$_____**
0008	**DESIGN COST FOR ITEMS 0006 & 0007**			**$_____**
TOTAL AMOUNT: PHASE 3 (PART A + B)				
0009	**TOTAL CONSTRUCTION COST FOR PHASE 3 (ITEMS 0001 + 0002 + 0003 + 0004 + 0006 + 0007)**			**$_____**
0010	**TOTAL DESIGN COST FOR PHASE 3 (ITEMS 0005 + 0008)**			**$_____**
0011	**GRAND TOTAL AMOUNT FOR PHASE 3 (ITEMS 0009 + 0010)**			**$_____**

a) **Contractor authorizes the work above to be completed in _____ calendar days from NTP.**
b) **Office Overhead _____%**
c) **Profit _____%**
d) **Bonding _____%**

Signature of Authorized Company Principal

NOTES:

1. Prices must be entered for all line items on the Pricing Schedule. Grand total amount price submitted (Line 0011) without prices for individual line items will not be evaluated. The Contractor's addition will be subject to verification by the Government. In case of variation between an individual item price and the grand total amount, the individual item price will be considered the price. The terms "Construction Cost" and "Design Cost", noted above, includes everything required to complete the work, including associated profits and fees.

2. 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 option(s), should state the application of the adjustment to each respective individual item price affected. If the modification is not so apportioned the Pricing Schedule item will not be evaluated.

3. The completion time and percentage blanks listed in a) through d) shall be filled in by the Proposer. Items b) through d) shall indicate percentages used in pricing items for Task Order No. 1. It is the Government's intention to use the prices given within this Pricing Schedule (Task Order No. 1) and the percentages indicated above by the "successful" Proposer to negotiate future Task Orders. See Section 00110: PROPOSAL SUBMISSION AND EVALUATION for information on Volume III PRICE.

4. Unit Construction and Design prices are to include all work required within 5 feet outside the building lines plus patios, driveways, unit sidewalks (exclude common ground sidewalks along streets and common pathways, which are considered infrastructure).

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SECTION 00100
INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS

INDEX

SECTION 00100

INSTRUCTIONS, CONDITIONS AND NOTICES TO OFFERORS

1 "TWO-PHASE DESIGN-BUILD SELECTION" 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 Offeror. "Two-Phase Design-Build Selection Procedures" are described in FAR Subpart 36.3 and refer to a solicitation accomplished in two (2) phases. Phase 1 consists of an evaluation of proposals for technical approach, technical qualifications, past performance, and capability to perform the contract requirements. Phase 2 consists of a detailed evaluation of proposals for management approach, concept design, project specific plans, and price. Only those Offerors who are evaluated as the most highly qualified in Phase 1 will be requested to submit proposals in Phase 2. No more than five (5) Offerors will be requested to submit proposals in Phase 2. Proposal requirements and submittal requirements for both Phase 1 and Phase 2 are included in this solicitation.

1.1 PHASE 2 OF THE DESIGN BUILD PROCESS

Phase 2 of the Design-Build Process outlined above contains the criteria for the overall indefinite delivery contract, which will be awarded for a 5-year base period with an option to extend the contract for another 5-year period. The contract is not to exceed $100,000,000 (See Section 00800 for Minimum contract amounts and obligations). FY04, Phase 3, the first year of the base contract, also known as Task Order No.1, is also included within Phase 2 criteria.

1.2 DESIGN/CONSTRUCTION COST LIMITATION (DCCL) FOR TASK ORDER No. 1

The award for design and construction of Phase 3 (Task Order No. 1) will be subject to the funds available. The Design and Construction Cost Limitation (DCCL) for Phase 3 (PN: FXBM994504) is $15,236,000. The Government reserves the right to reject any proposals that exceed the given DCCL.

1.3 WHO MAY SUBMIT

This solicitation is unrestricted (not limited to small business concerns).

1.3.1 PROPOSALS MAY BE SUBMITTED BY:

(a) Firms formally organized as design-build entities, or by design firms and construction contractors that have formed a team specifically for this project, or any other interested party. In the latter case, a single design firm or construction contractor may offer more than one proposal by entering into more than one such association. ***Firms are encouraged to team with small business concerns for this project***. For the purpose of this solicitation, no distinction is made between formally organized design-build entities and project specific design-build associations. Both are referred to as "Offeror" or "Contractor" in this solicitation and resulting contract.

(b) Any legally organized Offeror may submit a proposal, provided that the Offeror, or Offeror's subcontractor, have on its permanent staff professional architects and engineers registered in the appropriate technical disciplines and the requirements specified in the solicitation are met. All designs shall be under the direct supervision of appropriately licensed professionals.

1.4 GENERAL REQUIREMENTS

In order to effectively and equitably evaluate all proposals, the Contracting Officer must receive information sufficiently detailed to clearly indicate the proposal requirements. All proposals submitted will become

upon receipt, the property of the U.S. Government and not be returned. If the Offeror desires to withdraw its proposal, all copies except the original will be retained. The original will be returned in accordance with the requirements stated in FAR Clause 52.215-1, Section 00100, Paragraph 5, herein.

2 (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)

3 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)

4 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.

5 (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)

6 (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)

7 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.

8 NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS)

In accordance with Subsector 233 of the NAICS Manual, the work in this solicitation is assigned classification code 233210.

9 52.228-1 -- BID GUARANTEE (SEP 1996)

(a) Failure to furnish a guarantee in the proper form and amount, by the time set for receipt of proposals, may be cause for rejection of the proposal.

(b) The offeror shall furnish a guarantee in the form of a firm commitment, e.g., bid bond supported by good and sufficient surety or sureties acceptable to the Government, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States. The Contracting Officer will return bid guarantees, other than bid bonds --

(1) To unsuccessful offerors as soon as practicable after the receipt of proposals; and

(2) To the successful offeror upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the offer as accepted.

(c) The amount of the guarantee shall be 20% percent of the price or $3,000,000, whichever is less.

(d) If the successful offeror, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or furnish executed bond(s) within 10 days after receipt of the forms by the offeror, the Contracting Officer may terminate the contract for default.

(e) In the event the contract is terminated for default, the offeror is liable for any cost of acquiring the work that exceeds the amount of its proposal, and the guarantee is available to offset the difference.

(End of Provision)

10 (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)

11 (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)

12 (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.

13 (FAR 52.236-27) SITE VISIT (CONSTRUCTION) (FEB 1995) FOR PHASE II PARTICIPANTS

(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 Ellsworth AFB on 8 July 2003 from 9:00 a.m. until noon. Assembly will take place in the Officer's Club. The conference will begin at 9:00 a.m. addressing project questions and discussion and last until 11:00 a.m. The site visit is scheduled from 11:00 a.m. until noon. For information on base access and scheduling your Pre-Proposal visit, contact the following: Ellsworth AFB Resident Engineer, U.S. Army Corps of Engineers, P.O. Box 669, Bldg 8201, Box Elder, SD 57719, Telephone: (605) 923-2983. FAX (605) 923-2558.

The purpose of the conference will be to familiarize Offerors with the extent and nature of the project as well as unique features of this solicitation. The conference will begin with an introductory session by Government Representatives, which will be followed by a question and answer period. Prospective Offerors shall submit written questions (prefer in advance of the conference), so prepared answers can be delivered during the conference. Questions shall be forwarded to the address located in Block 8 of Standard Form 1442 or faxed to the phone number stated in paragraph: OFFEROR'S QUESTIONS AND COMMENTS. A written summary of the questions and answers will be provided to each Offeror on the Offeror/Bidder list (For Information Only). Remarks and explanations at the conference shall not qualify the terms of the solicitation. Terms of the solicitation and specifications remain unchanged unless the solicitation is amended in writing.

14 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 (limit One per firm)/ amendments**/ Receipt of Proposals	Mel Vogt 402-221-4109(phone) 402-221-4530 (fax)	mel.e.vogt@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	John Stobbe 402-221-3985 (phone) 402-221-4828 (fax)	john.j.stobbe@usace.army.mil
CD-ROM	Specifications Section Michael Pisci 402-221-4413 (phone) 402-221-3842 (fax)	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.**

14.1 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/

15 GENERAL DESCRIPTION OF WORK

Scope of project includes all work required to design and construct Multi-Family Housing Units located at Ellsworth AFB, SD for a 5-year base period with an option to extend the contract for another 5-year period. Work for Task Order No. 1 (also known as FY04, Phase 3 of this Ellsworth Housing Program) shall be in accordance with the Request for Proposal requirements pertaining to Task Order No. 1 and issued as part of the solicitation. The FY04, Task Order No. 1, Phase 3 work consists of the Basic demolition of 80 existing living units (40 duplexes) and providing replacement with 75 new living units (37, 3BR and 4BR duplexes plus one 4 BR single unit.

16 PROPOSAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS.

See Section 00110 PROPOSAL SUBMISSION AND EVALUATION for submission of Phase 1 and Phase 2 requirements.

17 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.

18 PROPOSAL EVALUATION AND CONTRACT AWARD

See Section 00110 PROPOSAL SUBMISSION AND EVALUATION for evaluation of Phase 1 and Phase 2 requirements.

19 TAXES - STATE OF SOUTH DAKOTA

19.1 EXCISE TAX

There is an excise tax on the total gross receipts of all prime contractors and subcontractors engaged in realty improvement contracts.

19.2 USE TAX

Government furnished construction material used by the Contractor in the performance of the work is subject to use tax. The value of the material furnished is set forth in the SECTION 00800, SPECIAL CONTRACT REQUIREMENTS clause "Government-Furnished Property."

19.3 INFORMATION

The "excise" and "use" taxes shall be included in the price or prices bid. For information concerning the taxes contact: Sales and Use Tax Division, Capital Lake Plaza, Pierre, South Dakota. Telephone 605-773-3311.

20 (FAR 52.232-18) AVAILABILITY OF FUNDS (APR 1984)

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

REQUIRED CENTRAL CONTRACTOR REGISTRATION (CCR)

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

Register One of Three Ways:

Internet: http://www.ccr.gov

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

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

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

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SECTION 00110
DACA45-03-R-0014
PROPOSAL SUBMISSION AND EVALUATION

INDEX

ATTACHMENTS:

PERFORMANCE SUMMARY SHEETS (CONSTRUCTION)
PERFORMANCE SUMMARY SHEETS (DESIGN)
NET AREA CALCULATION WORKSHEETS
CONSTRUCTION MATERIALS, PRODUCTS, EQUIPMENT AND SYSTEMS

DACA45-03-R-0014
PROPOSAL SUBMISSION AND EVALUATION

1 PROPOSAL SUBMISSION

See also FAR Clause 52.215-1, Section 00100, INSTRUCTIONS TO OFFERORS—COMPETIVE ACQUISITION.

1.1 WHERE TO SUBMIT

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

1.2 SUBMISSION DEADLINE

1.2.1 PHASE 1 SUBMISSION DEADLINE

Offers should be submitted by 1400 local time on June 4, 2003 at the place specified in Section 00010, Page 1, Item 8.

Due to heightened security at Government installations, those Offerors who have their proposals hand-delivered should contact Mel Vogt, Contract Specialist at (402) 221-4298 or (402) 221-4100 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 the specified time on the current Standard Form SF 1442, Page 00010-1, Item 13A, a Contracting Representative will be in the lobby to receive proposals. At 1400 local time, it will be announced that receipt of proposals is closed. Official time will be established by time/stamp clock located in the area where proposals are received." Any proposal received after this time will be considered as a late proposal and will not be evaluated unless FAR requirements of 52.215-1 have been met concerning late bids/proposals.

1.2.2 PHASE 2 SUBMISSION DEADLINE

Submission deadlines and procedures will be included with the request to submit Phase 2 proposals. Proposals from Offerors who were not requested to submit Phase 2 proposals will not be considered.

2 PROPOSAL REQUIREMENTS AND FORMAT

2.1 PROPOSAL FORMAT

All proposals should contain the evaluation requirements stated herein. All written information and data shall be in an 8 ½" x 11" format and shall be provided in a standard 3–ring binder. Every binder shall contain: Table of Contents, List of Tables or Figures (if required) and List of Appendixes. Contents

shall follow the order of the evaluation criteria and pages shall be numbered. Only written proposals will be accepted. Oral, electronic, and facsimile proposals will not be accepted.

Firms submitting proposals should 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 RFP. Data submitted must reflect the designer's interpretation of criteria contained in the RFP. Unnecessarily elaborate or voluminous brochures or other presentations, beyond those sufficient to present a complete and effective response, are not desired and may be construed as an indication of the firm's lack of cost-consciousness. Elaborate artwork, expensive paper and bindings, and expensive/extensive visual and other presentation aids are unnecessary.

Technical proposals will be evaluated for conformance with the minimum RFP criteria, and for the extent to which they exceed those criteria. While the intent is to keep the pre-award design effort to a minimum, proposals must provide adequate detail for evaluators to determine how the proposals meet or exceed the RFP criteria. It must also form sufficient basis for a fair and reasonable price proposal.

Proposal clarity, organization (as stated in this solicitation) and cross-referencing are mandatory. No material (information not part of proposal) shall be incorporated by reference. A proposal that does not conform to these requirements shall be considered non-responsive and the proposal returned to the Offeror.

2.2 PHASE 1 PROPOSAL FORMAT

All Phase 1 proposals should be submitted in one binder labeled as Volume I with tabs separating the factors. The evaluation factors in Phase 1 and their relative importance are listed in descending order in the table below (with the exception of Tab 1 CONTRACTUAL DOCUMENTS, which is not part of the formal evaluation). Sub-factors within each factor are listed in descending order of importance. The original plus 6 copies of Volume I should be submitted.

TABLE 1
PHASE 1 PROPOSAL FORMAT

VOLUME/TAB	EVALUATATION FACTOR/SUBFACTOR	RELATIVE IMPORTANCE
Volume I, Tab 1	Contractual Documents A. Cover Letter B. Section 00600 C. Bonding	Acceptable/Unacceptable
Volume I, Tab 2	Experience (Construction & Design) A. Construction Experience B. Design Experience	Significantly more important than Tab 6. Slightly more important than Tabs 5 and 10. Approximately equal to Tabs 3, 4, 8 and 9. Slightly less important than Tab 7.
Volume I, Tab 3	Past Performance (Construction & Design) A. Construction Past Performance B. Design Past Performance	Significantly more important than Tab 6. Slightly more important than Tabs 5 and 10. Approximately equal to Tabs 2, 4, 8 and 9. Slightly less important than Tab 7.
Volume I, Tab 4	Program Management Plan (Overall Technical Approach)	Significantly more important than Tab 6. Slightly more important than Tabs 5 and 10. Approximately equal to Tabs 2, 3, 8, and 9. Slightly less important than Tab 7.
Volume I, Tab 5	Personnel A. Construction Personnel B. Design Personnel C. Other Professional Personnel	Slightly more important than Tab 6. Approximately equal to Tab 10. Slightly less important than Tabs 2, 3, 4, 8, and 9. Significantly less important than Tab 7.
Volume I, Tab 6	Past Performance (Utilization of Small Business Concerns)	Slightly less important than Tab 5 and 10. Significantly less important than Tabs 2, 3 4, 7, 8, and 9.

2.3 PHASE 2 PROPOSAL FORMAT

All Phase 2 proposals, except for drawings, should be submitted in two 3-ring binders labeled as Volume II and Volume III with tabs separating the factors shown on the table below. All drawings

submitted shall be half size drawings. Firms are encouraged to prepare drawings for proposal submission using guidelines presented in Section 01332, SUBMITTALS DURING DESIGN. However, to minimize effort expended by the firms, other formats will be accepted so long as requested information is provided. In either case, firms are encouraged to provide INFORMATIVE DRAWING NOTES to convey important features of their design. Drawing information should present basic concepts, arrangements, and layouts. Arrangements, layout plans, and notes may be combined together on single sheets in order to simplify presentation, so long as clarity is maintained. Drawings are not intended to be construction detail plans. The original plus 6 copies of Volume II should be submitted.

TABLE 2
PHASE 2 PROPOSAL FORMAT

VOLUME/TAB	EVALUATATION FACTOR/SUBFACTOR	RELATIVE IMPORTANCE
Volume II, Tab 7	Housing Unit Concept Design A. Housing Unit Design B. Supporting Data Housing Unit Design	Significantly more important than Tabs 5, 6, and 10. Slightly more important than Tabs 2, 3, 4, 8 and 9.
Volume II, Tab 8	Site Concept Design A. Site Design B. Demolition Plan C. Supporting Data Site Design	Significantly more important than Tab 6. Slightly more important than Tabs 5 and 10. Approximately equal to Tabs 2, 3, 4 and 9. Slightly less important than Tab 7.
Volume II, Tab 9	Project Management A. Project Management Plan B. Project Schedule C. Health & Safety Record	Significantly more important than Tab 6. Slightly more important than Tabs 5 and 10. Approximately equal to Tabs 2, 3, 4, and 8. Slightly less important than Tab 7.
Volume II, Tab 10	Utilization of Small Business Concerns* A. Subcontracting Floors B. Mitigation Efforts C. Utilization of Small Business Concerns D. Description of Subcontracted Supplies & Services E. Acknowledgements	Slightly more important than Tab 6. Approximately equal to Tab 5. Slightly less important than Tabs 2, 3, 4, 8, and 9. Significantly less important than Tab 7.
Volume III	Price A. Cover Letter B. SF 1442 & Section 00010 C. Guarantee	Approximately equal to the combined importance of all other evaluation factors (Volumes I & II). Note: Volumes I and II are of approximately equal importance to each other.

* *Applies to Large Businesses Only*

3. EVALUATION OF PROPOSALS

a) All proposals and documentation, which have been properly submitted, will be evaluated. Two-phase design-build source selection procedures in FAR Subpart 36.3 will be used. Proposals received will be evaluated on the basis of the factors stated in the solicitation to select the responsible Offeror whose proposal presents the best value and is most advantageous to the Government. Because of the number of proposals anticipated, uniformity of all proposals is essential to assure fair and accurate evaluation. All proposals are required to comply with the instructions in the solicitation outlined and its supplements will be utilized.

b) The Government intends to evaluate Phase 1 proposals without discussions with Offerors. Only the most highly qualified firms (no more than 5) will be requested to submit proposals in Phase 2. The Government also reserves the right to enter into discussions if determined to be in the Government's best interests. Discussions initiated by the Government with owners, contract administrators, or other points of contact, provided by the Offeror may affect the evaluation rating given for the factors being evaluated by those discussions.

c) The Government reserves the right to evaluate Phase 2 proposals and make award without discussions. Therefore, the Offeror's Phase 2 proposal should contain the Offeror's best terms from a cost or price and technical standpoint. The Government also reserves the right to enter into discussions if it is determined to be in the Government's best interest. Discussions initiated by the Government with owners, contract administrators, or other points of contact, provided by the Offeror may affect the evaluation rating given for the factors being evaluated by those discussions.

d) The Government will conduct evaluations in accordance with the Tradeoff Process in FAR Subpart 15.101-1. Volume I (Phase 1) and Volume II (Phase 2 excluding PRICE) will be rated using an adjectival rating with a narrative assessment. Volume III (PRICE) will not have an adjectival rating and will be evaluated separately after consensus evaluations of Volumes I and II have been completed. Proposal evaluation is an assessment of the proposal and the Offeror's ability to perform the resulting contract successfully. Proposals will be evaluated to determine ratings supported by narratives, and to identify strengths, weaknesses, and deficiencies of the proposed approach in each proposal.

e) Evaluation Definitions.

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

(2) Weakness. A flaw in the proposal that increases the risk of unsuccessful contract performance (i.e., meets the RFP requirements, but may have an impact on schedule or quality requirements). A ***weakness need not be corrected*** for a proposal to be considered for award, but ***may*** affect the offeror's rating.

(3) Deficiency. A material failure of a proposal to meet the Government requirement or a combination of significant weaknesses in a proposal that increase the risk of contract performance at an unacceptable level. A deficiency ***must be corrected*** for a proposal to be considered for award.

(4) Clarification. Clarifications are limited exchanges between the Government and Offerors that may occur when award without discussions is contemplated. If award without discussions is

anticipated, Offerors may be given the opportunity to clarify certain aspects of their proposals (for example, the relevance of an offeror's past performance information and adverse past performance information to which the offeror has not previously had an oppoutunity to respond) or to resolve minor or clerical errors without material changes to their proposal. Clarifications do not provide an offeror the opportunity to revise or modify its proposal, except for correction of apparent clerical mistakes that would ultimately result in a revision. All clarifications shall be conducted through the Contracting Officer. (See FAR 15.306(a).)

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

(6) Exchanges. Negotiations are exchanges, in either a competitive or sole source environment, between the Government and offerors that are undertaken with the intent of allowing the offeror to revise its proposal. These negotiations may include bargaining. Bargaining includes persuasion, alteration of assumptions and positions, give-and-take, and may apply to price, schedule, technical requirements, type of contract, or other terms of a proposed contract. When negotiations are conducted in a competitive acquisition, they take place after establishment of the competitive range and are called **discussions**.

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

(8) Rating. The application of a scale of words, or colors, used in conjunction with narrative, to denote the degree to which the proposal has met the standard for a non-cost factor. For purposes of this solicitation, ratings will consist of words (adjectival method) used in conjunction with narratives. Ratings will be applied at the factor (tab) and sub-factor level. If at any level of indentation an Offeror's proposal is evaluated as not meeting a minimum requirement (that is, below the level of Satisfactory), this fact may be included in the rating and narrative assessment at that level and each higher level of indentation. Therefore, a Marginal or Unacceptable rating at any level may be carried to the factor (tab) level. The following ratings will be used to evaluate Volume I and Volume II, in addition the ratings can be denoted with "+" and "-" signs after the rating to further make distinctions between more superior to less superior factors within a rating (e.g. "Above Average +" outperforms the "Above Average – rating).

(i.) **Outstanding -** Information submitted demonstrates offeror's potential to significantly exceed performance or capability standards. The offeror has clearly demonstrated an understanding of all aspects of the requirements to the extent that timely and highest quality performance is anticipated. Have exceptional strengths that will significantly benefit the Government. The offeror's qualifications exceed the fullest expectations of the Government. The offeror has convincingly demonstrated that the RFP requirements have been analyzed, evaluated, and synthesized into approaches, plans, and techniques that, when implemented, should result in outstanding, effective, efficient, and economical performance under the contract. Significantly exceeds most or all solicitation requirements. **Very high probability of success.**

(ii.) **Above Average -** Information submitted demonstrates offeror's potential to exceed performance or capability standards. Have one or more strengths that will benefit the

Government. The areas in which the offeror exceeds the requirements are anticipated to result in a high level of efficiency or productivity or quality. The offeror's qualifications meet and slightly exceed requirements. The submittal contains excellent features that will likely produce results very beneficial to the Government. Fully meets all RFP requirements and significantly exceeds many of the RFP requirements. Disadvantages are minimal. **High probability of success.**

(iii) **Satisfactory -** Information submitted demonstrates offeror's potential to meet performance or capability standards. Acceptable solution. Either meets all RFP requirements for the criterion (or sub-criterion) or contains weaknesses in some areas that are offset by strengths in other areas. A rating of "Satisfactory" indicates that, in terms of the specific criterion (or sub-criterion), the offeror has a good probability of success, as there is sufficient confidence that a fully compliant level of performance will be achieved. The proposal demonstrates an adequate understanding of the scope and depth of the RFP requirements. No significant advantages or disadvantages. **Good probability of success.**

(iv) **Marginal -** The submittal is not adequately responsive or does not address the specific criterion (or sub-criterion). The offeror's interpretation of the Government's requirements is so superficial, incomplete, vague, incompatible, incomprehensible, or incorrect as to be considered deficient. Proposal does not meet some of the minimum requirements. The assignment of a rating within the bounds of "Marginal" indicates that mandatory corrective action would be required to prevent significant deficiencies from affecting the overall project. The offeror's qualifications, plans or approach will likely result in questionable quality of performance, which represents a moderate level of risk to the Government. Low probability of success although the submittal has a reasonable chance of becoming at least acceptable. **Significant disadvantages.**

(v) Unsatisfactory - Fails to meet performance or capability standards. Unacceptable. Requirements can only be met with major changes to the submittal. There is no reasonable expectation that acceptable performance would be achieved. The proposal contains many deficiencies and/or gross omissions; fails to provide a reasonable, logical approach to fulfilling much of the Government's requirements; and/or fails to meet most or all of the minimum requirements. **Very significant disadvantages.**

For Past Performance a neutral rating will be awarded when no past performance records are provided or otherwise available. The Federal Acquisition Regulation (FAR) 15.305(a)(2)(iv) states, "In the case of an offeror without a record of relevant past performance or for whom information on past performance is not available, the offeror may not be evaluated either favorably or unfavorably on past performance."

4 RELATIVE IMPORTANCE OF EVALUATION FACTORS

4.1 RELATIVE IMPORTANCE OF PHASE 1 EVALUATION FACTORS

The evaluation factors in Phase 1 and their relative importance are listed in descending order in Table 1 in Paragraph 2.2 above. The sub-factors within each factor are listed in descending order of importance.

4.2 RELATIVE IMPORTANCE OF PHASE 2 EVALUATION FACTORS

The evaluation factors in Phase 2 and their relative importance are listed in descending order in Table 2 in Paragraph 2.3 above. The sub-factors within each factor are listed in descending order of importance.

4.3 RELATIVE IMPORTANCE OF VOLUMES

In the overall best value analysis, the evaluation factors in Volume I and Volume II are of approximately equal importance. When combined, the evaluation ratings in Volume I and II are of approximately equal importance to the price factors in Volume III.

5 SUBMITTALS & EVALUATION

The requirements specified in the solicitation are considered to be minimum requirements. A more favorable evaluation rating may be given for exceeding the minimum requirements. A low evaluation rating for any factor, or combination of different factors, may cause the proposal to be evaluated unsatisfactorily.

5.1 PHASE 1 SUBMITTALS & EVALUATION

In Phase 1, Offerors should submit one binder labeled as Volume I with tabs separating the factors shown below. All required information for each identified factor must be contained within that specified Tab.

5.1.1 TAB 1 CONTRACTUAL DOCUMENTS – SUBMITTAL REQUIREMENTS

Documents submitted under Tab 1 CONTRACTUAL DOCUMENTS will consist of the following sections:

a) COVER LETTER: The Offeror should submit a cover letter containing:

(1) Solicitation number.
(2) Name, address, e-mail, and telephone and facsimile numbers of the Offeror.
(3) Names, titles, e-mail, and telephone and facsimile numbers of persons authorized to negotiate on the Offeror's behalf with the Government in connection with this solicitation.
(4) Name, title, and signature of the person authorized to sign the proposal.
(5) A statement specifying agreement with all terms, conditions provisions included in the solicitation.
(6) Acknowledgement of all amendments to the solicitation (if applicable).

b) SECTION 00600 "REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF OFFERORS"

Offers should submit a Section 00600 completed as appropriate.

c) BONDING

(1) The Offeror should submit a signed statement from its proposed surety identifying the Offeror's maximum bonding capacity under the proposed contract. The successful Offeror will be required to submit performance and payment bonds for 100% of the task order amount immediately after award of individual task orders. For information purposes, the largest task order awarded under this contract is estimated to be approximately $20 million. See also Section 00700, PERFORMANCE AND PAYMENT BONDS and Section 00800, Paragraph 1.4.3, TASK ORDERS. Note: DO NOT SUBMIT ACTUAL PERFORMANCE AND PAYMENT BONDS WITH THIS PROPOSAL.

(2) The Offeror should explain how it will maintain sufficient bonding capacity with overlapping task orders occurring. It is anticipated that task orders will be issued on an annual basis. Depending on the Offeror's completion schedules that may range up to 15 months, task orders and bonding capacity between years may likely overlap. See also Section 00110, Paragraph 5.1.7 PROGRAM MANAGEMENT PLAN.

5.1.2 TAB 1 CONTRACTUAL DOCUMENTS – EVALUATION

Tab 1 CONTRACTUAL DOCUMENTS is not part of the SSB evaluation, but rather will used in evaluating the Offeror's responsiveness, conformance to the solicitation, and eligibility for award. Based on the information submitted, the Offeror will be either evaluated as ACCEPTABLE OR UNACCEPTABLE. Proposals that are evaluated as UNACCEPTABLE will not be evaluated further. Tab 1 CONTRACTUAL DOCUMENTS will be evaluated as follows:

a) COVER LETTER

The cover letter will be evaluated to ensure the Offeror acknowledges solicitation amendments. Otherwise, the cover letter provides information on the Offeror.

b) SECTION 00600 "REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF OFFERORS"

Section 00600 will be evaluated to determine the Offeror's business classification and responsiveness based on answers to representations, certifications, and other statements included in the solicitation.

c) BONDING

The Offeror should be capable of obtaining a minimum of $20 million in bonding capacity to be considered for award. To be considered for award, the Offeror would be required to identify how it will maintain sufficient bonding capacity assuming overlapping task orders.

5.1.3 TAB 2 EXPERIENCE (CONSTRUCTION & DESIGN) – SUBMITTAL REQUIREMENTS

Tab 2 EXPERIENCE (CONSTRUCTION & DESIGN) consists of two sub-factors: Construction Experience and Design Experience.

a) CONSTRUCTION EXPERIENCE

For Construction Experience, the Offeror should submit information on four separate areas: 1) Experience on Similar Housing Projects, 2) Design-Build construction experience, 3) Military Construction Experience and 4) Similar Climate Construction experience. The Offeror should submit up to four (4) project examples for each experience area constructed within the past five (5) years. Only those projects for which the Offeror or a primary teaming partner was the Prime Contractor should be submitted. The projects selected should clearly demonstrate the construction capabilities of the Offeror. Project examples that show more than one area of experience may be listed as a qualified project under each applicable area of experience. The Offeror should clearly identify for which experience area(s) each project example pertains (e.g., Project A may qualify and be listed for similar housing project, design-build, MILCON and similar climate while Project B may qualify and be listed only for similar housing project; etc.).

(1) Similar Housing Project Construction: Similar Housing Project examples should include residential family housing of single, duplex, tri-plex, and four-plex size. Similar housing project examples should have a dollar value greater than $10 million and have been constructed within the past five (5) years.

(2) Design-Build Construction: Project examples should show experience on Design-Build projects.

(3) Military Construction: Project examples should indicate Military Construction experience. Military Construction Experience is considered to be those projects constructed on and for military installations. An Offeror may submit project examples from Federal, State, or Local Government project(s) of similar construction experience as a substitute.

(4) Similar Climate Construction: Project examples should include Similar Climate construction experience performed in specific locations sharing similar climatic conditions to those of Ellsworth AFB, SD.

Project examples given for each area of experience should consist of a one or two page narrative discussing the project and providing specifics as noted herein. Each example should include: a description of the project and the area or experience the project demonstrates; construction contract award amount (estimated or actual); final construction cost (if applicable); location; date when the project was started; original contract finish date and actual finish date (if finished). All examples should also contain the name, address, telephone and fax number of a representative of the customer (as well as one alternate individual affiliated with your firm) familiar with the Offeror's experience on the project that can verify the experience cited.

b) DESIGN EXPERIENCE

For Design Experience, the Offeror should submit information on four separate areas: 1) Experience on Similar Housing Projects, 2) Design-Build Experience, 3) Military Construction (MILCON) Design Experience and 4) Similar Climate Design Experience. The Offeror may submit up to four (4) project examples for each experience area designed within the past five (5) years. Only those projects for which the Offeror or a primary teaming partner performed the actual design effort should be submitted. Project

examples that show more than one area of experience may be listed as a qualified project under each applicable area of experience. The Offeror should clearly identify for which experience area(s) each project example pertains (e.g., Project A may qualify and be listed for similar housing projects, design-build, MILCON, and similar climate while Project B may qualify and be listed only for similar housing projects; etc.).

(1) Similar Housing Projects: Similar Housing Projects include residential family housing of single, duplex, tri-plex, and four-plex size. Similar housing project examples should present scopes similar to this project and have been constructed within the past five (5) years.

(2) Design Build: Project examples should show experience on Design-Build Projects.

(3) Military Construction (MILCON) Design: Project examples should indicate Military Construction (MILCON) design experience. Military Construction design experience is considered to be experience on those projects constructed on and for military installations. An Offeror may submit project examples from Federal, State, or Local Government projects of similar construction design experience as a substitute.

(4) Similar Climate Design: Project examples should include Similar Climate design experience in specific locations sharing similar climatic conditions to those of Ellsworth AFB, SD.

Project examples given for each area of experience should consist of a one or two page narrative discussing the project and providing specifics as noted herein. Each example should include: a description of the project and the area or experience the project demonstrates; construction contract award amount (estimated or actual); final construction cost (if applicable); location; date when the project was started; original contract finish date and actual finish date (if finished). All examples should also contain the name, address, telephone and fax number of a representative of the customer (as well as one alternate individual affiliated with your firm) familiar with the Offeror's experience on the project that can verify the experience cited.

5.1.4 TAB 2 EXPERIENCE (CONSTRUCTION & DESIGN) – EVALUATION

Tab 2 EXPERIENCE (CONSTRUCTION & DESIGN) contains two sub-factors that are listed in descending order of importance: Construction Experience and Design Experience. Experience of primary teaming partners will be recognized and evaluated in the same manner as Experience of the Offeror. Tab 2 EXPERIENCE (CONSTRUCTION & DESIGN) will be evaluated as follows:

a) CONSTRUCTION EXPERIENCE

For Construction Experience, the Offeror will be evaluated on four separate areas, listed in descending order of importance: 1) Experience on Similar Housing Projects, 2) Design-Build Construction Experience, 3) Military Construction (MILCON) Experience and 4) Similar Climate Construction Experience.

(1) Similar Housing Project Construction: A proposal offering Similar Housing Project experience through project examples under the prescribed parameters of the solicitation may be evaluated more favorably than those that demonstrate the experience on other type project(s). Offerors may be

evaluated more favorably based on: (i) a larger number of similar projects (not to exceed four); (ii) more recent projects; or (iii) projects with a dollar value over $10 million.

(2) Design-Build Construction: A proposal offering Design-Build experience under the parameters of this solicitation may be evaluated more favorably than those that demonstrate the experience on other type project(s). Offerors may be evaluated more favorably based on: (i) a larger number of similar projects (not to exceed four); (ii) more recent projects; or (iii) work done in conjunction with members of the proposed design-build team.

(3) Military Construction: A proposal offering MILCON experience under the parameters of this solicitation may be evaluated more favorably than those that demonstrate the experience on other type project(s). Offerors may be evaluated more favorably based on: (i) a larger number of similar projects (not to exceed four); (ii) more recent projects; or (iii) MILCON experience rather than Federal, State, or Local Government experience.

(4) Similar Climate Construction: A proposal offering Similar Climate construction experience under the parameters of this solicitation may be evaluated more favorably than those that demonstrate the experience on other type project(s). Offerors may be evaluated more favorably based on: (i) a larger number of similar projects (not to exceed four); (ii) more recent projects; or (iii) projects completed in harsher climate conditions.

b) DESIGN EXPERIENCE

For Design Experience, the Offeror will be evaluated on four separate areas, listed in descending order of importance: 1) Experience on Similar Housing Projects, 2) Design-Build Experience, 3) Military Construction (MILCON) Design Experience and 4) Similar Climate Design Experience.

(1) Similar Housing Projects: A proposal offering Similar Housing Project experience through project examples under the prescribed parameters of this solicitation may be evaluated more favorably than those that demonstrate the experience on other type project(s). Offerors may be evaluated more favorably based on: (i) a larger number of <u>similar</u> projects (not to exceed four); (ii) more recent projects.

(2) Design-Build: A proposal offering Design-Build experience through project examples under the prescribed parameters of this solicitation may be evaluated more favorably than those that demonstrate the experience on other type project(s). Offerors may be evaluated more favorably based on: (i) a larger number of similar projects (not to exceed four); (ii) more recent projects; or (iii) work done in conjunction with members of the proposed design team.

(3) Military Construction (MILCON) Design: A proposal offering MILCON design experience under the parameters of this solicitation may be evaluated more favorably than those that demonstrate the experience on other type project(s). Offerors may be evaluated more favorably based on: (i) a larger number of similar projects (not to exceed four); (ii) more recent projects; or (iii) MILCON experience rather than Federal, State, or Local Government experience.

(4) Similar Climate Design: A proposal offering Similar Climate experience under the parameters of this solicitation may be evaluated more favorably than those that demonstrate the experience on other type project(s). Offerors may be evaluated more favorably based on: (i) a larger

number of similar projects (not to exceed four); (ii) more recent projects; or (iii) projects completed in harsher climate conditions.

5.1.5 TAB 3 PAST PERFORMANCE (CONSTRUCTION & DESIGN) SUBMITTAL REQUIREMENTS

Tab 3 PAST PERFORMANCE (CONSTRUCTION & DESIGN) consists of two sub-factors: Construction Past Performance and Design Past Performance.

a) CONSTRUCTION PAST PERFORMANCE

The offeror should submit past performance information ratings for the past five (5) years on projects identified in Tab 2A CONSTRUCTION EXPERIENCE. They should also submit all Construction Contractor Appraisal Support System (CCASS) Performance Evaluations received on DOD Government projects within the last 5 years. 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. For each project constructed for Private Industry, provide a completed Performance Summary Sheet for each applicable project within the last 5 years. A blank copy of the Performance Summary Sheet (Construction) is attached to this section. This form must be completed by an owner or owner's representative not affiliated with the offeror and included in the proposal. The Government reserves the right to contact the evaluator on previous Government or Private Sector work to verify the Offeror's construction performance.

b) DESIGN PAST PERFORMANCE

The offeror should submit past performance information ratings for the past five (5) years on projects identified in Tab 2B DESIGN EXPERIENCE. They should also submit all Architect-Engineer Contract Administration Support System (ACASS) Performance Evaluations received on DOD Government design projects within the last 5 years. Copies of records contained in the Corps of Engineers ACASS Database may be requested by fax on company letterhead at the following telefax number: (503) 808-4596. For each project designed for Private Industry, provide a completed Performance Summary Sheet for each applicable project within the last 5 years. A blank copy of the Performance Summary Sheet (Design) is attached to this section. This form must be completed by an owner or owner's representative not affiliated with the offeror and included in the proposal. The Government reserves the right to contact the evaluator on previous Government or Private Sector work to verify the Offeror's design performance.

5.1.6 TAB 3 PAST PERFORMANCE (CONSTRUCTION & DESIGN) – EVALUATION

Tab 3 PAST PERFORMANCE (CONSTRUCTION & DESIGN) contains two sub-factors that are listed in descending order of importance: Construction Past Performance and Design Past Performance. Past Performance of primary teaming partners will be recognized and evaluated in the same manner as Past Performance of the Offeror. Tab 3 PAST PERFORMANCE (CONSTRUCTION & DESIGN) will be evaluated as follows:

a) CONSTRUCTION PAST PERFORMANCE

Past Performance ratings received on prior DOD Government work and projects completed for Private Industry will be evaluated. Higher evaluation ratings may be awarded for Exceptional evaluations. In descending order, lower ratings may be given to evaluations of Above Average, Average, Marginal, and Unacceptable. If an Offeror has no past performance evaluations within the CCASS database or Performance Summary sheets included in the proposal, a neutral rating will be awarded. The Government reserves the right to contact the evaluators of either the CCASS Rating or the Performance Summary Sheets submitted. The Government also reserves the right, but is not obligated, to query any Government agencies, databases, and publications for information such as performance evaluations, debarment, terminations, and litigation for evaluation purposes. For Past Performance a neutral rating will be awarded when no past performance records are provided or otherwise unavailable. The Federal Acquisition Regulation (FAR) 15.305(a)(2)(iv) states, “In the case of an offeror without a record of relevant past performance or for whom information on past performance is not available, the offeror may not be evaluated either favorably or unfavorably on past performance."

b) DESIGN PAST PERFORMANCE

Past Performance ratings received on prior DOD Government work and projects completed for Private Industry will be evaluated. Higher evaluation ratings may be awarded for Exceptional evaluations. In descending order, lower ratings may be given to evaluations of Above Average, Average, Marginal, and Unacceptable. If an Offeror has no past performance evaluations within the ACASS database or Performance Summary sheets included in the proposal, a neutral rating will be awarded. The Government reserves the right to contact the evaluators of either the ACASS Rating or the Performance Summary Sheets submitted. The Government also reserves the right, but is not obligated, to query any Government agencies, databases, and publications for information such as performance evaluations, debarment, terminations, and litigation for evaluation purposes. For Past Performance a neutral rating will be awarded when no past performance records are provided or otherwise unavailable. The Federal Acquisition Regulation (FAR) 15.305(a)(2)(iv) states, “In the case of an offeror without a record of relevant past performance or for whom information on past performance is not available, the offeror may not be evaluated either favorably or unfavorably on past performance."

c) NO RELEVANT PAST PERFORMANCE INFORMATION

An offeror will be awarded a neutral rating when no relevant past performance information is provided or otherwise unavailable. The Federal Acquisition Regulation (FAR) 15.305(a)(2)(iv) states, “In the case of an offeror without a record of relevant past performance or for whom information on past performance is not available, the offeror may not be evaluated either favorably or unfavorably on past performance." However, an Offeror may submit and be evaluated on past performance information regarding predecessor companies, key personnel who have relevant experience, or subcontractors that will perform major or critical aspects of the requirement when such information is relevant to the instant acquisition.

d) ADVERSE PAST PERFORMANCE INFORMATION

In accordance with FAR 15.306, the Government may initiate exchanges with an Offeror to clarify adverse past performance information when the Offeror has not previously had an opportunity to comment. Since discussions are not intended to occur in Phase 1, the Government may accomplish exchanges through clarifications prior to selecting the most highly qualified firms to submit proposals in Phase 2.

5.1.7 TAB 4 PROGRAM MANAGEMENT PLAN – SUBMITTAL REQUIREMENTS

The Offeror should provide a comprehensive Program Management Plan detailing the overall management approach to this entire Housing Program (FY 03 – FY 10). The Program Management Plan should clearly indicate how the Offeror has the ability to deliver quality housing units under the following constraints:

- 450 Calendar Day Design and Construction Schedule.
- Task Orders issued annually.
- Approximately 100 housing units to be constructed per year.
- Working with the Base Housing Office to vacate existing units and turnover of finished units in a systematic method.
- Limitations of available local labor forces.
- Quality control procedures.
- Phased prototype (Model) construction
- Phased turnover of finished (accepted) housing units.

5.1.8 TAB 4 PROGRAM MANAGEMENT PLAN – EVALUATION

The Program Management Plan will be evaluated for inclusion of all tasks identified in the Program Management Plan submittal paragraph above. The requirements specified in the solicitation are considered to be minimum requirements. A more favorable evaluation rating may be given for exceeding the minimum requirements. The quality of the Offeror's plan to deliver a quality product under the constraints listed will be evaluated. Higher evaluation ratings can be achieved with a thoroughly explained Program Management Plan that illustrated that the Offeror has a firm understanding of the scope and complexity of this housing program.

5.1.9 TAB 5 PERSONNEL – SUBMITTAL REQUIREMENTS

Tab 5 PERSONNEL consists of three sub-factors: Construction Personnel, Design Personnel, and Other Professional Personnel. Résumés should be submitted in the following format.

Name/Title	
Proposed Duties & Functions	
Firm Affiliation/Years Affiliated	
Years of Experience (performing proposed duties & functions)	
Education: Degree Year Specialization	
Active Registrations and/or Professional/Technical Certifications/Licenses	
Specific Qualifications	
List of Relevant Projects Including: Title Description Type (D-B, Construction, etc.) Dollar Value Year Complete Duties/Functions	

a) CONSTRUCTION PERSONNEL

The Offeror should submit the names and résumés for key construction personnel that will be assigned to this project. In addition, the Offeror should provide a summary of the duties and responsibilities of these individuals, which clearly indicates separate duties and responsibilities for each of the individuals. As a minimum, this sub-factor should include data on the following personnel:

(1) Project Superintendent: The Project Superintendent should be a graduate engineer or experienced construction person and have at least 5 years experience in related work on housing projects similar to this project.

(2) Project Manager: The Project Manager should be a degreed or registered engineer, architect or graduate construction or engineering manager and have at least 5 years experience in related work on housing projects similar to this project.

(3) CQC System Manager: The Contractor Quality Control (CQC) Manager should be a graduate engineer or an experienced construction person with a minimum of 5 years experience as a CQC in related work on housing projects similar to this project.

The proposal should clearly present the credentials of each person, and show that each meets the requirements listed above. Resumes should include examples of project experience and educational qualifications.

b) DESIGN PERSONNEL

The Offeror should submit the résumés on lead and support design personnel who will work on this project. Key personnel should have their respective professional registrations and experience in design of similar housing projects. Resumes should list projects, identified in the sub-factor DESIGN EXPERIENCE (Tab 2) above, that show previous design team working relationships among key personnel. The Design Team should include a Project Manager (registered Architect or Engineer); a registered Architect proficient with LEED Green Building Rating Systems and its building practices, technologies, policies and standards developed by the U.S. Green Building Council; a registered Structural Engineer; a registered Mechanical Engineer; a registered Fire Protection Engineer (FPE); a certified Interior Designer; a registered Electrical Engineer; a registered Civil Engineer; a registered Landscape Architect and a licensed Corrosion Engineer (NACE). If, because of reasons beyond the control of the design team, the named individuals cited in the original proposal are not able to fulfill this obligation, replacement personnel with similar education and experience shall be presented to the Contracting Officer for acceptance.

c) OTHER PROFESSIONAL PERSONNEL

The Offeror should submit the names and résumés for key professional personnel that are to be utilized under this contract and in place for the first Task Order. See also Section 00800, Paragraph 1.4.4 TASK ORDERS FOR PROFESSIONAL SERVICES. As a minimum, this sub-factor should include data on the following personnel:

(1) Surveyor: The Surveyor should be state board licensed in the State of South Dakota and have at least 5 years experience in the field of surveying. Surveyor should have all software required to meet project needs.

(2) Community Planner: The Community Planner should have at least 5 years experience in site planning, and development of land use plans for subdivisions or planned communities.

(3) GIS/Mapping Coordinator: The GIS/Mapping Coordinator should have 5 years experience as a Coordinator and at least 3 years experience in software usage and database management.

(4) CADD Technician: The CADD Technician should have an Associates Degree in the Applied Science of CADD Drafting and have at least 5 years of CADD drafting experience.

(5) Geologist/Geotechnical Engineer: The Geologist/Geotechnical Engineer should be a licensed geologist or registered professional engineer and have at least 5 years experience in soil borings and soil classification.

The Contractor should have the capability to provide geotechnical support, including but not limited to the performance of both in-situ drilling/back hoe operations for geotechnical and chemical laboratory soil testing and analyses to determine chemical and physical soil characteristics. The Contractor or subcontractor should be able to interpret the results of such testing and analyses; utilize the results as a basis for ensuring the remedial system is designed, constructed, operated and maintained properly; and determine the effectiveness of the remedial system in accordance with the original design. The geological requirements related to the remedial action will be described in each individual Task Order.

(6) Asbestos/Lead Paint Sampling Technician: The Asbestos/Lead Paint Sampling Technician should be an OSHA Certified competent person with at least 2 years experience of on-the-job asbestos/lead paint sampling experience.

(7) Certified Industrial Hygienist (CIH): The CIH should be certified by the American Board of Industrial Hygiene with a minimum of a 4-year college degree in a related field from an accredited postsecondary institution and a minimum of five years working experience in:

Air monitoring techniques and in development of respiratory protection.

Personal protective equipment programs for working in potentially toxic atmospheres and confined spaces.

Working knowledge of applicable federal, state, and local occupational safety and health regulations.

5.1.10 TAB 5 PERSONNEL– EVALUATION

Tab 5 PERSONNEL contains three sub-factors that are listed in descending order of importance: Construction Personnel, Design Personnel, and Other Professional Personnel. Personnel of primary teaming partners will be recognized and evaluated in the same manner as Personnel of the Offeror. Tab 5 PERSONNEL will be evaluated as follows:

a) CONSTRUCTION PERSONNEL

Experience on similar housing projects, education, responsibilities/duties, and years of experience will be evaluated for the key construction personnel identified. Offerors with key construction personnel with prior experience on military housing construction projects and/or completion of design-build housing projects may receive a more favorable evaluation.

b) DESIGN PERSONNEL

Experience on similar housing projects, education, professional certification/registration, responsibilities/duties, and years of experience will be evaluated for the key design personnel identified. Offerors with key design personnel with prior experience on military housing design projects and/or completion of design-build housing projects may receive a more favorable evaluation.

c) OTHER PROFESSIONAL PERSONNEL

Experience, education, professional certification/registration, responsibilities/duties, and years of experience will be evaluated for the key professional personnel identified. Offerors with key professional personnel with prior experience on military projects and/or housing projects may receive a more favorable evaluation.

5.1.11 TAB 6 PAST PERFORMANCE (UTILIZATION OF SMALL BUSINESS CONCERNS) – SUBMITTAL REQUIREMENTS

a) SMALL BUSINESS

Only large business concerns are required to submit information for Tab 6 PAST PERFORMANCE (UTILIZATION OF SMALL BUSINESS CONCERNS). Small business concerns should state their business size classification based on the NAICS code and size standard in Section 00100 of the solicitation on a separate sheet of bond paper.

b) LARGE BUSINESS

Only large business concerns are required to submit information for Tab 6 PAST PERFORMANCE (UTILIZATION OF SMALL BUSINESS CONCERNS). Tab 6 PAST PERFORMANCE (UTILIZATION OF SMALL BUSINESS CONCERNS) will be evaluated to determine the Offeror's past performance in meeting small business goals for the following small business classifications: Small Business (SB), Small Disadvantaged Business (SDB), Women Owned Small Business (WOSB), HUBZone, and Severely Disabled Veteran Owned Small Business (SDVOSB). The Offeror should submit data on its overall past performance in meeting small business goals on all Government contracts of a similar nature within the last 5 years containing FAR Clause 52.219-8, "Utilization of Small, Small Disadvantaged and Women-Owned Small Business Concerns" and FAR Clause 52.219-9, "Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan." The data to be provided should account for each of the above small business classifications and include:

(1) Client/Customer.
(2) Contract/Identification Number.
(3) Project Description.
(4) Contract Amount.
(5) Reference or Point of Contract (to include address and telephone number).
(6) Official Documentation (Government contracts only) that may include:
(i.) Evidence of compliance checks by Government agencies such as Small Business Administration, Defense Contract Audit Agency, or U.S. Army Corps of Engineers.
(ii.) Standard Form 294 and Standard Form 295.
(7) Other Relevant Documentation that may include citations, awards, letters of accommodation, etc. that demonstrate successful past performance in utilization of small business concerns.

5.1.12 TAB 6 PAST PERFORMANCE (UTILIZATION OF SMALL BUSINESS CONCERNS) – EVALUATION

a) SMALL BUSINESS

In accordance with FAR 15.305, small business concerns will receive the highest evaluating rating under Tab 6 PAST PERFORMANCE (UTILIZATION OF SMALL BUSINESS CONCERNS).

b) LARGE BUSINESS

Offerors (only if a large business) will be formally evaluated under Tab 6 PAST PERFORMANCE (UTILIZATION OF SMALL BUSINESS CONCERNS) to determine the Offeror's past performance in establishing and achieving realistic yet challenging goals on recent Government contracts of a similar nature. Offeror's who have recently established and achieved higher goals will be evaluated more favorably. For Past Performance a neutral rating will be awarded when no past performance records are provided or otherwise unavailable. The Federal Acquisition Regulation (FAR) 15.305(a)(2)(iv) states, "In the case of an offeror without a record of relevant past performance or for whom information on past performance is not available, the offeror may not be evaluated either favorably or unfavorably on past performance."

c) NO RELEVANT PAST PERFORMANCE INFORMATION

A neutral rating will be awarded an offeror (only if a large business) when no relevant past performance information is provided or otherwise unavailable. The Federal Acquisition Regulation (FAR) 15.305(a)(2)(iv) states, "In the case of an offeror without a record of relevant past performance or for whom information on past performance is not available, the offeror may not be evaluated either favorably or unfavorably on past performance." However, an Offeror may submit and be evaluated on past performance information regarding predecessor companies or subcontractors that will perform major or critical aspects of the requirement when such information is relevant to the instant acquisition.

d) ADVERSE PAST PERFORMANCE INFORMATION

In accordance with FAR 15.306, the Government may initiate exchanges with an Offeror to clarify adverse past performance information when the Offeror has not previously had an opportunity to comment. Since discussions will not occur in Phase 1, the Government may accomplish these exchanges through clarifications prior to selecting the most highly qualified firms to submit proposals in Phase 2.

5.2 PHASE 2 SUBMITTALS & EVALUATION

In Phase 2, Offerors will be required to submit two binders labeled as Volume II and Volume III with tabs separating the factors shown below. All required information for each identified factor must be contained within that specified Tab.

5.2.1 TAB 7 HOUSING UNIT CONCEPT DESIGN - SUBMITTAL REQUIREMENTS

Tab 7 HOUSING UNIT CONCEPT DESIGN consists of two sub-factors: Housing Unit Design and Supporting Data Housing Unit Design.

a) HOUSING UNIT DESIGN

(1) Architectural Design Narrative. Provide a description of how the desired architectural character is achieved through the use of form, scale and proportion, and how materials are

used to add pattern and definition to the design. Discuss the sensory perception and recognition of the physical elements as they are experienced sequentially in time as one approaches, enters, and moves through the order of spaces within the housing unit. Briefly discuss the functioning of activities within the housing unit spaces and the qualities of light, view and acoustics.

(2) Architectural Design Drawings.

(i.) Architectural Floor Plans – Provide overall dimensions, room dimensions and areas, equipment and fixtures, include door swings and typical furniture arrangements, identify types of materials and show all columns, partitions, openings, and roof overhangs.

(ii.) Exterior Elevations - Provide drawings to present design intent, identify exterior materials and show proposed detailing. Indicate door and window sizes and configurations, porches, decks and exterior steps. Provide major horizontal and vertical dimensions.

(iii.) Building Section – Provide a building section of the proposer's choice that will illustrate the vertical relationship of all major building components, walls, floors, ceiling and roofs. Identify materials and show foundations, porches and decks as applicable. Explain how this section is either typical of all proposed family housing units or how other models may be different from the section shown.

(iv.) Wall Section - Provide a typical wall section showing foundation, wall composition, and floor and roof system. Identify materials, finishes, thermal insulation and vapor protection.

(v.) Finish and Equipment Schedules - Provide interior finish schedule, door and window schedules. Include ceiling heights on the interior finish schedule.

(i.) Provide layout of equipment as proposed for the mechanical room.

(ii.) Use Net Floor Area Calculation Worksheet, and Kitchen Cabinet Size Calculation Worksheet, attached to this Section, in your proposal to support compliance with RFP criteria.

(3) **Color Boards**. Color boards are to depict exterior and interior materials, finishes, and colors. Color board submittal is to be bound in a standard, letter-size binder. One original bound Color Board shall be submitted with the Phase 2 Proposal (Volume II) submittal. Colored photographs (8"x 10") of the original color board shall be submitted within the 6 copies of the Volume II proposals.

b) SUPPORTING DATA HOUSING UNIT DESIGN

Product Literature. The Offeror should fill out and submit the attached form titled: Construction Materials, Products, Equipment, and Systems to indicate specific make and model of the proposed materials, products, equipment, and systems. In addition, the Offeror should provide product literature for all items listed in this attached form including manufacturer's descriptive literature, technical data, performance charts and curves, catalog cuts, etc. The technical data proposed should meet the specific requirements contained in this solicitation.

(1) Betterments. The Offeror should identify on this form all proposed Betterments (materials, products, equipment, systems, etc) that exceed the basic requirements of the solicitation and remain within the Design/Construction Cost Limitation. This includes consideration of the items listed in the attached form and any other items furnished as part of the construction and delivery of the housing units. Any betterment included in the Offeror's proposal that is applicable to housing units shall be applicable for all the housing units. See Section 01000, PART 1 – GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS for list and priority of betterments.

(2) Deviations. The Offeror should provide a list of all other deviations, deemed necessary by the Offeror, to achieve cost limitations, meet statutory requirements, and/or are mandatory due to technical flaws in the solicitation (i.e. performance, structural integrity, safety, maintainability, applicable code requirements, etc) in order to deliver the intended basic requirements of the solicitation. Each deviation shall include an explanation of why the Offeror believes the deviation is necessary.

(3) Recovered Materials. Include information on the use of EPA designated items composed of recovered (recycled) materials. Indicate specific material and equipment being proposed by highlighting model numbers and specific types and grades of materials on the manufacturer's catalog cut / literature. Recovered Materials should be used to the maximum extent practicable. Practicable being defined (per 40 CFR CH.1, 247.3) as capable of being used consistent with (a) performance in accordance with applicable specifications, and (b) availability at a reasonable price, availability within a reasonable period of time within the proposed schedule, and maintenance of a satisfactory level of competition. Provide a list of materials proposed on this project.

5.2.2 TAB 7 HOUSING UNIT CONCEPT DESIGN – EVALUATION

Tab 7 HOUSING UNIT CONCEPT DESIGN contains two sub-factors that are listed in descending order of importance: Housing Unit Design and Supporting Data Housing Unit Design. Tab 7 HOUSING UNIT CONCEPT DESIGN will be evaluated as follows:

a) HOUSING UNIT DESIGN

(1) Exterior Architectural Design. This part of the evaluation assesses the degree to which the proposed buildings provide the appearance of the desired "Prairie Style" of architecture. Consideration will be given to the use of form, scale and proportion, and materials to order relationships among the building's elements to achieve the desired character and individuality. Also, consideration will be given to how the detailing of materials complements the design and adds to the visual interest and appeal of the building.

(2) Interior Architectural Design. This part of the evaluation assesses the elements of planning and designing the family housing unit interiors. Consideration will be given to the livability, flexibility, functionality and individuality of the floor plans. Also, consideration will be given to the overall sensory perception of the physical elements of the design including qualities of light, view and acoustics.

(3) Net Floor Area and Kitchen Cabinet Size. This part of the evaluation assesses the firm's preparation of the Calculation Worksheets (Net Floor Area and Kitchen Cabinet Size) for compliance with solicitation requirements.

b) SUPPORTING DATA HOUSING UNIT DESIGN

(1) Housing Unit Exterior Materials. This part of the evaluation assesses the housing unit exterior construction materials and finishes.

(2) Housing Unit Interior Materials. This part of the evaluation assesses the housing unit interior construction materials and finishes.

(3) Housing Unit Mechanical Systems. This part of the evaluation assesses the housing unit mechanical systems including heating and air-conditioning, plumbing and ventilation.

(4) Housing Unit Electrical Systems. This part of the evaluation assesses the housing unit electrical systems including power, lighting and communications.

(5) Appliances. This part of the evaluation assesses the quality of all major appliances.

(6) Percentage of Recovered Material. Consideration will be given to the extent, which the designated items are proposed for this project. The more materials offered, the higher the rating assigned.

(7) Betterments. The Offeror will be evaluated on the priority and number of Betterments proposed. Higher evaluations will be assigned based on the number and priority of Betterments proposed. (See above paragraph 5.2.1, b) (2) on conditions and use of Betterments.)

(8) Deviations. The Government believes the solicitation requirements are technically sound, comply with statutory requirements, and are awardable within the specified cost limitation. Deviations that, in the Government's evaluation, negatively conflict with the solicitation requirements may be evaluated unfavorably or even result in rejection of the proposal as non-responsive.

5.2.3 TAB 8 SITE CONCEPT DESIGN - SUBMITTAL REQUIREMENTS

TAB 8, SITE CONCEPT DESIGN consists of three sub-factors: Site Concept Design, Demolition Plan, and Supporting Data Site Design.

a) SITE CONCEPT DESIGN

(1) Site Analysis Narrative. Provide a description of the basic site layout and the rationale behind the site design. Address how the proposal accomplishes the Air Force neighborhood "Goal" through the five site development Objectives presented on page 25 of the Air Force Family Housing Guide, Chapter 3 - Neighborhood Design, paragraph Goals and Objectives (see Attachment I). This should be a comprehensive look at the new housing neighborhood including the follow-on phase of development. Also address environmental conditions, prevailing winds, solar effect, housing setbacks, and the relationship of the site to the surrounding environment.

(2) Site Concept Presentation Plans. Practical and architecturally sound site layout drawn to scale based on the topographical information provided by the Government.

(3) 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, stockpile area, and the overall project site.

(4) Site Plan: The Site Plan shall show all the site layout information necessary to field locate the houses, driveways, outdoor living spaces, sidewalks, privacy fence, security fence, recreation areas, common areas, and all other appurtenances to be constructed as part of the project. Site plan needs to provide setback information.

(5) Landscape Plan: Landscape Plan shall show trees, shrubs, ground cover, and seeded or sodded areas. The Landscape Plan shall be prepared by a fully qualified, experienced professional Landscape Architect.

(6) Pavement Plan: The pavement plan shall show the location of any pavement work required.

(7) Grading and Drainage Plan: A preliminary grading and drainage plan shall be provided at the same scale as the site plan. Existing grading contours shall be indicated at 1 ft contour intervals. Indicate the proposed finished floor elevation of new houses and structures. New contours do not need to be provided for this submittal. Plans shall show the layout of the proposed and existing storm drainage. Provide location and description of benchmarks and indicate vertical and horizontal datum's.

(8) Sanitary Sewer and Water Plans: Sanitary sewer and water plans shall show locations of new and existing mains and service lines. Scale to match site plans.

(9) Natural Gas Plans: Scale to match site plans for natural gas plans. Natural gas distribution system plans shall locations of new and existing mains and service lines.

(10) Electrical Distribution Plans: Electrical distribution plan shall show site lighting (street and walkway), primary cable routing (new and existing) pad-mounted transformers & switches, and secondary service laterals. Scale to match site plans.

b) DEMOLITION PLAN

The Offeror should submit a comprehensive Demolition Plan that provides detailed information on the extent of demolition required and the procedures used to accomplish all demolition on the project site for Task Order No. 1.

(1) Demolition Narrative. The demolition narrative should include information such as the description of the demolition procedures proposed, permits required, hazardous material (Asbestos & Lead Based Paint) removal methods and procedures, safety precautions taken, and the equipment proposed to be used for demolition.

(2) Demolition Plan. The removal plan should show the existing physical features and condition of the site before construction. Each physical feature and utility to be removed shall be hatched as indicated on the standard legend sheet, a legend on the removal plan, and properly noted: to be removed, to remain, or to be relocated. Scale to match site plans.

c) SUPPORTING DATA SITE DESIGN

(1) Product Literature. The Offeror should fill out and submit the attached form titled: Construction Materials, Products, Equipment, and Systems to indicate specific make and model of the proposed materials, products, equipment, and systems. In addition, the Offeror should provide product literature for all items listed in this attached form including manufacturer's descriptive literature, technical data, performance charts and curves, catalog cuts, etc. The technical data proposed should meet the specific requirements contained in this solicitation.

(2) Betterments. The Offeror should identify on this form all proposed Betterments (materials, products, equipment, systems, etc) that exceed the basic requirements of the solicitation. This includes consideration of the items listed in the attached form and any other items furnished as part of the construction and delivery of the housing units. Any betterment included in the Offeror's proposal that is applicable to housing units shall be applicable for all the housing units. See Section 01000, PART 1 – GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS for list and priority of betterments.

(3) Deviations. The Offeror should provide a list of all other deviations, deemed necessary by the Offeror, to achieve cost limitations, meet statutory requirements, and/or are mandatory due to technical flaws in the solicitation (i.e. performance, structural integrity, safety, maintainability, applicable code requirements, etc) in order to deliver the intended basic requirements of the solicitation. Each deviation shall include an explanation of why the Offeror believes the deviation is necessary.

(4) Recovered Materials. Include information on the use of EPA designated items composed of recovered (recycled) materials. Indicate specific material and equipment being proposed by highlighting model numbers and specific types and grades of materials on the manufacturer's catalog cut / literature. Recovered Materials should be used to the maximum extent practicable. Practicable being defined (per 40 CFR CH.1, 247.3) as capable of being used consistent with (a) performance in accordance with applicable specifications, and (b) availability at a reasonable price, availability within a reasonable period of time, and maintenance of a satisfactory level of competition. Provide a list of materials proposed on this project.

5.2.4 TAB 8 SITE CONCEPT DESIGN - EVALUATION

Tab 8 SITE CONCEPT DESIGN contains three sub-factors that are listed in descending order of importance: Site Design, Demolition Plan, and Supporting Data Site Design. Tab 8 SITE CONCEPT DESIGN will be evaluated as follows:

a) SITE CONCEPT DESIGN

(1) Neighborhood Identity. This part of the evaluation deals with how successfully the proposed family housing site design uses the principal of spatial "hierarchy" to create a sense of neighborhood identification for residents. The evaluation will look at the use of open space, street layout and pedestrian circulation in relationship to individual homes, sub-neighborhoods and the neighborhood community. Consideration will be given to the following elements:

(i.) Street layout: Vehicle circulation, turning movements at intersections, lighting, visual buffering, and integration of future housing development.

(ii.) Housing setbacks and variation of housing units.

(iii.) Pedestrian circulation and accessibility to playgrounds and recreation areas.

(iv.) Emergency and service vehicle access: Provision for immediate and direct access, and adequate night lighting, for emergency vehicles and access for service vehicles. This includes servicing the utilities located in the utility corridor as well as mail delivery and trash pickup.

(v.) Grading: Site development provisions for drainage solutions that retain storm water on site, provide adequate protection for living units and yards, and preventing ponding in common areas.

(2) Landscaping. Consideration will be given to the following elements:

(i.) Creation of open spaces for recreation, privacy, set-backs, as well as the use of landscape to define these amenities, and buffers from noisy elements and the integration of these elements into the overall site plan which includes the follow-on phase of development.

(ii.) All considerations of landscape design, location, size and quantity, appropriateness of planting selection, and proposed windbreak design.

(3) Utilities. This area of evaluation includes overall planning, layout, design and development of the site utility systems including the utility corridor. It embraces consideration of flexibility, maintenance, and accessibility. It includes evaluation of the design for the following systems: water distribution system; electrical system including site and street lighting, telephone and cable television; gas distribution system; and sanitary sewage system.

b) DEMOLITION PLAN

The Demolition Plan will be evaluated for inclusion of all tasks identified in the Demolition Plan submittal paragraph above. Higher evaluation ratings can be achieved with a thoroughly explained Demolition Plan suitable for the scope and complexity of this housing project.

c) SUPPORTING DATA SITE DESIGN

Consideration will be given to the quality, durability and degree and frequency of maintenance required for the equipment and materials proposed for the project based on the following elements:

(1) Site Equipment and Materials. This part of the evaluation assesses the quality of materials proposed for the project site development including civil, mechanical, electrical and landscaping.

(2) Percentage of Recovered Material. Consideration will be given to the extent, which the designated items are proposed for this project. The more materials offered, the higher the rating assigned.

(2) Betterments. The Offeror will be evaluated on the priority and number of Betterments proposed. Higher evaluations will be assigned based on the number and priority of Betterments proposed. (See above paragraph 5.2.3, c) (2), on conditions and use of Betterments.)

(3) Deviations. The Government believes the solicitation requirements are technically sound, comply with statutory requirements, and are awardable within the specified cost limitation. Deviations that, in the Government's evaluation, negatively conflict with the solicitation requirements may be evaluated unfavorably or even result in rejection of the proposal as non-responsive.

5.2.5 TAB 9 PROJECT MANAGEMENT – SUBMITTAL REQUIREMENTS

Tab 9 PROJECT MANAGEMENT consists three sub-factors: Project Management Plan, Project Schedule, and Safety & Health Record.

a) PROJECT MANAGEMENT PLAN (PMP)

The Offeror should provide a comprehensive Project Management Plan (PMP) developed specifically for the first task order of this contract. The PMP should discuss the specific needs of the first task order including the management approach used to design, demo, construct, and turnover of all housing units of the first task order within the proposed schedule. The PMP should contain a detailed discussion on phased turnover of the finished housing units and how it will be achieved within the proposed schedule. The information in the PMP should make it clear that the Offeror has the ability to deliver a quality product and effectively manage the designers, consultants and subcontractors on the team, as well as the ability to coordinate all work throughout the design and construction phases. The PMP shall include an explanation of the total project team management approach for both the design team and the construction team. It shall include: management of firms included within the design team and construction team, specific quality control procedures used (including Quality Control procedures to be used to limit re-submittals, design errors, and poor coordination between the prime design firm and design consultant), schedule development, and methods to be utilized to adhere to the schedule. In addition, it should address the acquisition of environmental permits in a timely fashion, safety, preparation and submission of As-Built documents, and contract closeout. It should discuss how the design team will support the Offeror during construction and an organizational chart showing the inter-relationship of management and various team components, including the Corps of Engineers and the Air Force. In addition, the PMP should address the relationship between designer and construction contractor and should clearly indicate an understanding of the design-build process.

b) PROJECT SCHEDULE

The Offeror should provide a project schedule for design, demolition, and construction work for the first task order. The schedule should be prepared in the form of time-scaled (Gantt Chart) summary network diagram and graphically indicate sequences proposed to accomplish each general work operation including design, design reviews, demolition, construction, phased turn-over of accepted units, final clean-up of premises, and interactions and dependencies among the various activities (do not include a Network Analysis System (NAS) at this time. A Network Analysis System will become a requirement after award. See Section 01320A PROJECT SCHEDULE). The schedule should illustrate when finished units will be turned over in a phased manner. The proposed project schedule should clearly indicate the total number of calendar days from Notice to Proceed proposed for task order performance. The proposed

completion time will become a contract requirement. If the Offeror fails to complete the work within the time specified, the Offeror may be subject to liquidated damages (if applicable).

The Offeror should provide a verification statement that the Contractor has read the contract requirements and that the number of days includes all design time, Government review time of all design submittals, demolition time, and construction time necessary to complete the project. The schedule duration shall reflect the design and design review requirements addressed in the Section 01332 SUBMITTALS DURING DESIGN. Allow 20 calendar days review by Government (includes review conference) for each design submittal.

c) HEALTH AND SAFETY RECORD

The Offeror should submit OSHA Form 200 showing the incident rates (averaged over the past five years).

5.2.6 TAB 9 PROJECT MANAGEMENT – EVALUATION

Tab 9 PROJECT MANAGEMENT consists of three sub-factors that are listed in descending order of importance: Project Management Plan, Project Schedule, and Safety & Health Record. The requirements specified in the solicitation are considered to be minimum requirements. A more favorable evaluation rating may be given for exceeding the minimum requirements. Tab 9 PROJECT MANAGEMENT will be evaluated as follows:

a) PROJECT MANAGEMENT PLAN (PMP)

Project Management Plans will be evaluated for inclusion of all tasks identified in the Project Management Plan submittal paragraph above. The quality of the Offeror's plan to deliver a quality product and effectively manage the construction team and ability to effectively coordinate all work throughout the design and construction phase of this project will be evaluated. Higher evaluation ratings can be achieved with a thoroughly explained Project Management Plan suitable for the scope and complexity of this housing project, and which addresses each of the following:

- Management Approach
- Sub-Contractor Management
- Quality Control Procedures
- Schedule development and adherence (Phased Turn-Over)
- Organization Chart
- Acquisition of Environmental Permits
- Safety
- Preparation and submission of As-Built documents
- Contract closeout

b) PROJECT SCHEDULE

Schedules will be evaluated for inclusion of all tasks identified in the PROJECT SCHEDULE submittal paragraph above. Offerors who propose and substantiate schedules that result in a period of performance of 450 calendar days or less and illustrate a schedule of the phased turnover of finished units

will receive a more favorable evaluation. Shorter project schedules will be evaluated more favorably. Proposals that include unrealistic or unsupported schedules will be evaluated unfavorably. The 450 calendar days for completion of Task Order No. 1 represents design and construction seasons time

c) HEALTH AND SAFETY RECORD

Offerors who have minimal health and safety incident rates will receive a more favorable evaluation.

5.2.7 TAB 10 UTILIZATION OF SMALL BUSINESS CONCERNS – SUBMITTAL REQUIREMENTS

a) DEFINITIONS

(1) Small Business Concerns. For the purpose of this section, small business concerns refer to Small Business, Small Disadvantaged Business, Women-Owned Small Business, HUBZone Small Business, and Service Disabled Veteran-Owned Small Businesses.

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

(3) Offeror. For the purpose of this section, Offeror refers to both large and small contractors.

(4) Floor. Floor is the term the U.S. Army Corps of Engineers uses to replace goal. It represents the minimum level for small business performance.

b) SMALL BUSINESS

Only large business concerns are required to submit information for Tab 10 UTILIZATION OF SMALL BUSINESS CONCERNS. Small business concerns should state their business size classification based on the NAICS code and size standard in Section 00100 of the solicitation on a separate sheet of bond paper.

c) LARGE BUSINESS

Only large business concerns are required to submit information for Tab 10 UTILIZATION OF SMALL BUSINESS CONCERNS, which consists of 5 sub-factors: Subcontracting Floors, Mitigation Efforts, Utilization of Small Business Concerns, Description of Subcontracted Supplies and Services, and Acknowledgements. **Offerors should submit this information in the format of a Small Business Subcontracting Plan for the indefinite delivery contract in accordance with FAR Clause 52.219-9, "Small Business Subcontracting Plan."** An editable template of a subcontracting plan in Microsoft Word format is included on the CD-ROM. Offerors are cautioned that the template is generic and must be tailored significantly to comply with the submittal requirements of this solicitation.

The Offeror (only if a large business) should demonstrate how it plans to identify, commit, and utilize Small Business (SB), Small Disadvantaged Business (SDB), Women-Owned Small Business (WOSB), HUBZone, and Severely Disabled Veteran-Owned Small Business (SDVOSB) concerns as

team members, subcontractors and/or suppliers in the performance of the resultant contract of this solicitation. It is the policy of the U.S. Army Corps of Engineers that small business concerns have the maximum practicable opportunity to participate meaningfully in contracts. It is further the policy of the U.S. Army Corps of Engineers that Offerors (large business only) demonstrate the extent they plan to utilize small business concerns in any resultant contract and provide assurance in its offer that small business concerns will have maximum subcontracting opportunities. The plan should clearly state factors that demonstrate a strong commitment to use small business concerns.

(1) Subcontracting Floors: The Offeror (only if a large business) should develop and identify percentage floors based on planned subcontracting that is challenging yet realistic. The following floors are considered reasonable and obtainable for the resulting contract:

(i.) 57.2% of planned subcontracting dollars to be placed with all small business concerns.

(ii.) 8.9% of planned subcontracting dollars to be placed with those small business concerns owned and controlled by socially and economically disadvantaged individuals.

(iii.) 8.1% of planned subcontracting dollars to be placed with women-owned small business concerns.

(iv.) 3% of planned subcontracting dollars to be placed with service-disabled veteran-owned small business.

(v.) 3% of planned subcontracting dollars to be placed with HUBZone concerns.

(2) Mitigation Efforts: The Offeror (only if a large business) should identify efforts that demonstrate its strategy to mitigate the effects of full and open competition on small business concerns. Specific examples of mitigation efforts via subcontracting include (but are not limited to):

(i.) Teaming with small businesses.

(ii.) Utilization of the Small Business Administration "PRO-*NET*" web site to research small business concerns (www.pronet.sba.gov).

(iii.) Exceed the small business subcontracting floors stated above in the sub-factor for SUBCONTRACTING FLOORS.

(iv.) Apply small business subcontracting goals toward actual dollars awarded rather than a percentage of subcontracting dollars.

(v.) Ensure original small business team members have substantial subcontracting opportunities and preferences throughout the life of the contract.

(vi.) Assurances that all members of the Offeror’s team understand the rules, regulations and procedures governing the review of subcontracting plan, subcontracting reporting, and subcontracting compliance audits.

(vii.) Ensure periodic review small business subcontracting plan compliance.

(3) Utilization of Small Business Concerns: The Offeror (only if a large business) should demonstrate utilization and participation of small business concerns (clearly stated factors that demonstrate strong commitments) as team members, subcontractors, and/or suppliers.

(4) Description of Subcontracted Supplies and Services: The Offeror (only if a large business) should describe the supplies and services to be subcontracted and planned for subcontracting to SB, SDB, WOSB, SDVOSB, and HUBZone concerns.

(5) Acknowledgements

(i.) The Offeror (only if a large business) should acknowledge: The Offeror will include FAR Clause 52.219-8, "Utilization Of Small Business Concerns" in all subcontracts that offer further subcontracting opportunities. The Offeror will require subcontractors (including small business concerns) that receive subcontracts in excess of $500,000 for supplies or services and $1,000,000 for construction to adopt a small business participation program similar to the requirements of the resulting contract. The resulting subcontracting plan is a material part of the resulting contract. Therefore, failure to comply in good faith with the requirements of the subcontracting plan is in material breach of contract and can result in the Government assessing liquidated damages as stated in FAR Subpart 19.702.

(ii.) The Government may conduct comprehensive subcontracting compliance visits by the Contracting Officer (CO), Administrative Contracting Officer (ACO), and/or Small Business Administration.

(iii.) The Government may re-negotiate the subcontracting plan in the resulting contract if it is determined to be in the Government's best interests.

(iv.) The Government may negotiate subcontracting plans on individual task orders and apply goals/floors toward actual dollars awarded rather than a percentage of subcontracting dollars if it is determined to be in the Government's best interests.

(v.) The Offeror will be required to twice annually (March and September) submit Standard Form 294, "Subcontracting Report for Individual Contracts" and Standard Form 295, "Summary Subcontract Report."

(vi.) The Offeror will include subcontracting plan compliance as an agenda item at periodic partnering meetings.

5.2.8 TAB 10 UTILIZATION OF SMALL BUSINESS CONCERNS – EVALUATION

a) SMALL BUSINESS

Small business concerns will receive the highest evaluating rating under TAB 10 UTILIZATION OF SMALL BUSINESS CONCERNS.

b) LARGE BUSINESS

Offerors (only if a large business) will be formally evaluated under Tab 10 UTILIZATION OF SMALL BUSINESS CONCERNS which consists of 5 sub-factors that are listed in descending order of importance: Subcontracting Floors, Mitigation Efforts, Utilization of Small Business Concerns, Description of Subcontracted Supplies and Services, and Acknowledgements. Army Federal Acquisition Regulation Supplement (AFARS) Appendix DD "Subcontracting Plan Evaluation Guide" will be referenced during the evaluation of the submittals for this factor.

(1) Subcontracting Floors: Offerors who propose subcontracting floors that exceed the suggested floors will receive a more favorable evaluation than Offerors with floors that merely meet the suggested floors.

(2) Mitigation Efforts: Offerors who demonstrate innovative and effective mitigation strategies in small business subcontracting will receive a more favorable evaluation than Offerors who merely meet the Government's minimum requirements.

(3) Utilization of Small Business Concerns: Offerors will be evaluated on their proposed utilization and participation of small business concerns as team members, subcontractors, and/or suppliers in the resulting contract. The Offeror's will be evaluated on it commitments that small business concerns will have maximum subcontracting opportunities. Enforceable commitments to use small business concerns will receive more favorable evaluations than non-enforceable commitments.

(4) Description of Subcontracted Supplies and Services: Offerors will be evaluated on their proposed utilization of supplies and services to be subcontracted and planned for subcontracting to SB, SDB, WOSB, SDVOSB, and HUBZone concerns. The Offerors will be evaluated on commitments to utilizing supplies and services to be subcontracted and planned for subcontracting to SB, SDB, WOSB, SDVOSB, and HUBZone. Enforceable commitments to use small business concerns will receive more favorable evaluations than non-enforceable commitments.

(5) Acknowledgments: Offerors who acknowledge the Government's subcontracting compliance efforts will receive a favorable evaluation. Offerors who omit acknowledgements to the Government's subcontracting compliance efforts will receive a less favorable evaluation. Offerors who qualify their acknowledgements to the Government's subcontracting compliance efforts may receive a less favorable evaluation depending on the effect of the qualification.

5.2.9 PRICE – SUBMITTAL REQUIREMENTS

Submittals for PRICE shall be in a separate binder as labeled as Volume III and consisting of the following:

a) COVER LETTER

The Offeror should submit a cover letter containing:

(1) Solicitation number.
(2) Name, address, e-mail, and telephone and facsimile numbers of the Offeror.
(3) Names, titles, e-mail, and telephone and facsimile numbers of persons authorized to negotiate on the Offeror's behalf with the Government in connection with this solicitation.
(4) Name, title, and signature of the person authorized to sign the proposal.

(5) A statement specifying agreement with all terms, conditions provisions included in the solicitation.

(6) Acknowledgement of all amendments to the solicitation (if applicable).

(7) Deviations From the Solicitation: Offerors should specifically identify, in a section entitled "DEVIATIONS," any significant deviations from the minimum solicitation requirements in Phase 2. All alternates should be addressed and expanded upon in the appropriate tab in the proposal. This section is not intended for minute deviations and is separate from the deviation requirements in Section 00110, Tab 7b, SUPPORTING DATA HOUSING UNIT DESIGN and Tab 8c, SUPPORTING DATA SITE DESIGN.

(8) Identification Of Items Exceeding Solicitation Requirements: Offerors should list all significant items exceeding the minimum solicitation requirements in Phase 2. The list shall be entitled "IDENTIFICATION OF ITEMS EXCEEDING SOLICITATION REQUIREMENTS." All items listed shall be addressed and expanded upon in the appropriate tab in the proposal. This section is not intended for minute items exceeding requirements and is separate from the betterment requirement in Section 00110, Tab 7b, SUPPORTING DATA HOUSING UNIT DESIGN and Tab 8c SUPPORTING DATA SITE DESIGN.

b) STANDARD FORM 1442 AND SECTION 00010

Offerors are required to submit a Standard Form 1442 (SF 1442) with Blocks 14-20 completed. Amendments shall be also be acknowledged in Block 19 of the SF 1442 in addition to the cover letter. Offerors should also submit a completed Section 00010, PRICING SCHEDULE. ***Note. It is the Government's intention to use the prices and percentages indicated by the "successful" Proposer in the Pricing Schedule for Task Order No. 1 to negotiate future Task Orders.***

c) GUARANTEE

The Offerors are required to furnish a guarantee in the form of a firm commitment (e.g., bid bond supported by good and sufficient surety or sureties acceptable to the Government, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States.) The amount of the guarantee shall be 20% percent of the price or $3,000,000, whichever is less. See also Section 00100, BID GUARANTEE.

5.2.10 PRICE – EVALUATION

The Cover Letter and SF 1442 will only be used in evaluating the Offeror's responsiveness, conformance to the solicitation, and eligibility for award. Section 00010, Price Schedule will be evaluated separately from other evaluation factors in Volumes I and II considering price reasonableness. A comparison of proposed price versus other price proposals and the Government Estimate will allow evaluation of price reasonableness.

6 FUNDING

The Design/Construction Cost Limitation (DCCL) for Phase 3 (Task Order No. 1) will be subject to the funds available. The DCCL for Phase 3 is $15,236,000. The Government reserves the right to reject any proposals that exceed these given DCCL. However, the Government may choose to award at more than the DCCL if deemed in the best interest of the Government to do so.

7 COMPETITIVE RANGE

Upon completion of Phase 2 evaluations, and if discussions are determined to be necessary, the Government may establish a competitive range for the purpose of conducting discussions. The competitive range shall be determined on the basis of the factors stated in the solicitation and shall only include proposals that have a reasonable chance of being selected for award. Offerors submitting proposals determined outside of the competitive range (lacking a reasonable chance of being selected for contract award) will be notified in writing at the earliest practicable time.

8 FINAL PROPOSAL REVISIONS

The Government reserves the right to evaluate Phase 2 proposals and award a contract without discussions with Offerors. Therefore, the Offeror's proposal should contain the Offeror's best terms from a cost or price and technical standpoint. The Government also reserves the right to enter into discussions if determined to be in the Government's best interests. Proposal revisions in Phase 2 (if required) will be received at the time and place established by the Contracting Officer and communicated to the Offerors in the competitive range. Changes to evaluated factors in the proposal revisions will be reviewed and evaluated.

9 SELECTION PROCEDURES

When combined, the evaluation factors in Volume I and II are of approximately equal importance to the price factors in Volume III. Evaluations from Volumes I, II, and III will be compared utilizing the Tradeoff Process in FAR Subpart 15.101-1 in which the Government may accept other than the lowest priced proposal that represents the best overall value to the Government. After a selection has been made, the Government will contact the selected Offeror, advising the selection. The Government may reject any or all offers if such action is determined to be in the best interests of the Government.

10 AWARD OF CONTRACT

The Government will award a contract resulting from this solicitation, subject to availability of funds, to the responsible Offeror whose proposal conforms to the solicitation, represents the best value of all factors considered and is judged to be the most advantageous to the Government.

11 DEBRIEFING

In accordance with FAR Subpart 15.505 and 15.506, the Offeror may request either a pre-award or post-award debriefing in writing within three calendar days of notice of elimination from competition. Each Offeror is entitled to only one debriefing per acquisition. Debriefing of Offerors, successful or unsuccessful, will be conducted by the Contracting Officer. The Contracting Specialist will coordinate and schedule the debriefings. Debriefing participation will include the Contracting Officer, chairperson of the SSEB, and Contracting Specialist with additional support from other members of the SSEB as required.

12 PROPOSAL EXPENSES AND PRECONTRACT COSTS

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

13 RELEASE OF INFORMATION

After receipt of proposals and until contract award, source selection information will not be furnished to any firm.

REPLACE FAMILY HOUSING, PHASE 3
ELLSWORTH AFB, SD

PERFORMANCE SUMMARY SHEET (CONSTRUCTION)

SOLICITATION NUMBER DACA45-03-R-0014

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:

____ Exceptional

____ Above Average

____ Average

____ Marginal

____ Unacceptable

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:

PERFORMANCE SUMMARY SHEET

SOLICITATION NUMBER DACA45-03-R-0014

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):

PERFORMANCE SUMMARY SHEET (DESIGN)

SOLICITATION NUMBER DACA45-03-R-0014

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:

____ Exceptional

____ Above Average

____ Average

____ Marginal

____ Unacceptable

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:

PERFORMANCE SUMMARY SHEET Designers (Part 2)

SOLICITATION NUMBER DACA45-03-R-0014

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):

NET FLOOR AREA CALCULATION WORKSHEET
(Page 1 of 2)

PROPOSER _____ UNIT TYPE _____

Exterior Wall Thickness: _____ inches

Gross Square Footage: _____ SF (See Figures 4.1, 4.2 & 4.3 of Air Force Family Housing Guide)

NET AREA CALCULATIONS:

1. INTERIOR AREA (area within inside finishes of exterior walls):

Dimensions: _____ x _____ = _____SF

_____ x _____ = _____SF

_____ x _____ = _____SF

TOTAL INTERIOR AREA SF = _____SF

2. EXCLUDABLE AREA (if included in interior area above) (Dimensions to center line of enclosing interior partitions):

a. Utility Room:

Dimensions: _____ x _____ = _____SF

b. Laundry Room (if not in utility room)

Dimensions: _____ x _____ = _____SF

c. Washer and Dryer Space (if not already included in separate utility or laundry room. Allowable is 30 SF)

= _____SF

d. Interior Bulk Storage Rooms: (do not include bedroom/bathroom closets and entry way closets)

Dimensions: _____ x _____ = _____SF

_____ x _____ = _____SF

_____ x _____ = _____SF

NET FLOOR AREA CALCULATION WORKSHEET
(Page 2 of 2)

PROPOSER _____ UNIT TYPE _____

e. Furnace/Air Cond/DHW/Ductwork/Stacks (if not included in other excludable areas):

Dimensions: _____ x _____ = _____SF

f. Greenhouse (if used in a passive solar design):

Dimensions: _____ x _____ = _____SF

g. Stairway (to basement if included):

Dimensions: _____ x _____ = _____SF

h. Unfinished attic space and basements; porches, open or screened; terraces and patios; garages; and other solar appurtenances (only if included in interior area calculations):

Dimensions: _____ x _____ = _____SF

_____ x _____ = _____SF

_____ x _____ = _____SF

i. Additional space needed for handicap adaptability (as appropriate and only if not included in other excludable areas):

Dimensions: _____ x _____ = _____SF

j. TOTAL EXCLUDABLE SPACE = _____SF

3. Net Area (subtract 2.j. from 1.):

TOTAL NET AREA = _____SF

(basic = _____SF, maximum = _____SF)

KITCHEN CABINET SIZE CALCULATION WORKSHEET
Page 1 of 1

PROPOSER _____ UNIT TYPE _____

	Provided	Required
Wall Cabinet	_____SF	_____SF
Base Cabinet	_____SF	_____SF
Drawer Area	_____SF	_____SF
Counter Top*	_____SF	_____SF
Percentage of Required Area	_____SF	_____SF

* Excludes counter top area taken by sink and range.

CONSTRUCTION MATERIALS, PRODUCTS, EQUIPMENT AND SYSTEMS

For **each** listed item of construction materials, products, equipment and systems below provide the following information:

A. Manufacturer, Grade, Type, Thickness, Finishes, Warranty Period, Model Number and any other information that will describe the item being provided. Only applicable information shall be provided. A Standard Form (Construction Materials, Products, Equipment, and Systems) will be e-mailed to the Phase 2 Proposers for their use in filling out product information. The file will be in Microsoft WORD. Edit and print as many as needed for completion of products offered in TABS 7B and 8C, for supporting housing and site data. Edit as appropriate for each category and item listed within the following pages. Submit one form for each item listed. The Contractor may generate an equivalent form that utilizes the same format as this standard form.

B. Manufacturer's Data Cut-Sheet and Proposal Reference Location Number for each item listed.

Identify any item that is considered as Betterments (Exceeds the requirements of the solicitation). This shall be noted in the information to be provided for each item and shall also be listed under Betterments item below.

Identify any item that is considered a Deviation to the requirements of the solicitation. This shall be noted in the information to be provided for each item and shall also be listed under Deviations item below.

CONSTRUCTION MATERIALS, PRODUCTS,

EQUIPMENT, AND SYSTEMS

1. HOUSING UNIT EXTERIOR MATERIALS AND FINISHES (Or items 1 through 9 as applicable)

EXTERIOR WALLS (Or appropriate category as applicable)

FRAMING (Or appropriate item as applicable)

Manufacturer – Source	
Product Name	
Model Number	
Size – Capacity	
Grade – Type – Classification	
Use – Location	
Warranty – Period	
Description	
Recycled Content	
Other Characteristics	
Betterment (Yes/No/NA – Explain)	
Deviation (Yes/No/NA – Explain)	

1. HOUSING UNIT EXTERIOR MATERIALS AND FINISHES

Exterior Walls

Foundation System
Foundation Dampproofing System
Foundation Drainage System
Framing
Air Infiltration Barrier
Siding
Fascia / Trim
Soffit
Doors and Hardware
Windows / Screens
Garage Doors

Roof

Framing
Ice & Water Barrier
Shingles
Attic Ventilation

2. HOUSING UNIT INTERIOR MATERIALS AND FINISHES

Walls, Floors & Finishes

Concrete Floors on Grade
Framing
Structural Floor Decking
Doors and Hardware (All Areas)*
Stairs & Railings
Floor Covering (All Rooms)* (Catalog Cut & Spec)
Wall & Ceiling Finish (Paint) – All Rooms*
Trim (All Rooms)*
Window Treatment (Catalog Cut & Spec)

* - A schedule may be provided for these items along with other required data.

Bathroom

Water Closets
Sinks
Faucets
Bathtub and/or Shower Enclosure
Vanities, Cabinets & Hardware

Kitchen

Cabinets and Hardware
Sinks
Faucets
Counter Tops

3. SITE EQUIPMENT AND MATERIALS

Playground Equipment
Landscaping Materials
Patio and Good Neighbor Fencing
Water Distribution
Sanitary Sewer
Exterior Electrical Distribution
Gas Distribution

4. HOUSING UNIT MECHANICAL SYSTEMS

Water Heater
Heating (Furnace)
Air-Conditioning **(evaporator & condensing unit)**
Exhaust Systems **(including Radon Ran w/visual light**

5. HOUSING UNIT ELECTRICAL SYSTEMS

Distribution Panel
Electrical Wiring
Lighting Fixtures (Each Type)
Communication Systems (Telephone & Cable T.V.)

6. APPLIANCES

Refrigerator
Range
Range Hood
Dish Washer
Garbage Disposal
Ceiling Fans

7. BETTERMENTS

Provide a list of Betterments (materials, products, equipment, systems, etc) that exceed the basic requirements of the solicitation. This includes consideration of the items listed above and any other items furnished as part of the construction and delivery of the housing units.

8. DEVIATIONS

Provide a list of all other deviations, deemed necessary by the Offeror, to achieve cost limitations, meet statutory requirements, and/or are mandatory due to technical flaws in the solicitation (i.e. performance, structural integrity, safety, maintainability, applicable code

requirements, etc) in order to deliver the intended basic requirements of the solicitation. Each deviation shall include an explanation of why the Offeror believes the deviation is necessary. The Government believes the solicitation requirements are technically sound, comply with all statutory requirements, and are awardable within the specified cost limitation. Deviations that, in the Government's evaluation, negatively conflict with the solicitation requirements may be evaluated unfavorably or even result in rejection of the proposal as non-responsive.

9. RECOVERED MATERIALS

Provide a list of all proposed materials composed of recovered (recycled) materials

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SECTION 00600
REPRESENTATIONS, CERTIFICATIONS & OTHER STATEMENTS OF OFFERORS

INDEX

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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* - CLAUSES, WHICH MAY BE INCORPORATED BY REFERENCE

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 52.217-9 OPTION TO EXTEND THE TERM OF THE CONTRACT

As prescribed in 17.208(g), insert a clause substantially the same as the following:

Option to Extend the Term of the Contract (Mar 2000)

(a) The Government may extend the term of this contract by written notice to the Contractor prior to the expiration of the current contract period; provided that the Government gives the Contractor a preliminary written notice of its intent to extend at least sixty (60) days before the contract expires. The preliminary notice does not commit the Government to an extension.

(b) If the Government exercises this option, the extended contract shall be considered to include this option clause.

(c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed 10 years and zero (0) (months)(years).

(End of clause)

27. *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)

28. *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)

29. *FAR 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (JAN 2002) [<u>When Contracting By Negotiations</u>]

(a) This clause does not apply to small business concerns.

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

"Commercial item" means a product or service that satisfies the definition of commercial item in section 2.101 of the Federal Acquisition Regulation.

"Commercial plan" means a subcontracting plan (including goals) that covers the offeror's fiscal year and that applies to the entire production of commercial items sold by either the entire company or a portion thereof (*e.g.*, division, plant, or product line).

"Individual contract plan" means a subcontracting plan that covers the entire contract period (including option periods), applies to a specific contract, and has goals that are based on the offeror's planned subcontracting in support of the specific contract, except that indirect costs incurred for common or joint purposes may be allocated on a prorated basis to the contract.

"Master plan" means a subcontracting plan that contains all the required elements of an individual contract plan, except goals, and may be incorporated into individual contract plans, provided the master plan has been approved.

"Subcontract" means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime Contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

(c) The offeror, upon request by the Contracting Officer, shall submit and negotiate a subcontracting plan, where applicable, that separately addresses subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business concerns, small disadvantaged business, and women-owned small business concerns. If the offeror is submitting an individual contract plan, the plan must separately address subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns, with a separate part for the basic contract and separate parts for each option (if any). The plan shall be included in and made a part of the resultant contract. The subcontracting plan shall be negotiated within the time specified by the Contracting Officer. Failure to submit and negotiate the subcontracting plan shall make the offeror ineligible for award of a contract.

(d) The offeror's subcontracting plan shall include the following:

(1) Goals, expressed in terms of percentages of total planned subcontracting dollars, for the use of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns as subcontractors. The offeror shall include all subcontracts that contribute to contract performance, and may include a proportionate share of products and services that are normally allocated as indirect costs.

(2) A statement of—

(i) Total dollars planned to be subcontracted for an individual contract plan; or the offeror's total projected sales, expressed in dollars, and the total value of projected subcontracts to support the sales for a commercial plan;

(ii) Total dollars planned to be subcontracted to small business concerns;

(iii) Total dollars planned to be subcontracted to veteran-owned small business concerns;

(iv) Total dollars planned to be subcontracted to service-disabled veteran-owned small business;

(v) Total dollars planned to be subcontracted to HUBZone small business concerns;

(vi) Total dollars planned to be subcontracted to small disadvantaged business concerns; and

(vii) Total dollars planned to be subcontracted to women-owned small business concerns.

(3) A description of the principal types of supplies and services to be subcontracted, and an identification of the types planned for subcontracting to—

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(4) A description of the method used to develop the subcontracting goals in paragraph (d)(1) of this clause.

(5) A description of the method used to identify potential sources for solicitation purposes (*e.g.*,

existing company source lists, the Procurement Marketing and Access Network (PRO-Net) of the Small Business Administration (SBA), veterans service organizations, the National Minority Purchasing Council Vendor Information Service, the Research and Information Division of the Minority Business Development Agency in the Department of Commerce, or small, HUBZone, small disadvantaged, and women-owned small business trade associations). A firm may rely on the information contained in PRO-Net as an accurate representation of a concern's size and ownership characteristics for the purposes of maintaining a small, veteran-owned small, service-disabled veteran-owned small, HUBZone small, small disadvantaged, and women-owned small business source list. Use of PRONet as its source list does not relieve a firm of its responsibilities (*e.g.*, outreach, assistance, counseling, or publicizing subcontracting opportunities) in this clause.

(6) A statement as to whether or not the offeror included indirect costs in establishing subcontracting goals, and a description of the method used to determine the proportionate share of indirect costs to be incurred with—

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(7) The name of the individual employed by the offeror who will administer the offeror's subcontracting program, and a description of the duties of the individual.

(8) A description of the efforts the offeror will make to assure that small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns have an equitable opportunity to compete for subcontracts.

(9) Assurances that the offeror will include the clause of this contract entitled "Utilization of Small Business Concerns" in all subcontracts that offer further subcontracting opportunities, and that the offeror will require all subcontractors (except small business concerns) that receive subcontracts in excess of $500,000 ($1,000,000 for construction of any public facility) to adopt a subcontracting plan that complies with the requirements of this clause.

(10) Assurances that the offeror will—

(i) Cooperate in any studies or surveys as may be required;

(ii) Submit periodic reports so that the Government can determine the extent of compliance by the offeror with the subcontracting plan;

(iii) Submit Standard Form (SF) 294, Subcontracting Report for Individual Contracts, and/or SF 295, Summary Subcontract Report, in accordance with paragraph (j) of this clause. The reports shall provide information on subcontract awards to small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, women-owned small business concerns, and Historically Black Colleges and Universities and Minority Institutions. Reporting shall be in accordance with the instructions on the forms or as provided in agency regulations.

(iv) Ensure that its subcontractors agree to submit SF 294 and SF 295.

(11) A description of the types of records that will be maintained concerning procedures that have been adopted to comply with the requirements and goals in the plan, including establishing source lists; and a description of the offeror's efforts to locate small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns and award subcontracts to them. The records shall include at least the following (on a plant-wide or company-wide basis, unless otherwise indicated):

(i) Source lists (*e.g.*, PRO-Net), guides, and other data that identify small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns.

(ii) Organizations contacted in an attempt to locate sources that are small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, or women-owned small business concerns.

(iii) Records on each subcontract solicitation resulting in an award of more than $100,000, indicating—

(A) Whether small business concerns were solicited and, if not, why not;

(B) Whether veteran-owned small business concerns were solicited and, if not, why not;

(C) Whether service-disabled veteran-owned small business concerns were solicited and, if not, why not;

(D) Whether HUBZone small business concerns were solicited and, if not, why not;

(E) Whether small disadvantaged business concerns were solicited and, if not, why not;

(F) Whether women-owned small business concerns were solicited and, if not, why not; and

(G) If applicable, the reason award was not made to a small business concern.

(iv) Records of any outreach efforts to contact—

(A) Trade associations;

(B) Business development organizations;

(C) Conferences and trade fairs to locate small, HUBZone small, small disadvantaged, and women-owned small business sources; and

(D) Veterans service organizations.

(v) Records of internal guidance and encouragement provided to buyers through—

(A) Workshops, seminars, training, etc.; and

(B) Monitoring performance to evaluate compliance with the program's requirements.

(vi) On a contract-by-contract basis, records to support award data submitted by the offeror to the Government, including the name, address, and business size of each subcontractor. Contractors having commercial plans need not comply with this requirement.

(e) In order to effectively implement this plan to the extent consistent with efficient contract performance, the Contractor shall perform the following functions:

(1) Assist small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns by arranging solicitations, time for the preparation of bids, quantities, specifications, and delivery schedules so as to facilitate the participation by such concerns. Where the Contractor's lists of potential small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business subcontractors are excessively long, reasonable effort shall be made to give all such small business concerns an opportunity to compete over a period of time.

(2) Provide adequate and timely consideration of the potentialities of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns in all "make-or-buy" decisions.

(3) Counsel and discuss subcontracting opportunities with representatives of small business, veteran-owned small business, service-disabled veteran-owned small business , HUBZone small business, small disadvantaged business, and women-owned small business firms.

(4) Provide notice to subcontractors concerning penalties and remedies for misrepresentations of business status as small, veteran-owned small business, HUBZone small, small disadvantaged, or women-owned small business for the purpose of obtaining a subcontract that is to be included as part or all of a goal contained in the Contractor's subcontracting plan.

(f) A master plan on a plant or division-wide basis that contains all the elements required by paragraph (d) of this clause, except goals, may be incorporated by reference as a part of the subcontracting plan required of the offeror by this clause; provided —

(1) The master plan has been approved;

(2) The offeror ensures that the master plan is updated as necessary and provides copies of the approved master plan, including evidence of its approval, to the Contracting Officer; and

(3) Goals and any deviations from the master plan deemed necessary by the Contracting Officer to satisfy the requirements of this contract are set forth in the individual subcontracting plan.

(g) A commercial plan is the preferred type of subcontracting plan for contractors furnishing commercial items. The commercial plan shall relate to the offeror's planned subcontracting generally, for both commercial and

Government business, rather than solely to the Government contract. Commercial plans are also preferred for subcontractors that provide commercial items under a prime contract, whether or not the prime contractor is supplying a commercial item.

(h) Prior compliance of the offeror with other such subcontracting plans under previous contracts will be considered by the Contracting Officer in determining the responsibility of the offeror for award of the contract.

(i) The failure of the Contractor or subcontractor to comply in good faith with—

(1) The clause of this contract entitled "Utilization Of Small Business Concerns;" or

(2) An approved plan required by this clause, shall be a material breach of the contract.

(j) The Contractor shall submit the following reports:

(1) *Standard Form 294, Subcontracting Report for Individual Contracts.* This report shall be submitted to the Contracting Officer semiannually and at contract completion. The report covers subcontract award data related to this contract. This report is not required for commercial plans.

(2) *Standard Form 295, Summary Subcontract Report.* This report encompasses all of the contracts with the awarding agency. It must be submitted semi-annually for contracts with the Department of Defense and annually for contracts with civilian agencies. If the reporting activity is covered by a commercial plan, the reporting activity must report annually all subcontract awards under that plan. All reports submitted at the close of each fiscal year (both individual and commercial plans) shall include a breakout, in the Contractor's format, of subcontract awards, in whole dollars, to small disadvantaged business concerns by North American Industry Classification System (NAICS) Industry Subsector. For a commercial plan, the Contractor may obtain from each of its subcontractors a predominant NAICS Industry Subsector and report all awards to that subcontractor under its predominant NAICS Industry Subsector.

(End of clause)

30. *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.

31. 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.

32. 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.

33. 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)

34. 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.

35. *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)

36. *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.

37. *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)

38. *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.

39. *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.

40. *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.

41. *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.

42. *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.

43. *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.

44. *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.

45. *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.

46. *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.

47. *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.

48. *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)

49. *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).

50. *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)

51. *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.

52. *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)

53. *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)

54. *FAR 52.223-3 HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997)

(a) "Hazardous material," as used in this clause, includes any material defined as hazardous under the latest version of Federal Standard No. 313 (including revisions adopted during the term of the contract).

(b) The offeror must list any hazardous material, as defined in paragraph (a) of this clause, to be delivered under this contract. The hazardous material shall be properly identified and include any applicable identification number, such as National Stock Number or Special Item Number. This information shall also be included on the Material Safety Data Sheet submitted under this contract.

Material (If none, insert "None")	Identification No.
_____	_____
_____	_____
_____	_____

(c) This list must be updated during performance of the contract whenever the Contractor determines that any other material to be delivered under this contract is hazardous.

(d) The apparently successful offeror agrees to submit, for each item as required prior to award, a Material Safety Data Sheet, meeting the requirements of 29 CFR 1910.1200(g) and the latest version of Federal Standard No. 313, for all hazardous material identified in paragraph (b) of this clause. Data shall be submitted in accordance with Federal Standard No. 313, whether or not the apparently successful offeror is the actual manufacturer of these items. Failure to submit the Material Safety Data Sheet prior to award may result in the apparently successful offeror being considered nonresponsible and ineligible for award.

(e) If, after award, there is a change in the composition of the item(s) or a revision to Federal Standard No. 313, which renders incomplete or inaccurate the data submitted under paragraph (d) of this clause, the Contractor shall promptly notify the Contracting Officer and resubmit the data.

(f) Neither the requirements of this clause nor any act or failure to act by the Government shall relieve the Contractor of any responsibility or liability for the safety of Government, Contractor, or subcontractor personnel or property.

(g) Nothing contained in this clause shall relieve the Contractor from complying with applicable Federal, State, and local laws, codes, ordinances, and regulations (including the obtaining of licenses and permits) in connection with hazardous material.

(h) The Government's rights in data furnished under this contract with respect to hazardous material are as follows:

(1) To use, duplicate and disclose any data to which this clause is applicable. The purposes of this right are to--

(i) Apprise personnel of the hazards to which they may be exposed in using, handling, packaging, transporting, or disposing of hazardous materials;

(ii) Obtain medical treatment for those affected by the material; and

(iii) Have others use, duplicate, and disclose the data for the Government for these purposes.

(2) To use, duplicate, and disclose data furnished under this clause, in accordance with subparagraph (h)(1) of this clause, in precedence over any other clause of this contract providing for rights in data.

(3) The Government is not precluded from using similar or identical data acquired from other sources. (End of clause)

55. *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.

56. *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.

57. 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)

58. *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).

59. 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.

60. *FAR 52.225-9 BUY AMERICAN ACT—CONSTRUCTION MATERIALS (MAY 2002) (For Contracts less than $6.481 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 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).]*

61. *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)

62. *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) [<u>For Contracts between $6.481 and 7.304733 Million</u>]

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

"Component" means an article, material, or supply incorporated directly into a construction material.

"Construction material" means an article, material, or supply brought to the construction site by the Contractor or subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

"Cost of components" means—

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the construction material (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For 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	Quantity	Price (Dollars)*

	Measure		
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.

63. *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.

64. *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)

65. 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)

66. *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.

67. *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.

68. *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.

69. 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)

70. 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

71. 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.

72. *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.

73. *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.

74. *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.

75. *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.

76. 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: _____

77. *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)

78. FAR 52.229-3 FEDERAL, STATE, AND LOCAL TAXES (APR 2003) [For Contracts Exceeding $100,000]

(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.

79. RESERVED

80. 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)

81. *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)

82. *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)

83. 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.

84. *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.

85. RESERVED.

86. *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)

87. *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.

88. *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.

89. *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)

90. *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)

91. *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)

92. 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)

93. 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)

94. *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.

95. *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)

96. *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.

97. RESERVED.

98. 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.

99. *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.

100. *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.

101. *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.

102. 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.

103. *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.

104. *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.

105. 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.

106. *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.

107. *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.

108. *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.

109. *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.

110. 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.

111. *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.

112. 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.

113. *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)

114. *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)

115. *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)

116. *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.

117. 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.

118. *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.

119. *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.

120. 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)

121. *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)

122. 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.

123. 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.

124. 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)

125. *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)

126. *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)

127. 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)

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

(a) Government-furnished property.

(1) The Government shall deliver to the Contractor, for use in connection with and under the terms of this contract, the Government-furnished property described in the Schedule or specifications together with any related data and information that the Contractor may request and is reasonably required for the intended use of the property (hereinafter referred to as "Government-furnished property").

(2) The delivery or performance dates for this contract are based upon the expectation that Government-furnished property suitable for use (except for property furnished "as is") will be delivered to the Contractor at the times stated in the Schedule or, if not so stated, in sufficient time to enable the Contractor to meet the contract's delivery or performance dates.

(3) If Government-furnished property is received by the Contractor in a condition not suitable for the intended use, the Contractor shall, upon receipt of it, notify the Contracting Officer, detailing the facts, and, as directed by the Contracting Officer and at Government expense, either repair, modify, return, or otherwise dispose of the property. After completing the directed action and upon written request of the Contractor, the Contracting Officer shall make an equitable adjustment as provided in paragraph (h) of this clause.

(4) If Government-furnished property is not delivered to the Contractor by the required time, the Contracting Officer shall, upon the Contractor's timely written request, make a determination of the delay, if any, caused the Contractor and shall make an equitable adjustment in accordance with paragraph (h) of this clause.

(b) Changes in Government-furnished property.

(1) The Contracting Officer may, by written notice,

(i) decrease the Government-furnished property provided or to be provided under this contract, or

(ii) substitute other Government-furnished property for the property to be provided by the Government, or to be acquired by the Contractor for the Government, under this contract. The Contractor shall promptly take such action as the Contracting Officer may direct regarding the removal, shipment, or disposal of the property covered by such notice.

(2) Upon the Contractor's written request, the Contracting Officer shall make an equitable adjustment to the contract in accordance with paragraph (h) of this clause, if the Government has agreed in the Schedule to make the property available for performing this contract and there is any--

(i) Decrease or substitution in this property pursuant to subparagraph (b)(1) above; or

(ii) Withdrawal of authority to use this property, if provided under any other contract or lease.

(c) Title in Government property. (1) The Government shall retain title to all Government-furnished property.

(2) All Government-furnished property and all property acquired by the Contractor, title to which vests in the Government under this paragraph (collectively referred to as "Government property"), are subject to the provisions of this clause. However, special tooling accountable to this contract is subject to the provisions of the Special Tooling clause and is not subject to the provisions of this clause. Title to Government property shall not be affected by its incorporation into or attachment to any property not owned by the Government, nor shall government property become a fixture or lose its identity as personal property by being attached to any real property.

(3) Title to each item of facilities and special test equipment acquired by the Contractor for the Government under this contract shall pass to and vest in the Government when its use in performing this contract commences or when the Government has paid for it, whichever is earlier, whether or not title previously vested in the Government.

(4) If this contract contains a provision directing the Contractor to purchase material for which the Government will reimburse the Contractor as a direct item of cost under this contract--

(i) Title to material purchased from a vendor shall pass to and vest in the Government upon the vendor's delivery of such material; and

(ii) Title to all other material shall pass to and vest in the Government upon--

(A) Issuance of the material for use in contract performance;

(B) Commencement of processing of the material or its use in contract performance; or

(C) Reimbursement of the cost of the material by the Government, whichever occurs first.

(d) Use of Government property. The Government property shall be used only for performing this contract, unless otherwise provided in this contract or approved by the Contracting Officer.

(e) Property Administration.

(1) The Contractor shall be responsible and accountable for all Government property provided under this contract and shall comply with Federal Acquisition Regulation (FAR) Subpart 45.5, as in effect on the date of this contract.

(2) The Contractor shall establish and maintain a program for the use, maintenance, repair, protection, and preservation of Government property in accordance with sound industrial practice and the applicable provisions of Subpart 45.5 of the FAR.

(3) If damage occurs to Government property, the risk of which has been assumed by the Government under this contract, the Government shall replace the items or the Contractor shall make such repairs as the Government directs. However, if the Contractor cannot effect such repairs within the time required, the Contractor shall dispose of the property as directed by the Contracting Officer. When any property for which the Government is responsible is replaced or repaired, the Contracting Officer shall make an equitable adjustment in accordance with paragraph (h) of this clause.

(4) The Contractor represents that the contract price does not include any amount for repairs or replacement for which the Government is responsible. Repair or replacement of property for which the Contractor is responsible shall be accomplished by the Contractor at its own expense.

(f) Access. The Government and all its designees shall have access at all reasonable times to the premises in which any Government property is located for the purpose of inspecting the Government property.

(g) Risk of loss. Unless otherwise provided in this contract, the Contractor assumes the risk of, and shall be responsible for, any loss or destruction of, or damage to, Government property upon its delivery to the Contractor or upon passage of title to the Government under paragraph (c) of this clause. However, the Contractor is not responsible for reasonable wear and tear to Government property or for Government property properly consumed in performing this contract.

(h) Equitable adjustment. When this clause specifies an equitable adjustment, it shall be made to any affected contract provision in accordance with the procedures of the Changes clause. When appropriate, the Contracting Officer may initiate an equitable adjustment in favor of the Government. The right to an equitable adjustment shall be the Contractor's exclusive remedy. The Government shall not be liable to suit for breach of contract for--

(1) Any delay in delivery of Government-furnished property;

(2) Delivery of Government-furnished property in a condition not suitable for its intended use;

(3) A decrease in or substitution of Government-furnished property; or

(4) Failure to repair or replace Government property for which the Government is responsible.

(i) 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.

129. *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.

130. *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.

131. *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.

132. 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.

133. 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.

134. 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)

135. *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.

136. *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.

137. 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.

138. 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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SPECIAL CONTRACT REQUIREMENTS
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PART 1 GENERAL

Attachments:
General Wage Decision Nos. SD030003 and SD030004

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 for Task Order No. 1 ready for use not later than the number of calendar days (which includes design, design reviews and all construction activities) indicated by the Contractor in Section 00010TO1 of the awarded Pricing Schedule (Page 3, Item "a"). 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

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 and determines it satisfactory for purposes of beginning construction. The Contractor shall submit the design for Task Order No. 1 as two (2) separate design packages (the first package for the 100% Site and 60% Housing and the second package as the 100% Housing. Site work will include demolition, utilities and foundations. 100% Housing will have final floor plans, elevations and all other requirements as defined in Section 01332. Each package will require design submittals, design reviews and design review conferences as set forth in the Contract (Note: See SECTION 01332: DESIGN SUBMITTAL REQUIREMENTS (TASK ORDER NO. 1) for all design and distribution requirements). 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.The Contractor has the option to perform demolition of housing units during the design process provided required demolition plans, permits, accident prevention plan, quality control plan and any other items required by the Contract to begin work has been accepted by the Government.

(b) If the Government allows the Contractor to proceed with limited construction based on pending minor revisions to the reviewed 100 Percent Corrected Design submission, 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.

1.2 LIQUIDATED DAMAGES-CONSTRUCTION (SEPT 2000)

(a) If the Contractor fails to complete the work within the time

inserted on the PRICING SCHEDULE, 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 CONTRACT INFORMATION

1.4.1 Contract Description

The resulting indefinite delivery contract will be awarded for a 5-year base period and a 5-year option period. The cumulative value of the contract shall not exceed $100,000,000.

1.4.2 Minimum Guarantee

There will be a minimum guarantee of $500,000 for the base period and a minimum guarantee of $250,000 for the option period of the resulting contract. The minimum guarantee will be obligated upon award of the contract or upon exercising the option period.

1.4.3 Task Orders

Firm-fixed price Task Orders will be issued as appropriate during the contract period. Task Orders will not have a maximum or minimum value established. Program amounts are estimated to range from $12 million to $20 million from Fiscal Year 2004 through Fiscal Year 2010. The program amounts are subject to appropriations from Congress. Therefore, the Government is not required to issue a Task Order in a given year because funding or requirements are subject to change. Likewise, the Government may issue multiple Task Orders during a given year or issue Task Orders outside of the estimated range if funding or requirements change. One Task Order per year until 2010 is anticipated based on estimated program amounts.

1.4.4 Task Orders for Professional Services

The Government reserves the right to issue task orders for professional services to allow flexibility in executing the housing program. Professional services are services that do not require a certified architect-engineer firm (i.e., planning, investigating, surveying, mapping, geotechnical, analytical, etc.). Task orders for only professional services will be strictly limited to the scope of the family housing program at the installation and will not include design effort. See also Section 00110, Paragraph 5.1.9(c) OTHER PROFESSIONAL PERSONNEL.

1.5 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 Submittals During Design) 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.

1.6 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.

1.7 ORDER OF WORK

1.7.1 PHASING

The Contractor will be given all the Phase 3 (FY 04) housing units for demolition (80 units) at Notice to Proceed (NTP). The Contractor is prohibited from allowing any workers to live in housing units slated for demolition.

The Contractor shall be required to construct prototypes of each housing unit type as defined below.

The Contractor shall construct a temporary base security fence as shown on the RFP drawings to allow unrestricted access to the project site. After construction and approval of this fence, the project site will be considered to be off-base and not under base security. Prior to construction and approval of this fence, access to the project site will be restricted through base security.

The Contractor shall complete and turn over housing units as they are completed and accepted by the Government. The Contractor shall allow occupant access to the completed housing units.

1.7.2 PROTOTYPE HOUSING UNITS

After contract award, prototype family housing units of each housing type design shall be constructed to demonstrate construction details and quality of construction. Each stage of work shall be completed on the prototype housing unit prior to starting work on the same stage for similar housing units. The prototype family units will be used to verify the details of the accepted design and materials selections and to establish the standards of construction and workmanship against which the remaining project will be judged. Work on each successive stage of the prototype housing unit may begin immediately after the acceptance of the preceding stage. However, a representative sample of the work on one prototype unit for each stage of construction shall be retained for examination within the prototype housing unit (i.e., not worked over, covered, concealed in any way) until completion of that stage of the work throughout the project unless otherwise authorized by the Contracting Officer. As a minimum, the stages of work in the prototype housing unit which shall be subject to acceptance by the Contracting Officer shall include the following:

a. Concrete Footing Inspection
b. Concrete Slab-on-Grade Inspection
c. Foundation Wall Inspection
d. Fist Floor Walls, Second Floor Joists, and Floor Decking Inspection
e. Second Floor Walls, Roof Trusses, Roof Decking, Shingles, Facia Inspection.
f. Exterior Siding and Trim Inspection
g. Doors and Windows Inspection
h. HVAC rough-in Inspection
i. Plumbing and Electrical Rough-in work, including Tub Installation Inspection.
j. Wall Insulation and Attic Ventilation Baffles Inspection
k. Drywall Installation Inspection
l. Drywall finish Inspection
m. Finish Carpentry and Cabinetry Inspection
n. Installation of Lighting, Plumbing and Mechanical Equipment Inspection
o. Hardware Inspection

p. Interior Finishes Inspection
q. Attic Insulation Inspection

As part of the Contractor's Quality Control (CQC) process, digital photos shall be taken by the CQC Manager on all Government inspected and agreed to construction materials and work. The digital files shall be submitted to the Contracting Officer's Representative for record and archive of accepted work. Prototype housing units shall be completed to finished status upon construction and acceptance of all other housing units.

1.8 CONSTRUCTION DRAWINGS AND SPECIFICATIONS

After award of the contract, the successful Contractor will continue to develop drawings from the Phase 2 concept stage through to corrected finals along with completed specifications for construction. Omaha Guide specifications are required for site/civil work and are located on the CD-ROM in folder "Guides", then folder "Omaha". Specsintact software is also provided under folder "Software" to edit the Omaha guides. The Contractor shall develop drawings in accordance with CADD Standards as described in Section 01040. Construction deliverables (drawing, specification and distribution requirements) shall be in accordance with Section 01332: SUBMITTALS DURING DESIGN.

1.9 PHYSICAL DATA (APR 1984)

Data and information furnished or referred to below is for the Contractors' information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

a. The indications of physical conditions on the drawings and in the specifications are the result of site investigations by surveys and 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)

1.10 CONCURRENT CONSTRUCTION

Construction work closely related to and/or located at the site of the work under a concurrent contract, including base contracts will be in progress simultaneously with work under this contract. Construction of Family Housing for the FY02/FY03 project is concurrently being worked at Ellsworth AFB. The Contractor shall cooperate with others as necessary in the interest of timely completion of all work. In the event of interference, the Contracting Officer shall be notified immediately for resolution and his decision shall be final.

1.11 PAYMENT

1.11.1 PROMPT PAYMENT ACT

Pay requests authorized in CONTRACT CLAUSES clause: "Payments Under Fixed-Price Construction Contracts", will be paid pursuant to the clause, "Prompt Payment for Construction Contracts". Pay requests will be submitted on ENG Form 93 and 93a, "Payment Estimate-Contract Performance" and "Continuation". All information and substantiation required by the identified contract clauses will be submitted with the ENG Form 93, and the required certification will be included on the last page of the ENG Form 93a, signed by an authorized contractor official and dated when signed. The designated billing office is the Office of the Area Engineer. At initial turnover stage of housing units, payment will be made based on number of units turned over and accepted by the Government.

1.11.2 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.

1.11.3 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)

1.12 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 at no cost. 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 utility systems. 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.

1.13 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.

1.14 BASE CIVIL ENGINEER WORK CLEARANCE REQUEST (AF FORM 103), "DIGGING PERMIT

The Contractor will be responsible for coordinating a government supplied, Base Civil Engineer Work Clearance Request (AF Form 103) prior to performing digging of any type. The Contractor shall process the digging permit by coordinating with and obtaining signatures from responsible representatives of the organizations listed on the AF Form 103 prior to obtaining final approval from the Air Force Base Civil Engineer or his approved representative. The area requested for clearance for each individual permit shall be limited to a maximum of two (2) weeks production for an individual permit. The Contractor will be given assistance, by the Government, in the execution of the initial two (2) Work Clearance Requests. Thereafter, Government assistance will be limited to an as-needed basis in the event of unusual circumstances. It will be the contractor's responsibility to coordinate the completion of the necessary AF Form 103 and arrange to have existing utilities located as indicated on the completed form, prior to the beginning of digging operations in the individual areas. This coordination is anticipated to take approximately three (3) working days to complete per request, and may require coordination with as many as twenty (20) individuals located on or near the base. A blank copy of the AF Form 103 is included at the end of this section. Any unusual delay in obtaining approval from any particular organization will be reported immediately to the Chief of Construction Management.

(a) Utility Staking Requirements: The Contractor shall layout and mark his intended utility routing before calling for field coordination by utility personnel. This shall be done a minimum of five working days in advance of when digging is expected to begin. Once all responsible utility representatives have field located crossover and/or interference points between the new utility route and existing utilities, and signed off on the digging permit to signify completion of the field coordination of the digging permit, then digging in the area represented by the digging permit may begin. Any utility service markers or markings established by the utility representatives must be maintained by the Contractor through the completion of the digging operations.

(b) Digging Operations: Digging near established interference or crossover points shall be done by hand, five (5) feet either side of the point along the intended route, in order to prevent disturbing the existing utility. If the existing utility is uncovered in the new excavation, it shall be protected from damage and movement while in the open excavation and during backfill. The contractor shall be responsible for the repairs and associated costs for repairs of any utility damaged by construction, whose location was made known to the Contractor.

1.15 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
(14)	(10)	(08)	(05)	(06)	(07)	(04)	(04)	(02)	(02)	(05)	(10)

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)

1.16 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)

1.17 SECURITY REQUIREMENTS

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)

1.18 ACCESS ROUTE AND STAGING

The Contractor shall use the access route and staging area as shown on the RFP drawings.

1.19 CONTRACTOR QUALITY CONTROL (CQC)

See Section 01451AContractor Quality Control.

1.20 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".

1.21 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)

1.22 DAILY WORK SCHEDULES AND WEEKLY COORDINATION MEETINGS

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.

1.23 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 IV. 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)

1.24 AS-BUILT DRAWINGS

See SECTION 01040 - AS-BUILT DRAWINGS

1.25 CONTRACTOR FURNISHED EQUIPMENT DATA AND OPERATION/MAINTENANCE MANUALS

See Section 01200 Warranty of Construction for Contractor Furnished Equipment Data to be submitted as part of the Warranty Equipment Booklet.

The Contractor shall provide each housing unit a copy of Operation and Maintenance Manuals that are typically furnished when building a home

dwelling.

1.26 ACCOMMODATIONS FOR GOVERNMENT INSPECTORS

a. The Contractor may utilize one of the existing housing units scheduled for demolition for accomodating both the Government Inspectors and the Contractors on-site personnel. The exact unit needs to be coordinated with the Contracting Officer. Drinking water facilities, adequate lighting, air-conditioning, heating equipment, and toilet(s) shall be maintained by the Contractor. The Government office shall be furnished with one legal size filing cabinet with four drawers, one drafting table with stool, one plan rack, one desk, and three chairs. Used furniture, in good condition, will be acceptable. Entrance doors shall be equipped with a substantial lock. The Contractor shall provide janitor service and telephone service, all at no cost to the Government, except the Contractor will not be liable for Government long-distance calls. The furniturec will remain the property of the Contractor and shall be removed from the site after completion of the work. The housing unit utilized for this purpose shall not be demolished until the end of the Contract, unless other accomodations for Government inspectors are provided as indicated below.

b. Temporary Government Accomodations shall be provided by the Contractor if one of the existing housing units is not utilized.

The Contractor shall furnish a temporary office facility approximately 10 feet x 40 feet with a minimum of 400 square feet of floor space. It shall be located where directed and shall be reserved for Government personnel only. Drinking water facilities, adequate lighting, air-conditioning, heating equipment, and a partition enclosed chemical toilet shall be furnished and maintained by the Contractor. The office shall be furnished with one legal size filing cabinet with four drawers, one drafting table with stool, one plan rack, one desk, and three chairs. Used furniture, in good condition, will be acceptable. Entrance doors shall be equipped with a substantial lock. The Contractor shall provide janitor service, fuel for the heating facilities, electricity, telephone and water, all at no cost to the Government, except the Contractor will not be liable for Government long-distance calls. Building shall be constructed so as to be easily moved and the Contractor shall relocate the building twice during the contract, if so directed. The entire facility, including furniture, will remain the property of the Contractor and shall be removed from the site after completion of the work.

1.27 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)

1.28 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. Not Used

1.29 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	
Relative difficulty of work	15	Item b.	
Size of Job	15	below	
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.

1.30 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.

1.31 WAGE RATE APPLICATION

1.31.1 Residential Schedule

Applicable to all work required within 5 feet outside the housing unit building lines.

1.31.2 Heavy and Highway Schedule

Applicable to all work required beyond 5 feet outside the housing unit building lines.

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
3.4	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 Rapid City SMSA-6660, which Pennington county 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.

1.34 BASE HOURS

Base operation hours are 6:30 a.m. to 6:00 p.m. daily (Monday through Friday), excluding federal holidays. Access to the base during other times must be requested in writing from the Contracting Officer and will be granted only for extenuating circumstances.

1.35 UPKEEP OF ROADWAYS WITHIN A MILITARY INSTALLATION

In addition to the requirements of Contract Clauses clause "Operations and Storage Areas", the Contractor shall comply with the following requirements. All military installation roads, public roads and streets used or affected by construction operations shall be kept open to traffic at all times during the construction period unless otherwise specified or directed by the Contracting Officer. The Contractor shall keep military installation roads and areas adjacent to the construction site free of debris including litter, waste construction material and mud which are generated by construction operations. Cleaning of roads and areas affected by construction operations shall be done on a continual basis. Drainage from the roads shall not be obstructed by construction work. Road damage resulting from construction operations shall be repaired by the contractor to the satisfaction of the Contracting Officer at no additional cost to the Government.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

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General Decision Number SD020001

General Decision Number SD020001
Superseded General Decision No. SD010001
State: South Dakota
Construction Type:
HEAVY
HIGHWAY
County(ies):

AURORA	EDMUNDS	MCCOOK
BEADLE	FALL RIVER	MCPHERSON
BENNETT	FAULK	MEADE
BON HOMME	GRANT	MELLETTE
BROOKINGS	GREGORY	MINER
BROWN	HAAKON	MOODY
BRULE	HAMLIN	PERKINS
BUFFALO	HAND	POTTER
BUTTE	HANSON	ROBERTS
CAMPBELL	HARDING	SANBORN
CHARLES MIX	HUGHES	SHANNON
CLARK	HUTCHINSON	SPINK
CLAY	HYDE	STANLEY
CODINGTON	JACKSON	SULLY
CORSON	JERAULD	TODD
CUSTER	JONES	TRIPP
DAVISON	KINGSBURY	TURNER
DAY	LAKE	UNION
DEUEL	LAWRENCE	WALWORTH
DEWEY	LYMAN	YANKTON
DOUGLAS	MARSHALL	ZIEBACH

Heavy and Highway Construction Projects

Modification Number	Publication Date
0	03/01/2002

COUNTY(ies):

AURORA	EDMUNDS	MCCOOK
BEADLE	FALL RIVER	MCPHERSON
BENNETT	FAULK	MEADE
BON HOMME	GRANT	MELLETTE
BROOKINGS	GREGORY	MINER
BROWN	HAAKON	MOODY
BRULE	HAMLIN	PERKINS
BUFFALO	HAND	POTTER
BUTTE	HANSON	ROBERTS
CAMPBELL	HARDING	SANBORN
CHARLES MIX	HUGHES	SHANNON
CLARK	HUTCHINSON	SPINK
CLAY	HYDE	STANLEY
CODINGTON	JACKSON	SULLY
CORSON	JERAULD	TODD
CUSTER	JONES	TRIPP
DAVISON	KINGSBURY	TURNER
DAY	LAKE	UNION
DEUEL	LAWRENCE	WALWORTH
DEWEY	LYMAN	YANKTON
DOUGLAS	MARSHALL	ZIEBACH

SUSD3001A 05/26/1998

	Rates	Fringes
CARPENTERS/FORM BUILDERS	12.67	
CONCRETE FINISHERS	13.05	
ELECTRICIANS	13.57	
LABORERS:		
Group 1	8.49	
Group 2	10.74	
Group 3	11.06	
Group 4	12.95	

LABORER CLASSIFICATIONS

GROUP 1 - Air Tool Operator; Common Laborer; Flag Person; Landscape Worker; & Pilot Car Operator

GROUP 2 - Form Builder Tender; Mechanic Tender; & Pipe Layer (Except Culvert)

GROUP 3 - Asphalt Plant Tender; Pile Driver Leadsman; & Form Setter

GROUP 4 - Grade Checker

PAINTERS	9.64	
POWER EQUIPMENT OPERATORS:		
Group 1	9.88	
Group 2	11.01	
Group 3	11.57	
Group 4	12.62	
Group 5	13.98	

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1 - Concrete Paving Cure Machine; Concrete Paving Joint Sealer; Conveyor; Tractor (Farm-type with Attachments); Materials Spreader; & Self-propelled Broom

GROUP 2 - Truck Type Auger; Bulldozer, 80 H.P. or Less; Concrete Paving Saw; Front End Loader, 1.25 Cubic Yards or

Less; Pneumatic Tired Tractor or Crawler (Includes Water Wagon & Power Spray Units); Self-propelled Roller (Except Hot Mix); Sheepsfoot/50 Ton Pneumatic Roller; Wagon Drill; & Air Trac

GROUP 3 - Asphalt Distributor; Backhoe, 1.25 Cubic Yards or Less; Bulldozer, Over 80 H.P.; Concrete Paving Finishing Machine; Crusher (May include internal Screening Plant); Euclid or Dumpster; Front End Loader, Over 1.25 Cubic Yards; Rough Motor Grader; Push Tractor; & Self-propelled Hot-Mix Roller

GROUP 4 - Asphalt Paving Machine Screed-Asphalt Paving Machine; Backhoe, Over 1.25 Cubic Yards; Crane, Derrick, Dragline, Pile Driver or Shovel, 1.25 Cubic Yards or Less; Maintenance Mechanic; Oiler & Greaser; & Scraper

GROUP 5 - Asphalt Plant; Automatic Fine Grader; Milling Machine; Concrete Batch Plant; Crane, Derrick, Dragline, Pile Driver or Shovel, Over 1.25 Cubic Yards; Heavy Duty Mechanic; & Finish Motor Grader

TRUCK DRIVERS:

Group 1	10.04
Group 2	11.59

TRUCK DRIVER CLASSIFICATIONS

GROUP 1 - Tandem Truck Without Trailer or Pup; Single Axle Truck (Over 1 ton) with Trailer

GROUP 2 - Semi-Tractor & Trailer; Tandem Truck with Pup

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

==========

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(v)).

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

General Decision Number SD020008
Superseded General Decision No. SD010008
State: South Dakota Construction Type:
RESIDENTIAL
County(ies):

AURORA	EDMUNDS	MCCOOK
BEADLE	FALL RIVER	MCPHERSON
BENNETT	FAULK	MEADE
BON HOMME	GRANT	MELLETTE
BROOKINGS	GREGORY	MINER
BROWN	HAAKON	MOODY
BRULE	HAMLIN	PERKINS
BUFFALO	HAND	POTTER
BUTTE	HANSON	ROBERTS
CAMPBELL	HARDING	SANBORN
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CORSON	JERAULD	TODD
CUSTER	JONES	TRIPP
DAVISON	KINGSBURY	TURNER
DAY	LAKE	UNION
DEUEL	LAWRENCE	WALWORTH
DEWEY	LYMAN	YANKTON
DOUGLAS	MARSHALL	ZIEBACH

RESIDENTIAL CONSTRUCTION PROJECTS (consisting of single family homes and apartments up to and including 4 stories)

Modification Number	Publication Date
0	03/01/2002
1	04/05/2002

COUNTY(ies):

AURORA	EDMUNDS	MCCOOK		
BEADLE	FALL RIVER	MCPHERSON		
BENNETT	FAULK	MEADE	BON HOMME	GRANT
MELLETTE				
BROOKINGS	GREGORY	MINER		
BROWN	HAAKON	MOODY		
BRULE	HAMLIN	PERKINS		
BUFFALO	HAND	POTTER		
BUTTE	HANSON	ROBERTS		
CAMPBELL	HARDING	SANBORN		
CHARLES MIX	HUGHES	SHANNON		
CLARK	HUTCHINSON	SPINK		
CLAY	HYDE	STANLEY		
CODINGTON	JACKSON	SULLY		
CORSON	JERAULD	TODD		
CUSTER	JONES	TRIPP		
DAVISON	KINGSBURY	TURNER		
DAY	LAKE	UNION		
DEUEL	LAWRENCE	WALWORTH		
DEWEY	LYMAN	YANKTON		
DOUGLAS	MARSHALL	ZIEBACH		

* SFSD0669B 04/01/2002

	Rates	Fringes
SPRINKLER FITTERS	17.73	1.79

SUSD4001A 09/11/2000

	Rates	Fringes
CARPENTERS, Including Form Setting/ Building and Batt Insulation, But Excluding Drywall Hanging	10.56	
CEMENT MASONS/CONCRETE FINISHERS	10.00	
DRYWALL HANGERS	13.80	
ELECTRICIANS, Including Low Voltage Wiring for Phones and Fire Alarms	12.87	1.50
HVAC MECHANICS, Including Duct, Pipe & Setting Systems	12.76	1.50
LABORERS:		
Common	7.20	
Pipelayer	8.00	
PAINTERS:		
Brush; Roller; & Spray	8.29	
PLUMBERS, Excluding HVAC Work	11.60	
POWER EQUIPMENT OPERATORS:		
Backhoe	11.32	
Front End Loader	11.53	

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

==========

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses

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

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

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U.S. Department of Labor
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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

SECTION 01000
GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS
(TASK ORDER NO. 1)
INDEX

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PART 1 - DESIGN AND CONSTRUCTION OBJECTIVES

INDEX

1 DESIGN AND CONSTRUCTION OBJECTIVES

The design and construction of Family Housing Units for Task Order No. 1, FY04, Phase 3 Replace Family Housing shall comply with specifications and requirements contained in this Request for Proposals (RFP). Landscaping shall conform to native type and low maintenance principals. Recreational features shall provide safe and modern focal areas for the neighborhoods. The design and technical criteria contained and cited in this RFP establishes minimum standards for design and construction quality except where maximum sizes are identified for the housing unit net floor area, the number of housing units per building, and the interior/exterior bulk storage spaces. See PART 9 - HOUSING UNIT DESIGN/CONSTRUCTION for architectural space and unit requirements.

1.1 SCOPE OF WORK

Task Order No. 1, FY04 work consists of the demolition of 80 existing units (40 duplexes) and replacing with 75 new family housing units (37 duplexes, of which 38 are three bedroom units and 36 are four bedroom units, with 1 single four bedroom unit being built) in an existing housing development at Ellsworth AFB, SD. New units include 8, 3-Bedroom Junior Enlisted (JENL); 25, 4-Bedroom JENL; 30, 3-Bedroom Senior Non-Commissioned Officer (SNCO); and 12, 4-Bedroom SNCO housing units. All work is dispersed on Government-owned land at Ellsworth AFB, SD.

1.2 REQUIREMENTS AND DESCRIPTIONS OF WORK

1.2.1 NEW HOUSING UNITS

Family housing units with double-car garage, exterior storage, individual central heating systems, energy conservation systems and central air conditioning, the following Contractor-furnished/Contractor-installed (CF/CI) equipment and appliances: refrigerators, garbage disposals, dishwashers, water heaters, range/ovens, range hoods, automatic garage door openers, carbon monoxide detectors and smoke detectors. Occupant-furnished/Occupant-installed (OF/OI) equipment and appliances include the following: microwave ovens (see paragraph “Betterments” for CFCI betterment items), washers and dryers, freezers. Family housing units shall be a mix of one story and/or two-story duplex structures to be determined by the Offeror based on available land and siting requirements. Housing units shall be provided with crawl spaces. Basements will be prohibited. Units shall be designed so that direct access to the garage from the residence is accomplished without exterior exposure. Family housing distribution shall be as shown in Table 1-1. See PART 9 - HOUSING UNIT DESIGN/CONSTRUCTION for specific requirements and standards of design and construction for the housing units.

TABLE 1-1 - HOUSING UNITS		
Pay Grade	Number of Bedrooms	Number of New Units
(JENL) E1-E3	3 BR	8
(SNCO) E7-E-8	3 BR	30
JENL E1-E3	4 BR	23
SNCO E7-E-8	4 BR	10
(JENL) E1-E3 (Handicap Accessible)	4 BR	2
(SNCO) E7-E-8 (Handicap (Accessible)	4 BR	2

1.2.2 SIZE STANDARDS

See the Air Force Housing Design Guide for square footage requirements Table 1-2 Size Standards. The table indicates the allowable size standards with regard to Net Square Footage (NSF) and Gross Square Footage (GSF) for dwelling units listed above. For "Construction" and under "Replacement", a minimum and a maximum range are given. It is the desire of the Base to achieve the maximum square footage for each unit. Design-Build submissions will be evaluated more favorably if square footage is offered closer to the maximum NSF/GSF, within the given site boundaries and cost limitation. Maximums (NSF & GSF) from Table 1-2 shall not be exceeded. The range allows the Design-Build Contractor some flexibility to offer maximums, or closer to maximums to achieve this goal. See PART 9 - HOUSING UNIT DESIGN/CONSTRUCTION for specific size and space for the housing units.

1.2.2.1 Definition of Gross Floor Area

Air Force size standards based on Gross Floor Area are defined as follows:

- Gross Floor Area includes all interior spaces (finished and unfinished) within the exterior faces of exterior walls and centerline of party walls (in multiplex units) of housing units with the following exclusions:

    (1) Carports and Garages
    (2) Exterior Bulk Storage (detached)
    (3) Trash Enclosures
    (4) Porches open or closed which are not heated or cooled and which retain the basic characteristic of a porch.
    (5) Terraces, Patios, Decks, Balconies, and Entrance stoops.

TABLE 1-2 SIZE STANDARDS

AIR FORCE DESIGN GUIDE

		REPLACEMENT & NEW CONSTRUCTION MINIMUM		REPLACEMENT & NEW CONSTRUCTION MAXIMUM		GARAGES	
Grade	Bedrooms	NSF	GSF	NSF	GSF	Detached Homes	Attached Homes
JENL	2	950	1180	1210	1500	2 car	1-2 car
(E1-E3)	3	1200	1490	1420	1760	2 car	1-2 car
	4	1350	1670	1790	2220	2 car	1-2 car
	5	1550	1920	2150	2670	2 car	1-2 car
JNCO	2	950	1180	1210	1500	2 car	1-2 car
(E4-E6)	3	1200	1490	1420	1760	2 car	1-2 car
	4	1350	1670	1790	2220	2 car	1-2 car
	5	1550	1920	2150	2670	2 car	1-2 car
SNCO	2	950	1180	1440	1790	2 car	1-2 car
CGO	3	1350	1670	1650	2050	2 car	1-2 car
(E7-E8)	4	1450	1800	2020	2500	2 car	1-2 car
	5	1550	1920	2490	3090	2 car	1-2 car
FGO	3	1400	1740	1850	2300	2 car	1-2 car
(E9)	4	1550	1920	2180	2700	2 car	1-2 car
SO	4	1700	2110	2350	2920	2 car	1-2 car
GO	4	2100	2600	3270	4060	2 car	1-2 car

1.2.3 ACCESSIBLE UNITS

Two of the 4-bedroom JENL units and two of the 4-bedroom SNCO units in Task Order No. 1 shall be single-story housing units with special accessibility features. See PART 9 - HOUSING UNIT DESIGN/CONSTRUCTION for requirements and standards of design and construction for exterior and interior accessibility.

1.2.4 SITE AREA AND DENSITY

The site boundary of Task Order No. 1, FY04, Phase 3 is indicated on the RFP drawings. Upon demolition of the required units, new housing units shall be built within the site boundary indicated at the required set backs and easements to achieve an optimum site density. Site design will include all associated amenities and site improvements (i.e. grading, storm drainage, sewer, erosion control, pedestrian and vehicular circulation, utility systems, playgrounds, common areas, etc.) to support the new housing.

1.2.5 DEMOLITION

a) See PART 4 - SITE for demolition requirements and photos of the existing housing units. Units to be removed and typical floor plans are shown on the RFP drawings.

b) The Base Environmental office will remove all mercury thermostats, fluorescent light tubes and any PCB ballast prior to demolition. The housing units have been surveyed for asbestos, lead-based paint, and radon. The Contractor shall remove and dispose of all asbestos and lead paint. The Contractor shall be responsible for locating disposal facilities, which will accept solid waste containing lead-based paint. Waste areas do not exist on the Base, nor are there any Government controlled waste sites in the general vicinity, for the disposal of ACM. See Attachment 2 for Ellsworth AFB Asbestos and Lead Base Paint Assessments, which indicate locations of asbestos and lead-based paint in the housing units and Section 01400 for demolition requirements related to structures containing lead-based paint and/or asbestos. The Contractor will also handle the disposal of refrigerators left in the units. If the Contractor chooses to reuse or sell the existing refrigerator, Freon recycling is not required. If the Contractor decides to dispose of the refrigerators, Freon will have to be removed/recycled prior to disposal in accordance with 40 CFR 82.

c) See PART 8 - UTILITIES for removal requirements for water, sanitary sewer, communication lines and equipment, cable TV lines and equipment, and removal requirements for power lines and equipment.

1.2.6 DESIGN FREEDOM

Requirements stated in this RFP are minimums except where maximum sizes are identified for the housing unit net floor area, number of housing units per building, and the interior/exterior bulk storage spaces (or other areas indicated as maximum). Innovative, creative, or cost-saving proposals, which meet or exceed these minimum requirements (maximum requirements and the cost limitation cannot be exceeded) are encouraged and will receive more favorable ratings accordingly. Companies, which meet the requirements of Section 00110, and have existing housing plans or modifications that meet the design and construction criteria specified herein and which have previously been constructed and priced, are encouraged to submit. They may include designs incorporating factory-fabricated components or modules. Deviations from space and adjacency requirements are discouraged unless the changes result in improvement to the facilities. Sections, which include products by reference to industry standards of a particular type, are intended to demonstrate the Government's minimum salient features for that type of work. Where minimum standards are not indicated herein, the guidelines provided in the Air Force Family Housing Guide (December 1995) define the minimum acceptable standards and the objectives to be met. Where the Air Force Family Housing Guide allows options, the Contractor will use the most beneficial option stated.

1.2.6.1 Housing Units

All replacement units for Task Order No. 1 shall be built in duplex configuration (with the exception of the single four-bedroom unit and the four-bedroom special accessible units). A duplex is defined as a one or two-story building, housing 2 dwelling units joined together by a common party wall and each dwelling unit entered separately and directly from the exterior.

a) Site-built, factory-built, and manufactured housing units are acceptable options for this project if all requirements specified in this RFP are met. Definitions for acceptable type construction practice on Task Order No. 1 duplex housing units are as follows:

(1) Site-built housing. A residential building or housing unit wholly or substantially constructed at the site.

(2) Factory-Built Housing: Construction consisting of components, sub-assemblies such as modules, panelized walls, roof trusses, floor joists, and other factory-assembled components, which are transported to the construction site and further assembled into completed housing units. All interior and exterior walls, regardless of whether they are structural (load bearing) or not, are plant fabricated (panelized). Panels must be fabricated to the extent that the structure of the panel or truss is factory-assembled. Interior finishes; such as interior wallboard shall be site applied.

(3) Manufactured Housing: A manufactured home is "a structure, transportable in one (1) or more sections and when erected on site is built on a permanent foundation and has connected utilities, which includes the plumbing, heating, air conditioning and electrical systems contained therein." *Note a trailer style rectangular shape (approx. 40- feet in length by 8-16 foot in width) is considered an undesirable structure for design and construction under this contract.*

b) Design Quality Objective: The objectives are to obtain housing structures and complimentary site development within the funds available and to optimize livability. Design quality is achieved through the optimization of interior planning, integration of housing structures to the site, and balancing architectural attractiveness, variety, function, and design for low-cost maintenance and operation.

(1) Items included by the Offeror which exceed the RFP minimum requirements will affect positively the rating of the presentation. Items submitted in the successful Offeror's initial proposal shall not be substituted for without written acceptance by the Contracting Officer. Items, if substituted, must in all cases maintain, match or exceed the standards set forth in the RFP.

c) Ellsworth AFB Phasing and Future Plan: See Attachment No. 4 for excerpts of Task Order No. 1 and future Funding Year proposed site layouts.

d) Ecological Benefits: Offerors are encouraged to consider products and materials, which will afford initial and/or long-range reductions in the consumption of water, fuels, electrical power, raw materials, or accumulation of waste matter. The Air Force continues to emphasize environmental quality and conservation of energy and resources.

e) Energy and Resources Conserving Features: Public Law 102-486, Executive Order 12902, and Federal Regulations 10 CFR 435, require Federal buildings to be designed and constructed to reduce energy consumption in a life-cycle, cost-effective manner using renewable energy sources when economical. Products designed to conserve energy and resources by controlling the amounts of consumed energy or by operating at increased efficiencies shall be considered. Minimum requirements for this project are high-efficiency central heating and air conditioning units, energy efficient roof design and systems, energy efficient appliances, energy efficient water heater, water flow-limiting plumbing fixtures, and double-glazing for all glazed openings.

f) Prototype Housing Units: The purpose of the prototype-housing unit is to verify the details of the approved design and material selections, and to establish the quality level against which the remaining work will be judged. At the plant, or at the site, construction connection details shall be exposed for study by authorized Government inspectors for a period of time agreed to by the Contractor and the Contracting Officer. The housing unit or units at the plant and/or the prototype at the site are subject to Contracting Officer's approval. At the site, the prototype shall be constructed in segments for inspection for each housing unit type up to completion. Each stage of work shall be completed and accepted on the prototype, prior to starting work on the same stage for similar housing units in the project. See Section 00800 for typical items of inspection and approval.

(1) "Site-Built": A prototype-housing unit shall be required for each housing unit type.

(2) "Manufactured" or "Factory-Built": A prototype-housing unit shall be required for each housing unit type of each run fabricated at the plant for manufactured or factory-built homes.

g) Manufactured: If the housing units are classified as manufactured housing, all interior and exterior systems which form integral parts of the transportable module shall be constructed and assembled for inspection by the Government. This shall include, as a minimum, wall and ceiling construction, interior finishes, utility piping, wiring, and ductwork fastening and assembling of adjacent modules, connection details to sinks, installed kitchen cabinets and countertops. Portions of the work shall be left unfinished or exposed to demonstrate interior construction details.

h) Factory-Built: If the housing units are classified as factory-built housing, all wall panels which are fabricated in the plant for shipment to the site shall have prototype units constructed and assembled for in-plant inspection by the Government. This shall include, as a minimum, wall framing, roof and ceiling framing, connection details, utility piping, wiring and ductwork, interior and exterior wall finishes which form part of the factory-built wall. In addition, the Contractor shall construct as part of the factory-built prototype, installed samples of wall insulation, finished siding (if not part of wall assembly), sample installed bathtub and sink and

installed kitchen sink and cabinets to demonstrate proper installation and wall connections. Portions of the work shall be left unfinished or exposed to demonstrate interior construction details.

i) One-Floor-Prototype: If only one floor of the prototype is manufactured or factory-built, factory assembly of the manufactured or factory-built portion of the prototype is required. In all cases, the factory prototype shall consist of one of each building type. The factory prototype shall be assembled to verify assembly connections, details, construction, and transportation of the finished housing unit.

j) Structural Integrity: Manufactured and factory-built homes shall be of individual housing units attached to one another in a manner which shall provide a finished structural assembly having an appearance and structural integrity comparable to a site-built single or multi-family residence built to applicable codes.

k) Construction Tolerances: Assembled housing units shall be true and plumb and all within specified construction tolerances for all alignments represented on the drawings. Adjacent walls shall be attached at roof and floor levels in such a manner as to preclude placing any wood member in cross-grain bending or cross-grain tension, and to avoid putting nails in withdrawal.

1.2.6.2 Betterments

Within this section of the RFP, the Government has identified certain ***Betterments***, which are beyond the minimum criteria requirements given for family housing. Proposers are encourged to provide as many of these features to the extent they can be provided within the funds available (DCCL) for the award of this project (See Section 00110 for additional information on Betterments). A list of Betterments in descending order of priority is indicated below. See PARTS 4 through 14 for additional reference and requirements on Betterments. ***Note: The Base desires to achieve units containing maximum square footage within the DCCL. Betterments should be considered throughout, however, unit square footage should be given the highest priority.***

a) Ceiling Fans, all Bedrooms
b) Combination Microwave/Range Exhaust Fans
c) Double Lavatories for the Master Bathroom
d) Design Elements that add to the functionality and aesthetics of the living units (Decorative Moldings, Built-in Desks, Window Seats, Extra Shelving , etc.)
e) Sidelights at the Main Entrance Doors
f) Solid Surface Countertops
g) Additional Housing Unit Landscape
h) Aluminum Clad or Vinyl Clad Wood Window Frames
i) High Pressure Laminated Plastic, Solid Surface Countertops w/ Backsplashes for Kitchen and Bathrooms
j) Vaulted Ceilings

1.3 DESIGN

After contract award and upon receipt of Notice to Proceed, the Contractor shall prepare detailed project design documents in accordance with SECTION 01332, DESIGN SUBMITTALS. The submittal shall be suitable to adequately demonstrate the design, materials and methods of construction in accordance with the contract.

1.4 EXAMPLES/QUALITY

Building systems, materials, and methods specified herein are defined as the minimum salient features desired and preferred for a level of quality, standards and compatibility throughout. Any appropriate building systems, operational equipment, materials, and methods that meet or exceed the standards and compatibility requirements set forth in the RFP may be proposed by the Design/Build Team. These shall be clearly specified within the proposal as “betterments” on the CONSTRUCTION MATERIALS, PRODUCTS, EQUIPMENT, AND SYSTEMS work sheets attached to SECTION 00110, PROPOSAL SUBMISSION AND EVALUATION.

1.5 PRAIRIE STYLE HOUSES

The general character of the neighborhood desired by Ellsworth AFB is a series of “Prairie Style” houses reminiscent of those designed by Frank Lloyd Wright and contemporaries of his. This is a style, which has had constant adaptation through today in various places throughout the country. It is also consistent with projects built at the base recently and is a natural choice for the prairie landscape of the region.

Design features characteristic of this style include, low-sloped hipped roofs, unbroken roof planes, deep overhanging eaves, dramatic horizontal lines, geometric detailing, low proportions, rows of casement windows, small high windows for indirect lighting, one-story projections, a raised central block or anchor, integrated terraces or balconies, flanking wings and a chimney at intersection of roof planes (fireplaces are prohibited). In addition to this the interior floor plans should be spacious, efficient, clean and open. Light fixtures and other exterior/interior design elements shall also reinforce the design relationship of the “Prairie Style". Material features, which depending on the design utilized, that are consistent with the "Prairie Style" Architectural scheme include, but are not limited to wood trim or sided with horizontal board and batten trim. Color schemes, through the use of contrasting bands or strips, shall also be utilized to further emphasis the “Prairie Style” Architectural Design scheme that is desired be Ellsworth AFB.

The design for the new housing units and there site layout should also strive to achieve some design compatibility with the new facilities at Ellsworth AFB that have also utilized the "Prairie Style" Architecture scheme in there design. It is hoped by doing so, that the base can begin to achieve a sense of unity in its facility design.

The photos are provide to illustrate various exterior design features that Ellsworth AFB feels are consistent with “Prairie Style” Architecture. The design of the new housing units should try to incorporate some of these ideas, so that they can achieve some design compatibility with the other “Prairie Style” designed facilities on Ellsworth AFB that the base is wishing to emulate on a larger scale throughout the base now and into the future. The illustrations do not intend to imply acceptance of any one particular unit design or materials. It is mainly the basic design aesthetics of “Prairie Style” Architecture that the illustrations are trying to convey.

For examples of what is considered "Prairie Style" Design see attached photos on the following pages:

Photos 1 through 5 illustrate features of “Prairie Style” Architecture as currently seen on Ellsworth AFB.

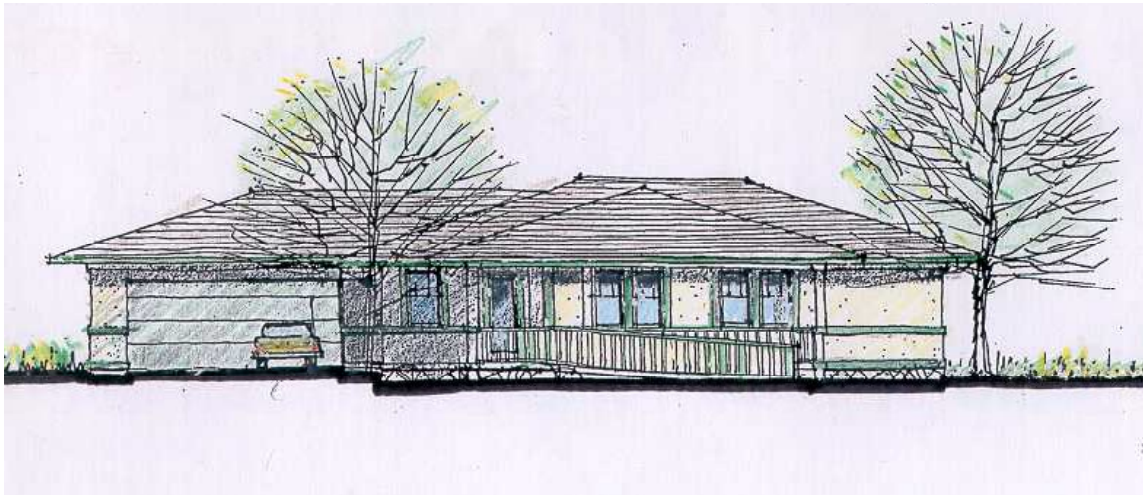
A1.jpg

A2.jpg

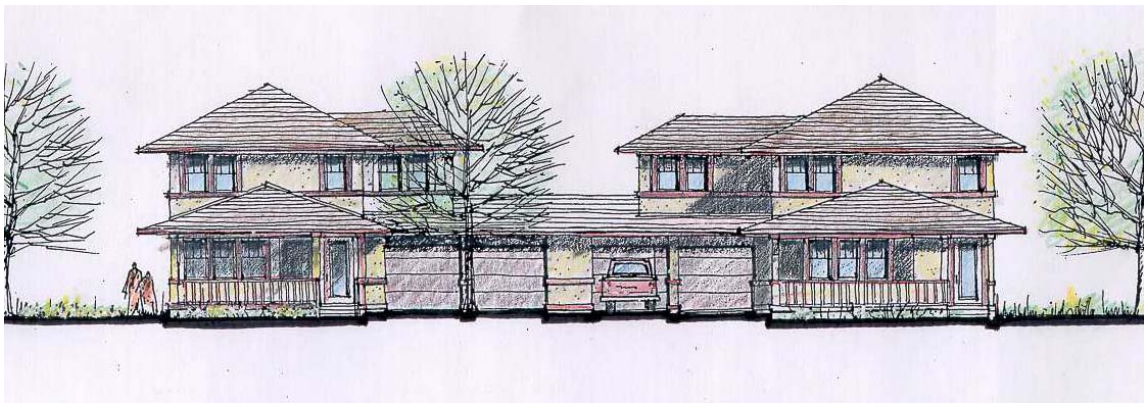
A3.jpg

Photos 4 and 7 illustrate residential designs of Ellsworth AFB's "Prairie Style" Architecture.

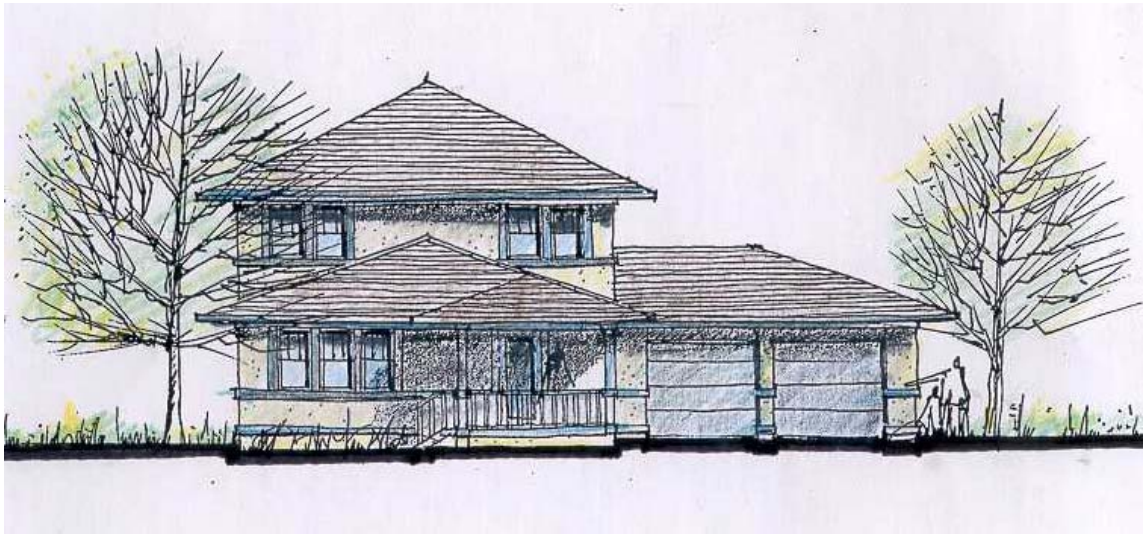
A4.jpg



A5.jpg



A6.jpg



A7.jpg

PART 2 – CRITERIA REFERENCES

INDEX

2 CRITERIA REFERENCES

Criteria to be used for design and construction shall be taken from the most current references at the date of issue of the RFP. Administrative, contractual, and procedural features of the contract shall be as described in other sections of the RFP. Referenced codes and standards herein and those listed below are minimum acceptable criteria.

2.1 HUD STANDARDS

The following specifications, standards, bulletins, and handbooks form a part of this document to the extent specified herein. Unless otherwise indicated, copies are available at the following Web Site: http://www.hudclips.org/sub_nonhud/cgi/hudclips.cgi

HUD MPS 4940.2	Water Supply
HUD MPS 4940.3	Sanitary Sewer
HUD 72A	Material Bulletin Building Product Standard and Certification Program for Carpet Cushion

2.2 FEDERAL LAWS

The Federal laws and regulations listed in Table 2-1 form a part of this document. They are available from the Superintendent of Documents, Government Printing Office, Washington, DC 20402-9325 (202) 783-3238.

TABLE 2-1 - FEDERAL LAWS & REGULATIONS

CFR/USC No.	Description
P.L. 102-486	**Energy Policy Act of 1992**
10 CFR 430	**National Appliance Energy Conservation Act (NAECA)**
10 CFR 435	**Voluntary Performance Standards for New Commercial and Multi-Family High Rise Residential Buildings; Mandatory for Federal Buildings.**
10 CFR 436	**Methodology and Procedures for Life Cycle Cost Analyses**
16 CFR 1630	**Standard for Surface Flammability of Carpet and Rugs**
49 CFR 192	**Transportation of Natural Gas and Other Gas by Pipeline: Minimum Federal Safety Standards**
42 USC 4901-4918 & 49 USC 1431	**Noise Control Act of 1972**

TABLE 2-1 - FEDERAL LAWS & REGULATIONS	
CFR/USC No.	**Description**
42 USC 5401-5426	**Federal Manufactured Housing Construction and Safety Standards Act of 1974**
Army Regulation 200-1	**Environmental Protection and Enhancement, May 1990**
E.O. 12902	**Energy Efficiency and Water Conservation in Federal Facilities**

2.3 FEDERAL HANDBOOKS AND STANDARDS

The specifications listed form a part of this document to the extent specified herein. Federal Standard 795, Uniform Federal Accessibility Standards, and federal specifications are available from the Commanding Officer, Naval Publications and Forms Center, ATTENTION: NPODS, 5801 Tabor Avenue, Philadelphia, PA 19120-5099.

a) HANDBOOKS

AFI	Air Force Instruction 32-6002, Family Housing Planning, Programming, Design, and Construction, 12 May 1994.
AFFHG	Air Force Family Housing Guide, December 1995. Supplement to AFI 32-6002.

b) STANDARDS

FED-STD-795	Uniform Federal Accessibility Standards.
ADAAG	Americans with Disabilities Act Accessibility Guidelines.

ACC Standards (May 2000) ACC Architectural and Interior Design Standards

2.4 ADDITIONAL GOVERNMENT DOCUMENTS AND PUBLICATIONS

The following Government documents and publications form a part of this document to the extent specified herein:

a) NBS Handbook 135, Life-Cycle Costing Manual for the Federal Energy Management Program. Available from the National Institute of Science and Technology, formerly National Bureau of Standards (NBS).

b) The following United States Environmental Protection Agency criteria are available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, (703) 487-4650: EPA/600/8-88/087, Radon-Resistant Residential New Construction; EPA/625/5-88/024, Application of Radon Reduction Methods; and EPA/625/5-87/019, Radon Reduction Techniques for Detached Houses.

c) DEPARTMENT OF COMMERCE (DOC)

FF-1-70 Pill Test

d) FEDERAL SPECIFICATIONS (FS)

FS AA-V-00200 Venetian Blinds

2.5 NON-GOVERNMENT PUBLICATIONS

The following publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are Department of Defense (DoD) adopted are those listed in the Department of Defense Index of Specifications and Standards (DODISS).

a) Air-Conditioning and Refrigeration Institute (ARI). Information listed below is available from ARI, 1501 Wilson Boulevard, Suite 600, Arlington, VA 22209, (703) 524-8800: (Unnumbered), Directory of Certified Unitary Air Conditioners, Unitary Heat Pumps and Sound Rated Outdoor Unitary Equipment; ARI 210/240, Unitary Air Conditioning and Air-Source Heat Pump Equipment.

b) Air Movement and Control Association, Inc. (AMCA). AMCA 210, Laboratory Methods of Testing Fans For Rating, is available from AMCA, 30 West University Drive, Arlington Heights, IL 60004, (312) 394-0150.

c) Home Ventilating Institute (HVI): a Division of AMCA. Copies of HVI publications are available at the following Web Site: http://www.lakehurst.com/hvihome.html or at (847) 394-0150.

d) American Architectural Manufacturers Association (AAMA). AAMA specifications shown in Table 2-2 are available from AAMA, 2700 River Road, Suite 118, Des Plaines, IL 60018, (312) 699-7310.

TABLE 2-2 – AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION SPECIFICATIONS

No.	Description
AAMA 101	**Voluntary Specification for Aluminum Prime Windows and Sliding Glass Doors**
AAMA 101V	**Voluntary Specification for Poly (Vinyl Chloride) (PVC) Prime Windows and Sliding Glass Doors**
AAMA 1002.10	**Voluntary Specifications for Aluminum Insulating Storm Products for Windows and Sliding Glass Doors**
AAMA 1402	**Standard Specifications for Aluminum Siding, Soffit, and Fascia**

e) (American Gas Association (AGA). Standards and specifications are available from AGA, 1515 Wilson Boulevard, Arlington, VA 22209, (703) 841-8400.

f) American National Standards Institute, Inc. (ANSI). Copies of the standards listed in Table 2-3 are available from ANSI, 1430 Broadway, New York, NY 10018, (212) 354-3300.

TABLE 2-3 - AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) STANDARDS	
Std. No.	**Std. Description**
A112.19.1	**Enameled Cast Iron Plumbing Fixtures**
A112.19.2	**Vitreous China Plumbing Fixtures**
A112.19.3	**Stainless Steel Plumbing Fixtures (Designed for Residential Use)**
A112.19.4	**Porcelain Enameled Formed Steel Plumbing Fixtures**
A112.19.5	**Trim for Water-Closet Bowls, Tanks, and Urinals (Dimensional Standards) (DoD Adopted)**
A161.1	**Recommended Construction and Performance Standards for Kitchen and Vanity Cabinets**
B16.5	**Steel Pipe Flanges and Flanged Fittings**
B16.22	**Wrought Copper and Copper Alloy Solder Joint Pressure Fittings (DoD Adopted)**
B16.26	**Cast Copper Alloy Fittings for Flared Copper Tubes**
B31.8	**Gas Transmission and Distribution Piping Systems**
C2	**National Electrical Safety Code**
ANSI C105 AWWA A21.5	**Polyethylene Encasement for Ductile-Iron Pipe Systems**
ANSI A137.1	**Ceramic Tile**
Z21.10.1	**Water Heaters, Gas, Volume I, Storage Type, 75,000 BTUH Input or Less**
Z21.45	**Flexible Connectors of Other Than All-Metal Construction for Gas Appliances**
Z60.1	**American Standard for Nursery Stock**
Z124.2	**Plastic Shower Receptors and Shower Stalls**

g) American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) documents, listed in Table 2-4, are available from ASHRAE, 1791 Tullie Circle, N.E., Atlanta, GA 30329, (404) 636-8400.

TABLE 2-4 - AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR-CONDITIONING ENGINEERS (ASHRAE)	
No.	**Description**
ASHRAE -	**Handbook of Fundamentals**
ASHRAE 52.1	**Method of Testing Air Cleaning Devices used in General Ventilation for Removing Particulate Matter**
ASHRAE 111	**Practices for Measurement, Testing, Adjusting, and Balancing of Building Heating, Ventilation, Air Conditioning, and Refrigeration Systems**

h) American Society of Mechanical Engineers (ASME). ASME B16.11, Forged Fittings, Socket-Welding and Threaded is available from ASME, 345 East 47th Street, New York, NY 10017, (212) 705-7722.

i) American Society of Sanitary Engineers (ASSE). ASSE 1006, Residential Use (Household) Dishwashers, and ASSE 1008, Food Waste Disposal Units, Household, are available from ASSE, P.O. Box 40362, Bay Village, OH 44140.

j) American Society for Testing and Materials (ASTM). ASTM specifications listed in Table 2-5 are available from ASTM, 1916 Race Street, Philadelphia, PA 19103, (215) 299-5400.

TABLE 2-5 - AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) SPECIFICATIONS	
Spec. No.	**Spec. Description**
A526	**Specification for Steel Sheet Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality (DoD Adopted)**
B117	**Method of Salt Spray (Fog) Testing (DoD Adopted)**
D 1335	**Tuft Bind of Pile Floor Coverings Room Method**
E 648	**Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source**
F 1066	**Vinyl Composition Floor Tile**
F 1303	**Sheet Vinyl Floor Covering with Backing**

TABLE 2-5 – AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) SPECIFICATIONS	
Spec. No.	**Spec. Description**
D3676	**Rubber Cellular Cushion Used for Carpet or Rug Underlay**
D1557	**Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft 2700kN-m/m)**
D1785	**Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120 (DoD Adopted)**
D2513	**Standard Specification for Thermoplastic Gas Pressure Piping (DoD Adopted)**
D2683	**Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing (DoD Adopted)**
D2846	**Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot and Cold-Water Distribution Systems (DoD Adopted)**
D3018	**Specification for Class A Asphalt Shingles Surfaced with Mineral Granules (DoD Adopted)**
E84	**Standard Test Method for Surface Burning Characteristics of Building Materials (DoD Adopted)**
E90	**Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions (DoD Adopted))**
E108	**Standard Methods of Fire Tests of Roof Coverings**
E119	**Standard Methods of Fire Tests of Building Construction and Materials**
E162	**Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source (DoD Adopted)**
E283	**Standard Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors**
E330	**Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference**
E336	**Standard Test Method for Measurement of Airborne Sound Insulation in Buildings**
E547	**Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential**
E648	**Critical Radiant Flux of Floor-Covering Systems Using a Radiant Energy Source**

TABLE 2-5 - AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) SPECIFICATIONS	
Spec. No.	**Spec. Description**
E779	**Measuring Air Leakage by the Pressurization Method**
E1007	**Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures**
E1465	**Standard Guide for Radon Control Options for the Design and Construction of New Low-Rise Residential Buildings**
F1292	**Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment**
E1423	**Standard Practice for Determining the Steady State Thermal Transmittance of Fenestration Systems**
F1487-93	**Standard Consumer Safety Performance Specification for Playground Equipment for Public Use**
G90	**Standard Practice for Performing Accelerated Outdoor Weathering of Nonmetallic Materials Using Concentrated Natural Sunlight**

k) American Water Works Association, Inc. (AWWA). Specifications listed below are available from AWWA, 6666 Quincy Ave., Denver, CO 80235, (303) 794-7711: AWWA C500, Gate Valves for Water and Sewerage Systems (DoD adopted); AWWA C502, Dry-Barrel Fire Hydrants; and AWWA C503, Wet-Barrel Fire Hydrants.

l) Associated Air Balance Council (AABC). AABC MN-1, National Standards for Total System Balance, is available from AABC, 1518 K Street N.W., Washington, DC 20005.

m) Association of Textile Chemists and Colorists (AATCC). AATCC 134, Electrostatic Propensity of Carpets, is available from AATCC, P.O. Box 12215, Research Triangle Park, NC 27709, (919) 549-8141.

n) Builders Hardware Manufacturers Association, Inc. (BHMA). Specifications shown in Table 2-6 are available from the Builders Hardware Manufacturers Association, Inc. (BHMA), 60 East 42nd Street, Room 511, New York, NY 10165, (212) 661-4261.

TABLE 2-6 - BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA) SPECIFICATIONS	
No.	**Description**
BHMA 101	**Butts and Hinges**
BHMA 301	**Door Controls, Closers**
BHMA 501	**Auxiliary Locks and Associated Products**
BHMA 601	**Bored and Preassembled Locks and Latches**
BHMA 611	**Interconnected Locks and Latches**
BHMA A156-5	**Interchangeable Cores**

o) Council of American Building Officials (CABO). The CABO One (1) and Two (2) Family Dwelling Code and Model Energy Code, are available from The Council of American Building Officials, 5203 Leesburg Pike, Falls Church, VA 22041.

p) Electronic Industries Association Telecommunications Industry Association (EIA/TIA). EIA/TIA Standard EIA/TIA-570, is available from Electronic Industries Association, Engineering Department, 2001 Pennsylvania Ave., N.W., Washington, DC 20006. Telephone: (202) 457-4966.

q) Illuminating Engineering Society of North America (IESNA). The IESNA Lighting Handbook, is available from Illuminating Engineering Society of North America, 345 East 47th Street, New York, NY 10017.

r) International Association of Plumbing and Mechanical Officials (IAMPO). The Uniform Plumbing Code and Uniform Mechanical Code is available from the International Association of Plumbing and Mechanical Officials (IAMPO) 5032 Alhambra Avenue, Los Angeles, CA 90032 / (213 223-1471).

s) International Code Council (ICC). International Building Code (2000). Available from The International Conference of Building Officials (ICBO), 5360 Workman Mill Road, Whittier, CA 90601-2298 / (800) 284-4406

t) International Code Council (ICC). International Residential Code for One- and Two- Family Dwellings (2000). Available from The International Conference of Building Officials (ICBO), 5360 Workman Mill Road, Whittier, CA 90601-2298 / (800) 284-4406

u) National Association of Architectural Metal Manufacturers Association (NAAMA). NAAMA Metal Finishes Manual, is available from the National Association of Architectural Metal Manufacturers Association (NAAMA), 600 South Federal Street, Chicago, IL 60605-1842, (312) 922-6222.

v) National Association of Corrosion Engineers (NACE). NACE RP-0286, The Electrical Isolation of Cathodically Protected Pipelines, is available from NACE, P.O. Box 218340, Houston, TX 77218.

w) National Association of Corrosion Engineers (NACE). NACE RP-0169, Control of External Corrosion on Underground or Submerged Metallic Piping Systems, is available from NACE, P.O. Box 218340, Houston, TX 77218.

x) National Association of Plumbing-Heating-Cooling Contractors (PHCC). The National Standard Plumbing Code is available from National Association of Plumbing-Heating-Cooling Contractors (PHCC), P.O. Box 6808, Falls Church, VA 22046-1148, 1-800-253-4491.

y) National Electrical Manufacturers Association (NEMA). NEMA standards listed below are available from the National Electrical Manufacturers Association (NEMA), 2101 L Street, N.W., Washington, DC 20037, (202) 457-8400: NEMA DC 3, Wall-Mounted Room Thermostats; and NEMA WD 1, General Requirements for Wiring Devices.

z) National Environmental Balancing Bureau (NEBB). NEBB-01, Procedural Standards for Testing-Adjusting-Balancing of Environmental Systems, is available from NEBB, 1385 Picard Drive, Rockville, MD 20850, (301) 977-3698.

aa) National Fenestration Rating Council (NFRC). NFRC 100-91, Procedure for Determining Fenestration Product Thermal Properties, is available from NFRC, 1300 Spring Street, Suite 120, Silver Spring, MD. Telephone: (301) 589-NFRC.

bb) National Fire Protection Association, Inc. (NFPA). NFPA codes listed in Table 2-7 are available from the National Fire Protection Association, Inc. (NFPA), Battery March Park, Quincy, MA 02269. Telephone: (617) 770-3000.

TABLE 2-7 - NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CODES

Code No.	Code Description
NFPA 13R	**Installation of Sprinkler Systems in Residential Occupancies Up To and Including Four Stories**
NFPA 54	**National Fuel Gas Code**
NFPA 70	**National Electrical Code (State Adopted)**
NFPA 72	**National Fire Alarm Code**
NFPA 101	**Life Safety Code**
NFPA 101M	**Alternative Approaches to Life Safety**
NFPA 255	**Method of Test of Surface Burning Characteristics of Building Materials**
NFPA 501A	**Manufactured Home Installations**
NFPA 701	**Standard Methods of Fire Tests for Flame Resistant Textiles and Films**

cc) National Sanitation Foundation, 3475 Plymouth Road, P.O. Box 1468, Ann Arbor, MI 48106. Telephone: (313) 769-8010.

dd) National Wood Window and Door Association (NWWDA) standard, NWWDA I.S.2, Standard for Wood Window Units is available from the National Wood Window and Door Association (NWWDA), 205 Touhy Ave., Des Plaines, IL 60018, (312) 299-5200.

ee) Sheet Metal and Air Conditioning Contractors National Association (SMACNA). SMACNA Installation Standards for Residential Heating and Air Conditioning Systems and SMACNA-07, HVAC Systems, Testing, Adjusting, and Balancing, are available from SMACNA, 8224 Old Courthouse Road, Tysons Corner, Vienna, VA 22180.

ff) Underwriter's Laboratories, Inc. (UL) specifications listed in Table 2-8 are available from the Underwriters Laboratories, Inc. (UL), 333 Pfingston Road, Northbrook, IL 60062. Telephone: (312) 272-8800.

TABLE 2-8 - UNDERWRITERS LABORATORIES SPECIFICATIONS

No.	Description (Specs. are DoD Adopted)
UL 430	**Waste Disposers**
UL 507	**Electric Fans**
UL 555	**Fire Dampers**
UL 749	**Household Dishwashers**
UL 858	**Household Electric Ranges**
UL 900	**Test Performance of Air Filter Units**

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PART 3 – SUSTAINABLE DESIGN CONSIDERATIONS

INDEX

3 SUSTAINABLE DESIGN CONSIDERATIONS

3.1 GOALS AND OBJECTIVES

Sustainable design techniques shall be considered as they relate to site design, site engineering, unit design and the unit engineering. Techniques, which conserve energy, improve livability and can be justified by life cycle cost analysis, as cost effective, are encouraged. Integration of energy conservation systems with the housing unit's design (i.e., lighting, structure, mechanical systems, and aesthetics) is essential to facilitate livability and maximum energy savings. The paragraphs that follow define goals and general objectives for inclusion and achievement of sustainable design considerations for this project. This information is based on the U.S. Army Corps of Engineers (USACE), ETL 1110-3-491. For additional guidance on sustainable design see referenced websites below.

The overall USACE goal of sustainable design is to be environmentally responsible in the delivery of facilities. The key traditional elements for decision making in the facility delivery process are cost quality and time. These elements need to be expanded to include the ecological and human health impacts of all decisions.

Each project generates it's own set of goals. However, sustainable design should apply to all projects. The goals for improving the environmental performance of facilities includes: (a) use resources efficiently and minimize raw material resource consumption, including energy, water, land and materials, both during the construction process and throughout the life of the facility; (b) maximize resource reuse while maintaining financial stewardship; (c) move away from use of fossil fuels and move towards renewable energy resources; (d) create a healthy and productive work environment for all who use the facility; (e) build facilities of long-term value; and (f) protect, and where appropriate, restore the natural environment.

3.1.1 SUSTAINABLE DESIGN AND CONSTRUCTION OF THE BUILT ENVIRONMENT

Design and construction of sustainable facilities should be in accordance with the following concepts:

a) Site Work and Planning: Environmentally sensitive planning looks beyond the boundary of the project site to evaluate linkages to transportation and infrastructure, ecosystems and wildlife habitat and community identification. Site planning evaluates solar and wind orientation, local microclimate, drainage patterns, utilities and existing site features to develop optimal siting and appropriate low maintenance landscape plant material.

b) Building Layout and Design: Optimize building size and maintains an appropriate building scale for the environment and context of the building or a building component. Layout the rooms for energy performance and comfort and design for standard size materials to minimize material waste. Pay careful attention to exterior window locations. Avoid structural over-design and its resultant waste. Design components of the built environment for durability and ease of adaptation to other uses and for proper waste recycling.

c) Energy: Building orientation and massing, natural ventilation, day lighting, shading and other passive strategies, can all lower a building's energy demand and increase the quality of the interior environment and the comfort and productivity of the occupants.

d) Building Materials: Environmentally preferable building materials are durable and low maintenance. Within the parameters of performance, cost, aesthetics and availability, careful selection and specification can limit impacts on the environment and occupants health.

e) Indoor Air Quality (IAQ): Indoor air quality is most effectively controlled through close coordination of architecture, interiors and MEP design strategies that limit sources of contamination before they enter the building. Construction procedures for IAQ and post-occupancy user guides also contribute to a good long-term IAQ.

f) Water: Site design strategies that maximize natural filtration of rainwater are considered advantageous. Water conservation is enhanced by, low flow plumbing fixtures, water appropriate landscaping and HVAC and plumbing system design.

g) Recycling and Waste Management: Waste and inefficiency can be limited during construction by sorting and recycling demolition and construction waste, reuse of on-site materials and monitoring of material use and packaging. Accommodating recycling into building design reduces waste while generating revenues.

h) Building Commissioning, Operations and Management: Effective building commissioning is essential to ensure proper and efficient functioning of systems. Facilities operations benefit from the monitoring of indoor air quality and energy, water saving practices, waste reduction, and environmentally sensitive maintenance and procurement policies.

3.2 RELATABLE REFERENCES AND WEBSITES

3.2.1 RELATED REFERENCES

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

3.2.2 WEB SITES TO CONSIDER FOR SUSTAINABLE DESIGN

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 - Environmental 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

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PART 4 – SITE

INDEX

ATTACHMENT: Typical Party Wall Detail

4 SITE

4.1 REFERENCE

4.1.1 DEPARTMENT OF THE AIR FORCE TECHNICAL MANUALS (AFM)

AFM 88-7, Chap. 1 (June 92) Pavement Design for Roads, Streets Walks, and Open Storage Areas

4.1.2 AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM)

ASTM D 977 (1998) Emulsified Asphalt

ASTM D 2027 (1976; R 1997) Cutback Asphalt (Medium-Curing Type)

ASTM D 2397 (1998) Cationic Emulsified Asphalt

ASTM F 1292 (1999) Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment

ASTM F 1487 (2001) Standard Consumer Safety Performance Specification for Playground Equipment for Public Use

4.1.3 HANDICAPPED ACCESSIBILITY STANDARDS

ADAAG (Jan 1998) Accessibility Guidelines for Buildings and Facilities

4.1.4 ENGINEERING MANUALS (EM)

EM 1110-1-1002 Survey Markers and Monumentations (14 Sep 90)

4.1.5 U.S. DEPARTMENT OF TRANSPORTATION (DOT)

DOT D-6.1 (2000) Uniform Traffic Control Devices for Streets and Highways

4.1.6 AIR FORCE FAMILY HOUSING GUIDE

4.1.7 U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FED STD 795 (Basic) Uniform Federal Accessibility Standards

4.2 SITE DEMOLITION

4.2.1 GENERAL SITE DEMOLITION

The Contractor shall remove designated pavement, curb and gutter, driveways, fences, utilities, signs, sidewalks, trees, footings, bus shelters, masonry trashcan enclosures, and structures as required to construct the new family housing units. Some of the existing chainlink fence identified on the RFP drawings may be gone prior to turning the site over to the Contractor. All existing features to remain shall be protected during the demolition and construction process. All materials shall be disposed of outside the limits of Government controlled lands. Disposals shall be 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. Rubbish and debris shall be removed from Government property daily to avoid accumulation at the project site. Demolition shall be specified in UFGS Specification Section 02220A DEMOLITION. An unedited copy of Section 02220A is included at the end of RFP, Attachment 3. **The Demolition Plans provided in the RFP are to be considered as preliminary and are provided as information to assist the Contractor in preparing his proposal. Any errors identified shall be brought to the attention of the Contracting Officer immediately for resolution and direction. The Design Build Contractor shall provide final Demolition Plans as part of the design package.**

4.2.2 GENERAL UTILITY AND STORM DRAIN REMOVALS

See Section 01000, PART 8 - SITE UTILITIES; PART 6 - GRADING, DRAINAGE, AND EROSION CONTROL; and the RFP drawings for specific information on removal of utilities and storm drains.

4.2.3 GENERAL BUILDING DEMOLITION

Building demolition shall include the complete housing unit including foundations and all existing equipment and appliances. No Government salvage of any building components, equipment or appliances is planned. Existing trees and plantings within the housing area are to be preserved to the extent possible. All materials, **except excavated and waste soil**, shall be disposed of outside the limits of Government controlled lands. Disposals shall be 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. Rubbish and debris shall be removed from Government property daily to avoid accumulation at the project site. Asbestos containing material has been identified on the existing housing units. See Attachment 2, Ellsworth AFB Asbestos and Lead-Based Paint Identification Survey for information. In addition, a typical party-wall detail is attached to Part 4, herein, which indicates a firestop location thought to contain asbestos.

4.2.4 TASK ORDER NO. 1, FY 04, PHASE 3. HOUSING UNITS TO BE DEMOLISHED.

The FY04, Phase 3 work will require the demolition of 80 existing family housing units (40 duplexes). See RFP drawings for building locations and for typical floor plans of A2 and A3 duplexes. Photos have been included below:

Jefferson Drive

Address	Type	Building Color	Driveway Material	Yard Fencing
9654A	A3	Lt. Green	Asphalt	4' Chain-Link
9654B	A3	Lt. Green	Asphalt	4' Chain-Link
9656A	A3	Yellow	Asphalt	4' Chain-Link
9656B	A3	Yellow	Asphalt	
9657A	A2	Lt. Green	Asphalt	
9657B	A2	Lt. Green	Concrete	
9658A	A2	Cream	Asphalt	
9658B	A2	Cream	Asphalt	
9659A	A3	White	Concrete	
9659B	A3	White	Asphalt	
9660A	A2	Brown	Asphalt	
9660B	A2	Brown	Concrete	
9661A	A3	Tan	Asphalt	4' Chain-Link
9661B	A3	Tan	Asphalt	
9662A	A3	Yellow	Concrete	

9662B	A3	Yellow	Asphalt	
9663A	A2	Lt. Green	Asphalt	

Jefferson Drive

Address	Type	Building Color	Driveway Material	Yard Fencing
9663B	A2	Lt. Green	Asphalt	
9664A	A2	Cream	Concrete	
9664B	A2	Cream	Concrete	4' Chain-Link
9665A	A3	White	Asphalt	
9665B	A3	White	Asphalt	4' Chain-Link
9666A	A2	Brown	Concrete	4' Chain-Link
9666B	A2	Brown	Asphalt	
9667A	A3	Tan	Asphalt	
9667B	A3	Tan	Asphalt	
9668A	A3	Yellow	Asphalt	
9668B	A3	Yellow	Asphalt	
9669A	A2	Lt. Green	Asphalt	
9669B	A2	Lt. Green	Asphalt	
9670A	A2	Cream	Concrete	
9670B	A2	Cream	Asphalt	4' Chain-Link
9671A	A2	White	Asphalt	4' Chain-Link
9671B	A2	White	Asphalt	
9672A	A2	White	Asphalt	
9672B	A2	White	Asphalt	14 Fence Posts
9673A	A3	Yellow	Asphalt	
9673B	A3	Yellow	Asphalt	
9674A	A3	Brown	Asphalt	
9674B	A3	Brown	Asphalt	4' Chain-Link
9675A	A2	Tan	Asphalt	
9675B	A2	Tan	Asphalt	

Cleveland

Address	Type	Building Color	Driveway Material	Yard Fencing
9676A	A3	Yellow	Asphalt	4' Chain-Link
9676B	A3	Yellow	Asphalt	
9677A	A2	Lt. Green	Asphalt	
9677B	A2	Lt. Green	Asphalt	
9678A	A2	Cream	Asphalt	
9678B	A2	Cream	Asphalt	
9679A	A2	White	Asphalt	
9679B	A2	White	Asphalt	
9680A	A3	Yellow	Asphalt	4' Chain-Link
9680B	A3	Yellow	Asphalt	
9681A	A3	Brown	Asphalt	
9681B	A3	Brown	Asphalt	

9682A	A2	Tan	Asphalt	
9682B	A2	Tan	Asphalt	

Cleveland

Address	Type	Building Color	Driveway Material	Yard Fencing
9683A	A2	Yellow	Asphalt	
9683B	A2	Yellow	Asphalt	
9684A	A2	Lt. Green	Asphalt	4' Chain-Link
9684B	A2	Lt. Green	Asphalt	4' Chain-Link
9685A	A3	Cream	Concrete	
9685B	A3	Cream	Asphalt	4' Chain-Link
9686A	A3	White	Asphalt	
9686B	A3	White	Asphalt	
9687A	A2	Yellow	Asphalt	
9687B	A2	Yellow	Asphalt	
9688A	A2	Brown	Asphalt	
9688B	A2	Brown	Asphalt	
9689A	A3	Tan	Asphalt	4' Chain-Link
9689B	A3	Tan	Asphalt	
9690A	A2	Yellow	Asphalt	
9690B	A2	Yellow	Asphalt	
9691A	A3	Lt. Green	Asphalt	
9691B	A3	Lt. Green	Asphalt	
9692A	A3	Cream	Asphalt	
9692B	A3	Cream	Asphalt	

Roosevelt Drive

Address	Type	Building Color	Driveway Material	Yard Fencing
9601A	A3	Lt. Green	Concrete & Asphalt	4' Chain-Link
9601B	A3	Lt. Green	Concrete & Asphalt	4' Chain-Link
9603A	A2	White	Concrete	
9603B	A2	White	Concrete & Asphalt	

Existing Housing
Type A2 Unit (Front View)

Existing Housing
Type A2 Unit (Rear View)

Existing Housing
Type A2 Unit (Side View)

Existing Housing
Type A2 Unit (Side View)

Existing Housing
Type A3 Unit (Front View)

Existing Housing
Type A3 Unit (Rear View)

Existing Housing
Type A3 Unit (End View)

Existing Housing
Type A3 Unit (End View)

Concrete Driveway

Asphalt Concrete (AS) Driveway

Concrete and AC Driveway

4.2.5 TASK ORDER NO. 1, FY 04, PHASE 3. PLAYGROUND REMOVALS.

Playground No. 1 will not be removed in Task Order No. 1. The Contract shall protect the playground when performing demolition activities in this area. The existing half-court basketball standard, backboard, goal, and net will be removed. Ellsworth AFB will remove the playground equipment from Playground No. 2 prior. See RFP drawings for playground locations.

4.2.6 TASK ORDER NO. 1, FY 04, PHASE 3. SITE REMOVALS.

All streets, sidewalks, curb and gutters will be removed throughout the Task Order No. 1 area. See RFP drawings for the limits of the site removals required for Task Order No. 1.

4.3 EXISTING SITE CONDITIONS

4.3.1 GOVERNMENT PROVIDED INFORMATION

The Contractor's design documents shall include street repair and replacement, new streets, street milling and overlay, curb and gutter removal and replacement, sidewalks, utility systems, street lights, grading, storm drainage, street signage, playgrounds, common areas, landscaping and other work as necessary to support a complete and fully functional military family housing complex as described in this RFP. **Government provided survey drawings are provided to assist the Contractor in preparing his proposal. Any errors identified shall be brought to the attention of the Contracting Officer immediately for resolution and direction. The Contractor shall take all professionally prudent and reasonable actions to verify the accuracy of the data provided. During design and construction, the Contractor shall be responsible for obtaining any additional data necessary for the execution of this project.**

4.3.2 ENGINEERING SURVEY

The Contractor shall use Government supplied survey data in the preparation of their proposal and design. Field survey data is available to the Contractor on CD-ROM furnished with this solicitation. CADD files

are in English units and AutoCAD 2000 format. The survey data information was gathered by a topographical survey performed in November 2002. Contours were gathered at 1-foot intervals. Below grade utility data was obtained from "best-available" as-built mapping.

4.3.2.1 Ground Control

The survey was developed using South Dakota State Plane Coordinate System South, English units in U.S. Survey Feet. The horizontal and vertical control reference datums were NAD 83 (1996) and NAVD 88 respectively. All data is at True State Plane at zero elevation. The design drawings shall be developed using the same vertical and horizontal datums as the engineering survey.

4.3.2.2 As-Built Conditions

The Contractor shall be responsible for surveying all new and relocated utilities for location and elevation prior to backfilling. Coordinates and elevations of all branch lines, changes in direction, valves, curb stops, fire hydrants, storm drainage and sanitary sewer structures, and any other utility structures shall be documented and provided to the Contracting Officer for inclusion into the Ellsworth AFB G.I.S. system.

4.4 SITE DESIGN

4.4.1 GENERAL

Imaginative site design is encouraged, however, the site boundaries and project composition are fixed. The scope shall be as indicated in this RFP and shall follow the guidance provided in the Air Force Family Housing Guide for neighborhood design. **All Task Order No. 1 housing units shall be sited within the given boundaries of the task order and as shown on the RFP drawings.** All site lay out shall be subject to approval by the Government. All new construction is located entirely within the limits of Government-controlled lands. The Contractor's design documents shall include street repairs, milling and overlay of streets, new pavement, curb and gutter removal and replacement, sidewalks, driveways, utility systems, street lights, grading, storm drainage, landscaping, recreation facilities, common areas, and other work as necessary to support a complete and fully functional military family housing complex. A major site-planning objective is to ensure an interesting, attractive, livable residential environment and to utilize the potential advantages of the site. Planning shall take into consideration topography, preservation of existing trees as is feasible, climatic conditions, and prevailing winds. Design should capitalize upon economics inherent in the natural character of the site, using existing terrain to minimize cut and fill, and consolidating utilities and common open spaces. Variety in groupings, arrangements, and site configurations of houses is encouraged to fit varying terrain conditions and to provide attractive residential patterns and streetscapes. Building arrangements should be informal and imaginative with setbacks and orientation to provide for the best view, privacy, and variety. The proper grouping of units will provide natural or inherent backyard screening, separation of pedestrian and vehicular traffic, and natural open spaces.

4.4.1.1 Separation and Grouping of Housing Units by Rank

The site layout needs to separate and group JENL and SNCO housing units into two distinct areas.

4.4.1.2 Land Use

Design plans shall reflect an optimum balance of housing unit floor area, open space, play areas, and pedestrian circulation. The design should show an efficient, organized and economical land use arrangement that is compatible and functional and demonstrates the relationship of the area to adjacent land uses. The goal is to have at least 20% of the site as open space, unless the amount of available land dictates otherwise.

4.4.1.3 Noise

Use site design techniques such as building location and orientation, window placement, and landscape barriers to moderate predictable undesirable noise. All possible methods of mitigating the impact to the site and adjacent areas should be explored.

4.4.1.4 Buffer Area

Provide appropriate buffer areas to separate and visually isolate the community from any undesirable external influences. The width of a street should be a minimum acceptable buffer zone. All possible methods of mitigating the impact to the site and adjacent areas should be explored

4.4.1.5 Housing Unit Setbacks and Spacing

Clearances between and adjacent to buildings must consider requirements for fire protection, safety, privacy, maintenance, and emergency access in addition to the following minimum criteria. Setback dimensions shall be from the building wall to an imaginary lot line around each building measured perpendicular to the building. Minimum setbacks are as follows:

a) Wall definitions.

1/ Wall A contains the housing unit main entrance; or the principal window(s) of the living room, dining room, or family room.

2/ Wall B contains window(s) other than in wall 'A.'

3/ Wall C contains no windows.

b) House setback (house to house = setback calculated x 2).

1/ Wall A: 6 ft + 2 ft for each level + 5 percent wall length.

2/ Wall B: 4 ft + 1 ft for each level + 5 percent wall length.

3/ Wall C: 7-1/2 ft minimum.

c) Nearest point of house to the back of curb can range between 28 and 36 feet. Garage cannot set ahead of living unit as viewed from the street.

4.4.2 CONTRACTORS ACCESS ROUTE

Contractor access route to the project location shall be as shown on the RFP drawings. Contractor shall be responsible for the necessary upgrade and maintenance of the access route. Only upon completion of all of the construction and upon the direction of the Contracting Officer will the access road alignment be returned to its original condition.

4.4.3 STAGING/STORAGE AREA

The location of the Contractor's staging and storage area shall be as shown on the RFP drawings. Contractors parking areas shall be located near the staging areas. Only upon completion of all of the construction and upon the direction of the Contracting Officer will the staging area be returned to its original condition.

4.4.4 CONTRACTORS STOCKPILE AREA

The Contractor shall use excess soil from excavation and grading operations to create landscape berms. **No soil shall leave Ellsworth AFB.** If there is still excess soil after the creation of berms, the soil shall be stockpiled at the area shown on the RFP drawings.

4.4.5 BORROW AND WASTE

Phase 1 and Phase 2 Replace Family Housing project has generated a stockpile of approximately 30,000 CY of material. The Contractor is encouraged to use this material in Task Order No. 1. It is the Contractors responsibility to make sure the material is suitable for its intended use. The Contractor is prohibited from using this stockpile material for any off base use. See RFP drawings for stockpile location and access. New FE-6 type chainlink security fence and gate shall be used to relocate the base perimeter around the borrow site. Only upon the direction of the Contracting Officer will the temporary fence and gates be removed and disposed of outside the limits of Government-controlled lands. Contractor shall be responsible for construction and maintenance of the access route into the borrow area. Only upon the direction of the Contracting Officer will the access road alignment be returned to its original condition. Any surplus materials not required for fill shall be used for berm construction. **No soil shall leave Ellsworth AFB.** If there is still excess soil after the creation of berms, the soil shall be stockpiled at the area shown on the RFP

If the Contractor chooses not use the Phase 1 and 2 stockpile for borrow, any additional borrow materials required 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. Any surplus materials not required for fill shall be used for berm construction. **No soil shall leave Ellsworth AFB.** If there is still excess soil after the creation of berms, the soil shall be stockpiled at the area shown on the RFP drawings.

4.4.6 TEMPORARY SECURITY FENCE

New FE-6 type chainlink security fence and gates shall be used to relocate the base perimeter around the construction site and for creating the secure area around the Phase 1 and 2 stockpile area. The fence and gate locations and details shall be as shown on the RFP drawings. The fence shall have a standard single outrigger with three strands of barbed wire on the outrigger. The fence fabric shall be 7 feet high with top rail and bottom wire. Chainlink fabric shall be either zinc or aluminum coated 9-gage wire woven in a 2 inch mesh. Tie wires shall be 9-gage galvanized steel wire. Chainlink fencing shall be specified in UFGS Specification SECTION 02821A FENCING. An unedited copy of Section 02821A is included at the end of RFP, Attachment 3. Where new utilities will be installed across existing fence lines using open trench methods, the existing fence shall be removed and replaced to match the original. Only upon completion of all of the construction and upon the direction of the Contracting Officer will the temporary fence and gates be removed and disposed of outside the limits of Government-controlled lands.

4.4.7 PROJECT SIGN

On commencement of work for Task Order No. 1 and subsequent task orders, 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 Omaha District Standard Drawing C-8.10, PROJECT SIGN DETAILS.

4.4.8 CURB AND GUTTER

New and replacement curb and gutter shall match existing and shall be made of concrete. Curbs shall be depressed at entrances to driveways and at all other areas where ramping for vehicular or pedestrian access is provided. Curb ramps shall be provided wherever an accessible route crosses a curb including intersections, pedestrian crossings, mailboxes, playgrounds, parks, and recreational areas. Accessibility

shall be considered for bike riders, strollers, and persons with disabilities. All gradients shall provide positive drainage (no ponding).

4.4.9 PAVEMENT REPAIR FOR UTILITY INSTALLATION

Where new utilities will be installed using open trench methods, existing pavements shall be removed as necessary to install the utility line. Concrete pavements shall be replaced to the original cross section. Cuts in asphalt pavements shall be filled with a slurry cement backfill to prevent settlement. The bituminous surface course shall match the original thickness. Bituminous surface course and concrete pavement shall overlap at least 12 inches over existing base courses.

4.4.10 GENERAL PAVEMENT MILLING AND OVERLAY

Existing streets shall be milled and overlayed **only to the extent shown on the RFP drawings**. When all other construction activities are complete, the existing street shall be milled 5 feet wide by 2 inches deep along each gutter line and then the **entire street** overlaid with 2 inches of asphalt-concrete.

4.4.10.1 Task Order No. 1, FY 04, Phase 3. Pavement Milling and Overlay

No existing streets will be milled and overlayed as part of Task Order No.1.

4.4.11 NEW OR REPLACED STREETS

The width of any new or replaced streets shall be in accordance with the Air Force Family Housing Guide and shall have a conventional asphalt pavement section with concrete curb and gutter. Provide a minimum curb radius at intersections of 20-ft. Curb and gutter shall match existing. Curbs shall be depressed at entrances to driveways and at all other areas where ramping for vehicular or pedestrian access is provided. Curb ramps shall be provided wherever an accessible route crosses a curb including intersections, pedestrian crossings, mailboxes, playgrounds, parks, and recreational areas. Accessibility shall be considered for bike riders, strollers, and persons with disabilities. All gradients shall provide positive drainage (no ponding).

4.4.11.1 Task Order No. 1, FY 04, Phase 3. Street Replacement

All streets, sidewalks, curb and gutters will be removed throughout the Task Order No. 1 area. New streets, sidewalks, curb and gutters will be constructed within the project area. The new replacement streets will be 32 feet wide (back of curb to back of curb) with 4’ wide sidewalks on both sides. Sidewalks should be set back 4’ from the back of curb. The centerline alignment of the new streets will follow the existing street centerlines. See RFP drawings for street layout.

4.4.12 PAVEMENT SECTIONS

Pavement sections for streets shall be in accordance with the Ellsworth AFB Engineering Standards. For primary streets, the minimum pavement section shall be 2 inches of bituminous surface course, 2 inches of bituminous base course, 6 inches of aggregate base course, and 4 inches of subbase course over 12 inches of compacted subgrade. For secondary housing streets and parking lots, the minimum pavement section shall be 2 inches of bituminous surface course, 6 inches of aggregate base course, and 4 inches of subbase course over 12 inches of compacted subgrade.

4.4.12.1 Task Order No. 1, FY 04, Phase 3. Pavement Sections

Streets within the Task Order No. 1 area are secondary housing streets.

4.4.13 DRIVEWAYS

Driveway width shall match the width of the garage or be a minimum of 18-ft wide whichever is greater. Provide 5' separation between the driveways where two housing unit driveways are adjacent to each other. The minimum pavement section for driveways shall be 4 inches of fiber reinforced concrete over 6 inches of rigid base course over 6 inches compacted subgrade. Provide a 5-ft long by 6 inches deep thickened edge expansion joint along the entire width of the driveway slab abutting the garage floor slab. Provide a 5-ft long by 6 inches deep thickened edge along the entire width of the driveway slab abutting the street pavement. Two #4 bars shall be provided along the thickened edges.

4.4.14 OFF STREET PARKING

Three off street parking spaces shall be provided for each unit. Count driveways and garage spaces in satisfying the off street parking requirement. Garage space shall only be counted as one space.

4.4.15 SIDEWALKS

Existing sidewalk that is shown to be removed on the RFP drawings, damaged or is removed to install utilities shall be replaced to the original cross section. A continuous network of new sidewalks shall be provided along both sides of all streets. Provide a 4' set back from the back of the curb. Sidewalks should be a minimum of 4-ft wide. Provide a sidewalk to the driveway from the main entry of each unit. Play areas shall be connected to the sidewalk system that parallels the street. Ellsworth AFB does not want a network of sidewalks in the backyard area. Walks shall be of fiber reinforced concrete with a minimum nominal thickness of 4 inches and have a medium broom finish. Walks shall be placed over 4 inches of rigid base course course. Transverse contraction joint spacing shall be 4-ft for walks 4-ft wide. Expansion joint spacing shall not exceed 40-ft.

4.4.16 OUTDOOR LIVING SPACES

Outdoor living spaces include patios, decks, porches, and breezeways. If a porch is part of the architectural style of a home and functions as an integral part of the entry of the home through the front door, with no separate access from the interior of the home to the porch, the porch does not count as outdoor living space. The table below provides the minimum and maximum size limits for combined outdoor living spaces:

OUTDOOR LIVING SPACES SIZE LIMITS

RANK	MAXIMUM (SF)	MINIMUM (SF)
JENL/JNCO	150	120
SNCO/CGO	200	120
FGO/SOQ	250	120
GOQ	350	120

4.4.17 PATIO AND DECKS

The Air Force Family Housing Guide requires each living unit that opens to the exterior at ground level have a concrete patio with minimum area 120 sf and minimum front-to-back dimension of 8 ft. A raised deck of the same size is permissible if the unit does not open to the exterior at ground level. Such decks should be weather-resistant and slip-resistant. Any wood must be pressure treated. Patios shall be made of fiber reinforced concrete with a minimum nominal thickness of 4 inches and have a light broom finish. Provide a 2-ft long by 6-inch deep thickened edge on all four sides of the patio slab. Two #4 bars shall be provided along the thickened edges. Expansion joints shall be provided where the slab abuts to any other structure. Concrete patio slabs for handicapped housing units shall be placed over 12 inches of rigid base course over 3 inches of extruded polystyrene foam insulation to minimize frost heave. The insulation should extend laterally at least 5 feet past the edge of the slab. Concrete patio slabs for non-handicapped housing units shall be placed over 6 inches of rigid base course.

4.4.18 PATIO PRIVACY FENCE

A 6-ft high patio privacy fence shall be provided for each unit. Ellsworth AFB prefers the fence to be constructed of white PVC, but other materials and colors that are coordinated with the housing materials may be considered. All posts shall be provided with concrete footings. PVC posts shall be grouted full with 2 #5 bars. Depth and diameter of concrete footing shall prevent overturning. The length of fence provided shall coincide with the patio design. The minimum length of fence shall be 8-ft. The Contractor shall provide fence layout and details during the design process for approval.

4.4.19 PRIVACY FENCING (GOOD NEIGHBOR FENCE)

Provide privacy screening from adjacent housing units. Screening shall consist of a 6-ft high privacy "good neighbor" fence to function as a visual barrier between adjacent attached units. The minimum length of fence shall be 16-ft. The fence, post, and footings shall be constructed and installed to match the patio privacy fence. The Contractor shall provide fence layout and details during the design process for approval.

4.4.20 BACKYARD CHAINLINK FENCE

Each housing unit shall have a 2500 sq ft fenced in back yard. The minimum depth of the backyard is 40 ft. Common fences can occur between adjacent duplexes and between the housing units within a duplex arrangement. The fence shall be standard 48” high residential galvanized-coated chainlink steel fence. Each back yard shall have two pedestrian gates. Fence shall be provided with a top rail.

4.4.21 STREET SIGNS

All existing street and traffic control signs will be removed and replaced. Street name signs shall be provided at all street intersections and shall conform to base standards. The Contracting Officer will provide street names. Details of the street name signs, including mounting details, shall be per Ellsworth AFB standards and shall be submitted to the Contracting Officer for approval. Traffic control signs shall be provided at all street intersections and shall conform to requirements of U.S. DEPARTMENT OF TRANSPORTATION DOT D-6.1 Uniform Traffic Control Devices for Streets and Highways.

4.4.22 MAILBOXES

All existing mailboxes shall be removed. A new 75-unit gang mailbox with a pull off lane shall be installed at the location shown on the RFP drawings for Task Order No. 1. See PART 9 - HOUSING UNIT DESIGN/CONSTRUCTION for additional mailbox requirements.

4.4.23 CHILDREN'S PLAYGROUNDS

4.4.23.1 General Requirements

A playground area (3,500 square ft minimum) shall be provided for the 2 to 5 year old age group and another playground area (3,500 square ft minimum) shall be provided for the 5 to 12 year old age group. It is desirable to keep these playgrounds as two distinct areas, but they may be adjacent to each other. The total capacity of each area shall be 35 children. The Design Build Contractor is responsible developing the final site plans for the play areas. Play areas should be located within site lines of the housing units and shall minimize the number of streets that residents need to cross to obtain access to the playgrounds. Try to place playground areas in locations that take advantage of existing trees for shade. Play areas shall be buffered from wind by extensive landscaping design using trees and shrubs. Landscaping should not obstruct visibility of the playground from the housing units. All site lay out shall be subject to approval by the Government. Play areas shall be connected to the sidewalk system that parallels the street. Ellsworth AFB does not want a network of sidewalks in the backyard area. A combination bike and fitness trail is prohibited. The playground area shall be provided with pre-manufactured play equipment setting for the two age groups to be accommodated. A pre-manufactured play equipment setting includes an age

appropriate composite structure consisting of multiple play events for each of the following age groups; 2 to 5 years of age and 5 to 12 years of age. Other play events include freestanding equipment such as spring rocking equipment, swings and benches. The swing and spring rockers should be located as a freestanding play event on the perimeter of the play areas. All play equipment shall be located in the play zone with safety surfacing surrounding all structures. All playground design, equipment, and installation shall comply with the applicable safety requirements of ASTM F 1487, ASTM F 1292, and the Handbook for Public Playground Safety - Consumer Products Safety Commission (CPSC). The children's outdoor play area is an unsupervised play area and does not have a supervised play program for child development.

4.4.23.1.1 Child Safety and Accessibility

a) Accessibility to children and adults with disabilities: Play areas shall be accessible to children and adults with disabilities. In addition to wheelchair users, the needs of children and adults who walk with canes, walkers, or crutches; who have limited use of the upper body; who have visual or hearing disabilities, or who have developmental disabilities shall be considered. Design criteria based on child dimensions should be used for the proper functioning of the play area. Every part of a play area may not be accessible to all its users, but the social experience provided should be accessible to everyone. When more than one play activity of the same type is provided, one shall be accessible. When one activity is provided, it shall be accessible. A diverse play area has the greatest potential for meeting the needs of all users. Separate play areas for the physically challenged are not acceptable. Integrating all children in the same play setting is emphasized. Standard ADAAG guidelines for accessible routes, ramps for wheelchair access, transfer points, wheelchair accessible platforms, and accessible stepped platforms should be followed.

b) Age appropriate scale is a term used to describe equipment that will allow safe and successful use by children of a specific chronological age, mental age, and physical ability. Play equipment height and complexity shall not exceed the user's ability. The children's outdoor play areas shall meet age appropriate scale for the age groups that the areas are designed to accommodate.

c) Use zones. In accordance with ASTM F 1487, a use zone is a clear, unobstructed area under and around play equipment where a child would be expected to land when jumping or falling from a piece of play equipment. These zones shall be equipped with a playground safety surface in accordance with ASTM F 1292. Requirements for use zones vary for the age group and for different pieces of equipment. All use zones for play equipment shall be shown on the site plan to ensure there is no conflict between play activities on the ground and swinging or jumping from the equipment. Use zones will not overlap except for spring rocking equipment, balance beams, and playhouses.

d) Playground safety surface. A playground safety surface is constructed of a material that meets the shock absorbency criteria recommended in ASTM F 1292. Playground safety surfaces shall be provided throughout all use zones and under all play equipment as required by the ASTM.

e) The following play events are not appropriate for use in unsupervised play areas; Chain walks, chain or tire climbers, fulcrum seesaws, log roles, May poles, merry-go-rounds, rotating equipment, spring rocking equipment intended for standing, swinging exercise bars, trapeze bars, and whirls.

4.4.23.1.2 Playground Area Equipment

a) Age group 2 to 5 play equipment shall be the same as or equal to in play elements, features, quality and guarantee as Little Tikes, Play Builders, Play Structure 11.

b) Age group 5 to 12 play equipment shall be the same as or equal to in play elements, features quality, and guarantee as Little Tikes, Kids Builders, Structure 104.

c) Additional play equipment shall include two swing sets each with 2 seats. One swing set shall be installed near the 2 to 5 age group play structures and have belted tot swing seats. The other swing set shall have belt seats and be located near the 5 to 12 age group play structures.

d) Three spring rockers shall be located near the 2 to 5 age group play structures. Rockers shall include units that will be designed to seat one, two and three children at a time.

e) Four park benches, 6-ft long, with colored vinyl clad seat, back, and frame made of steel shall be installed around the periphery of the playground and near the sidewalks.

f) Safety surfacing shall be sand encompassing the entire required play zone except that portion required for handicap access to the transfer station which shall have 3 inch thick, 24 inch x 24 inch square rubber composition safety tiles designed for playground surfacing installed on 4 inch concrete paving. Safety tiles shall connect to the walkway system designed adjacent to the playground area and connecting to the local neighborhood sidewalks for wheelchair access. Sand safety surfacing shall be a minimum 12-inch thick, except at the bottom of all slides, stairs, climbers, etc. The sand shall be in a 6-ft circle centered on the element being increased to a thickness to 18 inch. No pea gravel or wood chips allowed for surfacing materials.

g) A sand play area, a minimum of 144 sq ft in size, shall be incorporated adjacent to the 2 to 5 year old play structure play area. Play sand depth shall be a minimum of 18 inch.

h) The sand play structure play area and play sand area shall all be encompassed in a containment structure made with recycled plastic timbers. Timbers shall be a minimum 6-inch wide and thick, and a minimum of 6 ft in length. Set timber 12 inch below grade so the tops of the timbers are at grade to reduce tripping hazards. Place timbers a minimum of two timbers in depth, overlap the lengths in half, and secure together with 10 inch spikes set flush with the timber surfaces. All timbers shall come be pre-manufactured with ½ inch radius edges. Radius all cut exposed ends of timbers ½ inch.

i) Colors of all play elements, benches, and timbers shall be approved by the base prior to ordering the equipment.

j) All equipment shall be located and spaced to provide more than adequate safety distances, required open play and fall zones around all equipment.

k) All play areas shall be designed to be sloping no more than 2% in any direction.

l) All equipment shall be installed by qualified personnel experienced in assembling this type of equipment. A manufacturer representative shall thoroughly inspect and approve in writing the installation of the play structures prior to use.

4.4.23.2 Task Order No. 1, FY 04, Phase 3. Specific Playground Requirements.

Task Order No.1 shall provide one playground area for the 2 to 5 year old age group and one playground area for the 5 to 12 year old age group. See RFP drawings for general location.

4.4.23.2.1 Basketball Court Requirements.

The existing half-court basketball standard, backboard, goal, and net will be removed and replaced. In addition, another new basketball standard, backboard, goal, and net shall be installed at the opposite end of the existing concrete slab. Goals shall be spring loaded, breakaway design.

4.4.24 COMMONS AREA

Commons area shall be a newly turfed open area placed immediately adjacent to each playground. The open area shall be connected to the walkway system connecting the playgrounds and the sidewalks located adjacent to the streets. It shall measure no less than 15,000 square ft in size. It shall also be located no less than 50-ft from any residential housing units. The commons area shall slope no more than 2% to 3% in any direction.

4.4.25 BUS SHELTER REPAIR

Existing bus shelters are primarily aluminum-framed structures with glazing panels. The glazing panels shall be replaced on these shelters. Glazed panels measure 5 feet 6 inches x 7 feet 0 inches (2 per each shelter) and 2 feet 6 inches x 7 feet 0 inches (2 per each shelter). New glazing shall be of laminated glass units, 1/4 inch thick. Laminated glass shall consist of two layers of fully tempered transparent flat type, clear glass. Glass shall be bonded together with a standard PVB interlayer. Glazing accessories and procedures shall be as recommended by the glazing manufacturer. The Contractor shall be responsible for repairing any damage to the bus shelters as a result of the relocation.

4.4.26 TASK ORDER NO. 1, FY 04, PHASE 3. BUS SHELTER NO. 1 RELOCATION AND REPAIR.

The Contractor shall relocate Bus Shelter No. 1 in addition to re-glazing described above. New concrete slabs shall be provided for the relocated bus shelter. Slab thickness shall match existing conditions. See RFP drawings for bus shelter location. See picture below:

Existing Bus Shelter No.1
Located on Washington Avenue

4.4.27 TASK ORDER NO. 1, FY 04, PHASE 3. BUS SHELTER NO. 2 RELOCATION AND REPAIR.

The Contractor shall relocate Bus Shelter No. 2 in addition to re-glazing described above. . New concrete slabs shall be provided for the relocated bus shelter. Slab thickness shall match existing conditions. See RFP drawings for bus shelter location. See picture below:

Existing Bus Shelter No. 2
Located on Jefferson Drive

4.5 SIDEWALK, PATIO, CURB AND GUTTER, AND PAVEMENT SPECIFICATIONS

4.5.1 GENERAL

Sidewalk, patio, curb and gutter, and pavements shall be constructed in accordance with Omaha District guide specification Section 02561 (SOUTH DAKOTA) PAVEMENTS FOR SMALL PROJECTS. The additional requirements listed below shall be incorporated into the guide spec. An unedited copy of Section 02561 is included at the end of RFP, Attachment 3. The Contractor shall be responsible for editing this specification.

4.5.2 CONCRETE SIDEWALK, PATIO, AND CURB AND GUTTER

Concrete sidewalk, patio and curb and gutter shall be specified in Omaha District guide specification Section 02561 (SOUTH DAKOTA) PAVEMENTS FOR SMALL PROJECTS. Concrete shall be fiber reinforced with a minimum 28-day compressive strength of 4000 psi. Type II cement shall be used in the production of concrete. For concrete with an exterior exposure, air-entrainment, producing a total air

content in the concrete between 4 and 7 percent by volume, shall be required. Expansion joints shall be sealed with cold-applied sealant, which is stone or grey in color.

4.5.3 BITUMINOUS SURFACE AND INTERMEDIATE COURSES

Bituminous surface and intermediate courses shall conform to the requirements in the Omaha District guide specification Section 02561 (SOUTH DAKOTA) PAVEMENTS FOR SMALL PROJECTS. Where the total thickness of bituminous concrete requires more than one lift, an intermediate course shall be specified beneath the wearing course. The total thickness of bituminous concrete shall not be less than 2 inches. 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.

4.5.4 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 02561 (SOUTH DAKOTA) 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 cutback asphalt, the Contractor may use cationic emulsified asphalt conforming to the requirements of ASTM D 2397, designation CSS-1 or CSS-1h.

4.5.5 BITUMINOUS TACK COAT

Contact surfaces of previously constructed pavement, curbs, and other structures shall be sprayed with a thin coat of bituminous material conforming to the requirements found in Omaha District guide specification Section 02561 (SOUTH DAKOTA) 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.

4.5.6 PAVEMENT MILLING AND OVERLAY

Asphalt milling and overlay shall conform to the requirements found in Omaha District guide specification Section 02561 (SOUTH DAKOTA) PAVEMENTS FOR SMALL PROJECTS.

4.5.7 AGGREGATE BASE COURSE

Aggregate base course shall conform to the requirements found in Omaha District guide specification Section 02561 (SOUTH DAKOTA) PAVEMENTS FOR SMALL PROJECTS and shall have a California Bearing Ratio (CBR) of at least 80.

4.5.8 RIGID BASE AND SUBBASE COURSES

Rigid base course shall be placed directly underneath concrete and subbase course shall be placed beneath 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 02561 (SOUTH DAKOTA) 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 of crushed gravel with fines.

4.5.9 CONCRETE DRIVEWAYS

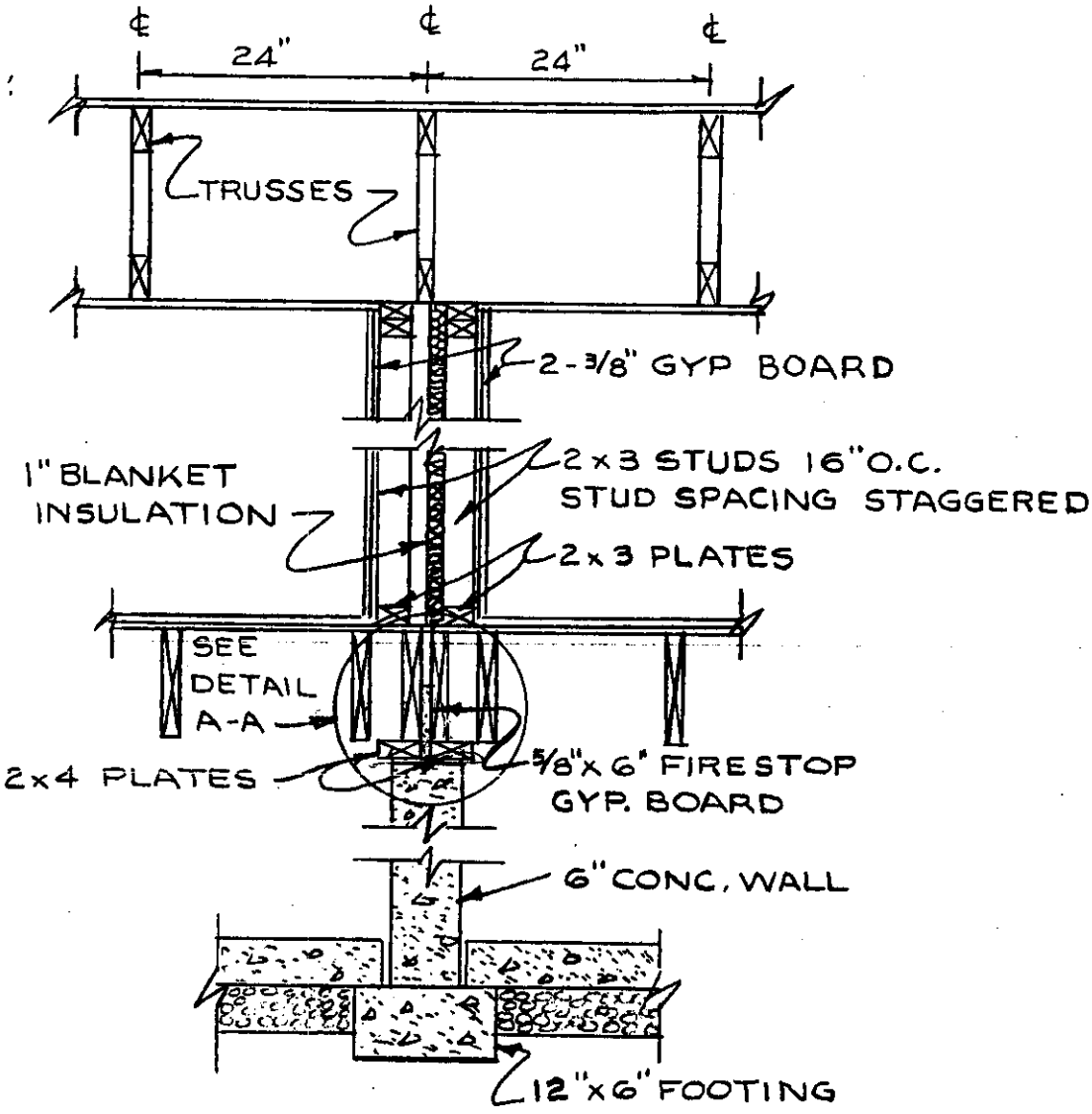
Concrete shall conform to the requirements in the Omaha District guide specification Section 02561 (SOUTH DAKOTA) PAVEMENTS FOR SMALL PROJECTS. Concrete shall be fiber reinforced with a minimum 28-day compressive strength of 4000 psi. Type II cement shall be used in the production of concrete. For concrete with an exterior exposure, air-entrainment, producing a total air content in the concrete between 4 and 7 percent by volume, shall be required.

4.5.10 JOINT SEALING

Joints in concrete pavements may be sealed with field-molded sealant. Field molded joint sealant shall be specified in the Omaha District guide specification Section 02561 (SOUTH DAKOTA) PAVEMENTS FOR SMALL PROJECTS.

4.5.11 AGGREGATE SURFACE COURSE

Aggregate surface course aggregate shall conform to the requirements in the Omaha District guide specification Section 02561 (SOUTH DAKOTA) PAVEMENTS FOR SMALL PROJECTS.



PARTY WALL DETAIL
BLDG TYPE A-3

SCALE 3/4" = 1'-0"

Same Sizmar

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PART 5 – SOILS AND SUBSURFACE CONDITIONS

INDEX

5 SOILS AND SUBSURFACE CONSIDERATIONS

5.1 SOIL AND FOUNDATION REPORT (GEOTECHNICAL REPORT)

The Government has prepared a site-specific Final Foundation Analysis (Geotechnical Report) based on a site-specific subsurface investigation. The report is included in Attachment 1 of the RFP documents and presents the final foundation and geotechnical-related requirements for design. This report provides an overview of soils and geologic conditions encountered at the project site, as well as specific directives and recommendations on which foundation is to be based.

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The Offeror shall certify in writing that the design of the project has been developed consistent with the site-specific Geotechnical Report. The certification shall be stamped by the Offeror and shall be submitted with the 100 percent site design submission. If revisions are made to the 100 percent site design submission, a new certification shall be provided with the final design submission.

5.1.1 SOIL COMPACTION

TABLE 5-1 - SOIL COMPACTION

Subgrade Preparation, Fills, Embankments, and Backfills	Compaction Requirements (Percentage of Maximum Density)
Structures & Building Slabs	95
Streets & Paved Areas	95
Sidewalks	90
Grassed Areas	90

The soil compaction requirements stated are the minimum required. These requirements shall be verified or modifications recommended in the final Geotechnical Report if engineering, soils, or climatic factors indicate the necessity. Any modification to the stated compaction requirements subsequent to Notice To Proceed shall require the approval of the Contracting Officer.

5.1.2 CAPILLARY WATER BARRIER AND VAPOR BARRIER

A capillary water barrier and vapor barrier is required for all interior slabs on grade, including garages, and crawl spaces. As a minimum, the vapor barrier shall be a polyethylene sheet not less than 10 mils thick. Provide a 6-inch crushed rock capillary water barrier below the vapor barrier. See PART 10 – HOUSING UNIT STRUCTURAL DESIGN, paragraph SLABS-ON-GRADE.

5.1.3 SOIL TREATMENT

Soil treatment for termites is not required.

5.1.4 DECAY TREATMENT

Decay treatment shall be in accordance with HUD 4910.1.

5.1.5 RADON MITIGATION

The design and construction of foundation walls and slabs shall include provisions for the reduction of radon entry and facilitate its removal. See PART 11 - UNIT DESIGN- PLUMBING, paragraph RADON PREVENTION AND TESTING.

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PART 6 – GRADING, DRAINAGE, AND EROSION CONTROL

INDEX

6 GRADING, DRAINAGE, AND EROSION CONTROL

6.1 REFERENCES

6.1.1 DEPARTMENT OF THE AIR FORCE TECHNICAL MANUALS (AFM)

AFM 88-5, Chap. 1 (August 87) Surface Drainage Facilities for Airfields and Heliports. (TM 5-820-1)

AFM 88-11, Vol 2 (March 85) Sanitary and Industrial Wastewater Collection - Pumping Stations and Force Mains. (TI-814-10)

6.1.2 HANDICAPPED ACCESSIBILITY STANDARDS

ADAAG (Jan 1998) Accessibility Guidelines for Buildings and Facilities

6.1.3 NATIONAL OCEANIC AND ATMOSHPERIC ADMINISTRATION (NOAA)

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

6.1.4 AIR FORCE FAMILY HOUSING GUIDE

6.2 GRADING

6.2.1 GENERAL

The Grading and Drainage Plans provided in the RFP are to be considered as preliminary and are provided as information to assist the Contractor in preparing his proposal. Any errors identified shall be brought to the attention of the Contracting Officer immediately for resolution and direction. The Design Build Contractor shall provide final Grading and Drainage Plans as part of the design package. Provide positive drainage away from all houses on all sides with a minimum slope of 8% for 10-ft. The Contractor shall confine all work, except utility upgrades, to the project boundaries indicated on the RFP drawings. Provide for a minimum of 8 inches exposure of foundation walls above finish grade except at raised front entrance porches, handicap entrances and patios, and for patios with a finish elevation 4 to 6 inches lower than housing unit finish floor elevation. The maximum grade in unpaved areas shall not exceed 5% where possible with the exception of retention areas. Drainage system shall be properly coordinated with surrounding properties to insure that runoff does not cause damage to other properties. Temporary ponding on the site will be acceptable. However, temporary ponding of a depth of greater than 3 inches or for a duration of more than an hour will not be acceptable. 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 specification Section 02300A EARTHWORK. An unedited copy of Section 02300A is included at the end of RFP, Attachment 3.

6.2.2 ADJUSTMENT OF EXISTING STRUCTURES

All manholes, valve boxes, 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, or valve boxes fall within a surfaced or unpaved roadway or parking, any standard-duty frames and covers shall be removed and replaced with heavy-duty frames and covers. 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.

6.2.3 BORROW AND WASTE

Phase 1 and Phase 2 Replace Family Housing project has generated a stockpile of approximately 30,000 CY of material. The Contractor is encouraged to use this material in Task Order No. 1. It is the Contractors responsibility to make sure the material is suitable for its intended use. The Contractor is prohibited from using this stockpile material for any off base use. See RFP drawings for stockpile location and access. Any surplus materials not required for fill shall be used for berm construction. **No soil shall leave Ellsworth AFB.** If there is still excess soil after the creation of berms, the soil shall be stockpiled at the area shown on the RFP

If the Contractor chooses not use the Phase 1 and 2 stockpile for borrow, any additional borrow materials required 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. Any surplus materials not required for fill shall be used for berm construction. **No soil shall leave Ellsworth AFB.** If there is still excess soil after the creation of berms, the soil shall be stockpiled at the area shown on the RFP drawings.

6.2.4 SIDEWALKS AND CURB AND GUTTER

Concrete walks shall have a maximum transverse grade of 2 percent. Maximum longitudinal walk grade shall be 5 percent. Handicapped accessible walks with a longitudinal slope greater than 5 percent shall be considered a ramp. Curb cuts shall be provided for handicapped accessibility at intersections of drives and walks. 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 houses and at entryways. 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.

6.2.5 HOUSE FLOOR ELEVATION

Finished floor elevation shall be set to ensure that the required minimum and maximum grades are met and that there is positive drainage away from the housing unit. Provide for a minimum of 8 inches exposure of foundation walls above finish grade except at raised front entrance porches, handicap entrances and patios, and for patios with a finish elevation 4 to 6 inches lower than housing unit finish floor elevation.

6.2.6 DRIVEWAYS

Driveways shall slope down from the garage with an algebraic difference of grades at any one point not greater than 6 percent, 2 percent cross-slope.

6.2.7 GRADES AWAY FROM HOUSES

a. Minimum of 8 percent for 10 ft.

6.2.8 OVERLOT GRADES

Provide positive drainage for all areas.

a. Minimum 1 percent for cohesionless sandy soils.

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

6.2.9 DITCH SLOPES

a. Minimum grade of 1.0 percent for channelized flow.

b. All new ditches shall be graded at non-erodible slopes or the ditch shall be lined with an appropriate material to prevent erosion. A design storm with a return period of at least 2 years shall be used to determine erodibility of ditches and swales.

6.3 STORM DRAINAGE

6.3.1 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 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 5-820-1 is used to determine the peak discharge, the minimum time of concentration for turfed or paved areas shall be 5 minutes.

6.3.1.1 Design Storm Return Period

Storm drains and culverts shall be sized for a design storm with a return period of 25 years. Provisions shall be made to protect all houses and critical structures from a major storm event with a return period of 100 years.

6.3.1.2 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.

6.3.2 GENERAL STORM DRAINAGE SYSTEM DESIGN REQUIREMENTS

The Grading and Drainage Plans provided in the RFP are to be considered as preliminary and are provided as information to assist the Contractor in preparing his proposal. Any errors identified shall be brought to the attention of the Contracting Officer immediately for resolution and direction. The Design Build Contractor shall provide final Grading and Drainage Plans as part of the design package. The design shall include new and/or modifications to the existing storm drainage system. The complete storm drainage system shall be designed to minimize the number of drainage structures required. 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 maximum distance between drainage structures shall be approximately 300-ft for conduits less than 30 inches in diameter. The maximum distance between drainage structures shall be approximately 500 ft for conduits 30 inches and greater in diameter. Storm runoff in streets with curbing shall be collected using curb inlets or area inlets. The use of curb openings with flumes to drain water from streets with curbing will not be permitted unless approved by the Government. Drainage of runoff from turfed areas onto pavements shall be minimized. Where possible, a minimum drop of 0.2-ft 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 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 circumstance shall existing or new storm drain lines be located beneath the new housing units.**

6.3.3 TASK ORDER NO. 1, FY 04, PHASE 3. SPECIFIC STORM DRAIN REQUIREMENTS.

See Demolition Plans and Grading and Drainage Plans for specific storm drainage requirements for Task Order No. 1, Phase 3.

6.3.4 STORM DRAINAGE MATERIALS

All storm drain pipe and structures shall be specified in UFGS Specification SECTION 02630A STORM-DRAINAGE SYSTEM. An unedited copy of Section 02630A is included at the end of RFP, Attachment 3. Submittal of pipe samples is not required. The Contractor shall refer to the Corps of Engineers standard details for any storm drain details required by the design. The standard details are available at the Corps FTP site. The Contractor shall provide details for any other drainage structures used that are not found in the Corps standard details.

6.3.4.1 Manholes

Diameter of manholes shall be large enough to accommodate pipes entering/exiting the manhole. Manhole cast iron frames shall have a minimum opening diameter of 24 inches. Galvanized steel ladders shall be provided in all manholes with a depth exceeding 12-ft in accordance with UFGS Specification SECTION 02630A STORM-DRAINAGE SYSTEM.

6.3.4.2 Area Inlets

Area inlets shall be properly sized and designed to accommodate the design flows. Grating shall be of "Bicycle Proof" design.

6.3.4.3 Curb Inlets

Locating curb inlets at driveway entrances shall be avoided. 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.

6.3.4.4 Head walls and Flared End Sections

Unless otherwise approved, head walls or flared end sections shall be provided at the ends of culverts and at storm drain outfalls. Protection from erosion and scouring at head wall and flared end section outfalls shall be provided as needed.

6.3.4.5 Culverts

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

6.3.4.6 Gutters and Downspouts

Houses shall be provided with gutters and downspouts. Downspouts shall be extended a minimum of 5-ft from the house. Preformed concrete splash blocks shall be provided for all downspouts. Downspouts shall be located to avoid discharging onto sidewalks or driveways due to safety concerns of ice forming on the sidewalks and driveways.

6.3.4.7 Storm Drain and Culvert Pipe

The Contractor shall select the appropriate storm drain and culvert pipe materials from the options specified in UFGS Specification 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 soil tight. The Contractor shall specify

watertight pipe joints and flexible resilient pipe connectors at drainage structures when the water table is at or above the pipeline.

6.3.4.7.1 Concrete Pipe

Reinforced concrete pipe shall be a minimum Class III. 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 pipe shall be assumed to have a minimum design service life of 50 years unless the Contractor determines that conditions at the site will reduce the service life. 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.

6.3.4.7.2 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. Plastic pipe shall be assumed to have a minimum design service life of 50 years unless the Contractor determines that conditions at the site will reduce the service life.

6.4 FOUNDATION DRAINAGE SYSTEM

6.4.1 GENERAL

The Grading and Drainage Plans provided in the RFP show the location and size of the foundation drain collection system. These drawings are to be considered as preliminary and are provided as information to assist the Contractor in preparing his proposal. Any errors identified shall be brought to the attention of the Contracting Officer immediately for resolution and direction. The Design Build Contractor shall provide final layout and details of the foundation drainage system as part of the design package. The foundation drain shall consist of 4 or 6-inch diameter perforated pipe surrounded by free-draining granular material. The drainage material should extend a minimum of two pipe diameters around the circumference and should be surrounded by an 8-oz. non-woven geotextile to prevent fines migration into the material. The perforated pipe itself should not be wrapped. Since the depth of over excavation is relatively shallow compared to the ground water table, the drain may be located at the base of the over excavation to aid in keeping the structural fill layer dry. Foundation drains shall be provided around the entire outside perimeter of all foundations. Flows generated by the foundation drains of each task order shall be tied together and routed to a single monitoring manhole and then discharged into the existing underground storm drainage system. Foundation drains shall not be tied into the sanitary sewer system. A gravity system is preferred and the Designer shall make every effort to avoid a pumping system. Sump pumps will not be allowed inside of the housing units. If pumping is necessary, limit the number of pumps by ganging the drainage tile together and routing to a single lift station. Lift station will then pump the foundation drainage flow to the nearest underground storm drain.

6.4.2 FOUNDATION DRAIN SYSTEM DESIGN

The Design Build Contractor shall submit drawings and details of the foundation drainage system. As a minimum provide typical cross section at the foundation, location of all drainage pipe, lift stations, force mains, and discharge point. Specification shall be provided for approval covering the work, materials and equipment as well as engineering calculations supporting the selection of piping and equipment. The Design Build Contractor shall verify the drainage capacity and invert elevations to ensure that the drainage

system is adequate for the flows generated by the family housing units. Force mains and lift stations shall be designed in accordance to TI-814-10 Sanitary and Industrial Wastewater Collection - Pumping Stations and Force Mains.

6.4.3 FOUNDATION DRAIN SYSTEM MATERIALS

6.4.3.1 Foundation Drain Pipe

The Contractor shall provide foundation drainage pipe in accordance with UFGS Specification SECTION 02620A SUBDRAINAGE SYSTEM. An unedited copy of Section 02620A is included at the end of RFP, Attachment 3.

6.4.3.2 Foundation Drain Force Main Pipe

The Contractor shall provide foundation drainage force main pipe in accordance with UFGS Specification SECTION 02532A FORCEMAINS AND INVERTED SIPHONS, SEWER. An unedited copy of Section 02532A is included at the end of RFP, Attachment 3.

6.4.3.3 Lift Stations

Lift stations, if required, shall be a simplex submersible sump pump rail system package with a shutoff and check valve located in a 24-inch diameter basin with cover. They shall be fully assembled for outside installation. The covers shall be the type to withstand vehicle loading or the stations shall be protected from traffic loads. Lift stations shall not be located within housing unit yards. Each lift station shall be provided with lifting chain, quick-connect rail system, discharge piping, inlet flange, junction box, start-stop level controls, high water alarm, internal wiring, external alarm and pump control panel, sump pump and motor, concrete hold-down pad, control panel with alarm light, etc.

6.4.3.4 Sump Pumps

Exterior electric sump pumps shall be provided as required for the foundation drainage system. A plug connector is required. Provide a compatible grounding outlet for a plug and cord type electrical connection. The pumps shall be of the automatic, electric motor-driven, submerged type, complete with necessary control equipment and with a split or solid cast-iron or steel cover plate. The pumps shall be direct connected by an approved flexible coupling to a vertical electric motor having a continuous oiling device or packed bearings sealed against dirt and moisture. Motors shall be totally enclosed, fan-cooled and shall be equipped with an across-the-line magnetic controller in a NEMA 250, “Enclosures for Electrical Equipment (1000 Volts Maximum)”, Type 4 enclosed, across-the-line, magnetic controller. Each pump shall be fitted with a high-grade thrust bearing mounted above the floor. Each shaft shall have an alignment bearing at each end, and the suction inlet shall be between 75 and 150 mm (3 and 6 inches) above the sump bottom. The suction side of each pump shall have a strainer of ample capacity. A float switch assembly, with the switch completely enclosed in a NEMA 250; Enclosures for Electrical Equipment (1000 Volts Maximum), Type 4 enclosure, shall start and stop each motor at predetermined water levels. The discharge line from the pump shall be provided with a union or flange, a non-clog swing check valve, and a stop valve in an accessible location near the pump.

6.5 ERROSION 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. BMPs shall conform to Omaha District Specification SECTION 01356 STORM WATER POLLUTION PREVENTION MEASURES. An unedited copy of Section 01356 is included at the end of RFP, Attachment 3. The Contractor shall maintain all erosion and sediment measures and other protective measures in effective operating condition. All temporary structural practices shall be removed once the corresponding disturbed drainage area has been permanently stabilized. This project will require coverage

under a National Pollution Discharge Elimination System (NPDES) general permit for storm water discharges associated with construction activity. See Section 01355 ENVIRONMENTAL PROTECTION for specific requirements.

6.5.1 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 70-ft. The entrance shall be maintained in a condition that 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 tires of the vehicles shall be washed before entering the road or street. Any mud that is tracked onto roads or streets shall be removed at least once daily.

6.5.2 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.

6.5.3 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-ft 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.

6.5.4 STRAW BALE BARRIER

Straw bale barriers may not be installed across ditches.

6.5.5 OUTLET PROTECTION

Preformed riprap lined scour holes or other suitable measures shall be installed at outlets of culverts and storm drains as needed to prevent erosion.

6.5.6 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.

6.5.7 ROCK CHECK DAM

Rock check dams may be installed in ditches that 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 3-ft. 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.

6.5.8 TEMPORARY SEDIMENT TRAP

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

6.5.9 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.

6.5.10 OTHER CONTROLS

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

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PART 7 – LANDSCAPE

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7 LANDSCAPE

7.1 REFERENCES

7.1.1 HANDICAPPED ACCESSIBILITY STANDARDS

ADAAG (Jan 1998) Accessibility Guidelines for Buildings and Facilities

7.1.2 AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI/ASME)

ANSI Z60.1 (1990) Nursery Stock

7.1.3 U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FED STD 795 (Basic) Uniform Federal Accessibility Standards

7.2 GENERAL

The Contractor shall be responsible for total care of turf and plant materials for a period of 120 days after turfing and landscaping operations under a task order are complete or until all work under that task order has been completed and accepted, whichever period is longer. All plant materials planted on this project shall be warranted for one year after final acceptance of the entire project.

7.3 LANDSCAPE PLANTING PLANS

The Design Build Contractor shall obtain and use the services of a qualified landscape architect that is experienced in site planning and planting design. Design documents shall provide landscape plans for each type of housing unit and a complete, integrated landscape planting plan for the overall housing project. The design shall reflect appropriate groupings, foundation plantings, playground and common area plantings, and street tree plantings to define the open spaces to ensure a complete landscaped project. Design shall reflect little landscaping in front of family units. Choose plant materials on the basis of plant hardiness, climate, soil conditions, low maintenance, and quality. Selected plant materials shall be easily maintained and tolerant of the specific site conditions. Planting or seeding shall occur only during periods when beneficial results can be obtained.

7.3.1 HOUSING UNIT LANDSCAPE

Sod shall be installed in the front and side yards. Back yards and disturbed areas shall be seeded. Landscaping shall include the installation of one large deciduous tree and three evergreen shrubs in the front yard of each housing unit. This represents the minimum number of new trees and shrubs that will be acceptable. The 5-foot gap between adjacent driveways shall be finished with 3-inch deep, 1-1/2 inch washed river gravel over landscape fabric. Planting will not be allowed within 5 feet of any foundation wall. Wood mulch shall not be used in landscaping. Shrub beds shall be 3-inch deep, 1-1/2 inch washed river gravel with landscape fabric and heavy-duty plastic edging. Tree beds shall be 3-inch deep, 1-1/2 inch washed river gravel with landscape fabric and heavy-duty plastic edging.

7.3.2 *HOUSING UNIT LANDSCAPE (BETTERMENT)*

Landscape betterment shall include the installation of sod in the fenced-in backyards of the housing units. Other betterments could include the installation of two small flowering trees, two large deciduous,

and two evergreen trees in both the front and rear yards of the residences and the installation of small and medium deciduous shrubs and low and medium height growing evergreen shrubs along the front and sides of the residences. Wood mulch shall not be used in landscaping. Shrub beds shall be 3-inch deep, 1-1/2 inch washed river gravel with landscape fabric and heavy-duty plastic edging. Tree beds shall be 3-inch deep, 1-1/2 inch washed river gravel with landscape fabric and heavy-duty plastic edging. Additional landscaping located in the open space between the housing units will also be acceptable.

7.3.3 PLAYGROUND AREA LANDSCAPE

Play lot shall be buffered from wind by extensive landscaping design using trees and shrubs. As a minimum, 5 Summit Ash deciduous trees, 2-1/2 inch caliper and 5 Black Hills Spruce evergreen trees 6 feet tall should be planted. Trees shall be ball and burlapped, planted with 4-inch deep saucers, and staked. Wood mulch shall not be used in landscaping. Tree beds shall be 3-inch deep, 1-1/2 inch washed river gravel with landscape fabric and heavy-duty plastic edging.

7.3.4 COMMONS AREA LANDSCAPE

Each commons area shall be surrounded by 8 Summit Ash deciduous trees, 2-1/2 inch in caliper, and 8 Black Hills Spruce trees, 6 feet tall. Trees shall be ball and burlapped, planted with 4-inch deep saucers and staked. Wood mulch shall not be used in landscaping. Tree beds shall be 3-inch deep, 1-1/2 inch washed river gravel with landscape fabric and heavy-duty plastic edging.

7.4 TREES AND SHRUBS

Trees and shrubs shall be nursery grown or plantation grown stock conforming to ANSI Z60.1. They shall be grown under climatic conditions similar to those in the locality of the project. Use local grown plant material obtained from local nurseries. Trees and shrubs shall be installed from the following listing. The sizes indicated above the following plants are the minimum acceptable sizes on this project.

Large Trees: 2-1/2 inch caliper and larger

Summit Ash	Marshall Seedless Ash
Littleleaf Linden	Thornless and Seedless Honeylocust
American Linden	

Small trees: 1-1/2 inch caliper and larger

Canada Red Cherry	Newport Plum
Disease resistant Crabapple	Washington Hawthorne

Evergreen Trees: 6 feet tall

Black Hills Spruce	Colorado Green Spruce
Colorado Blue Spruce	Ponderosa Pine

Deciduous Shrubs: 5-gallon size

Lodense Privet	Redleaf and Greenleaf Barberry
Viburnums	Spireas
Burning Bush	Dwarf Arctic Willow
Serviceberry	Western Sandcherry
Dogwoods	Lilacs
Purpleleaf Plum	Forsythia
Mockorange	Potentilla

Evergreen Shrubs: 5-gallon size

Low growing junipers: Savin Von Ehron, Compact Andorra, Compact Pfitzer, Tamarix, Arcadia, Mugho Pine, and Brown Yew

Semi Upright: Maney juniper, Andorra, and Savin

7.4.1 QUALITY

Well-shaped, well-grown, vigorous, healthy plants having healthy and well-branched root systems shall be provided. Plants shall be free from disease, harmful insects and insect eggs, sunscald injury, disfigurement, and abrasion. Plants shall be provided that are typical of the species or variety, and conforming to standards as set forth in ANSI Z60.1.

7.4.2 MEASUREMENT

Plant measurements shall be in accordance with ANSI Z60.1.

7.4.3 INSTALLATION

Verify the location of underground utilities. When obstructions below ground or poor drainage affect the planting operation, proposed adjustments to plant location, type of plant, and planting method or drainage correction shall be submitted. Proposed plant locations shall be staked and approved prior to planting. The plant material shall be installed during appropriate planting times and conditions recommended by the trade for the type and variety of plant material specified. Plant pits shall be excavated and backfilled as recommended by the trade and ANSI Z60.1. The planting operation shall be performed only during periods when beneficial results can be obtained. When special conditions warrant a variance to the planting operations, proposed planting times shall be submitted in writing.

7.4.4 MAINTENANCE

Installed plants shall be maintained in a healthy growing condition. Maintenance operations shall begin immediately after each plant is installed. The maintenance of plants shall include periodically straightening plants, tightening stakes and guying material, repairing tree wrap, protecting plant areas from erosion, maintaining erosion control material, supplementing mulch, accomplishing wound dressing, removing dead or broken branch growth by pruning, maintaining edging of beds, checking for girdling of plants and maintaining plant labels, watering, weeding, removing and replacing unhealthy plants.

7.4.5 UNHEALTHY PLANT

A plant shall be considered unhealthy or dead when the main leader has died back, or 25 percent of the crown is dead. Determine the cause for an unhealthy plant. Unhealthy or dead plants shall be removed immediately and shall be replaced as soon as seasonal conditions permit in accordance with the following warranty paragraph.

7.4.6 WARRANTY

Furnished plant material shall be guaranteed to be in a vigorous growing condition for a period of 12 months regardless of the contract time period. A plant shall be replaced one time under this guarantee. Transplanting existing plants, for the convenience of the Government, requires no guarantee.

7.5 TURF

7.5.1 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/or sodding. Areas within the limits of sod shall have 3 cubic yards per 1000 square feet of manure or humus worked into the top 6 inches of soil.

7.5.2 SEEDING AND SODDING

7.5.2.1 Seeding

Basic requirement is to seed back yards and all disturbed areas. All newly seeded areas shall be fertilized with no less than 200 lbs. of 18-46-0 fertilizer per acre. All seeded areas shall be seeded by hydromulching techniques using 2000 lbs. of green-tinted, wood-fiber hydromulch per acre. Seed shall be hydromulched at twice the recommended rate. State approved seed of the latest season's crop shall be provided in the original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with applicable State seed laws. Seed mixtures shall be proportioned by weight. Weed seed shall not exceed one percent by weight of the total mixture. Moldy or otherwise damaged seed shall be rejected. Seed mixing shall be performed by a seed supplier prior to delivery to the site.

Seed Mixture

Mixture	% Mixture
Fairway Crested Wheatgrass	40
Rebel III Tall Fescue	30
South Dakota Common Kentucky Bluegrass	30

Seed at a rate of 8 lbs. per 1,000 sf

7.5.2.2 Sodding

Basic requirement is to sod front and side yards with a betterment to sod enclosed back yards. All newly turfed areas shall be fertilized with no less than 200 lbs. of 18-46-0 fertilizer per acre. Sod shall be state-certified as classified by applicable state laws. Sod shall be locally grown and be comprised of a mixture of predominantly improved varieties of Tall Fescue similar to Rebel III. It shall be free of thatch, diseases, nematodes, soil-borne insects, weeds or undesirable plants, stones, 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 1-3/16 inch within a tolerance of ¼ inch, 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.

7.5.3 ESTABLISHING TURF

All sodded and seeded areas shall be watered, mowed and fertilized to establish the turf after installation. Rainfall totals may be considered in the total amount of rainfall needed per week. After the initial seeding or sodding the soil shall be kept moist (but not soaked with water ponding on the surface) continuously for a period of 2 weeks and not allowed to dry out. Water amounts at this stage shall be no less than 3 inches per week. Thereafter, the seeded or sodded area shall be watered a minimum of 3 times per week every other day for a total of 2 inches of water per week. Watering shall be accomplished with portable sprinklers, pipes, and hoses. Watering trucks may not be used. All turfed areas shall be mowed when the height of the grass becomes 4 inches to a mowed height no less than 2-1/2 inches tall. The turfed areas shall be continuously watered and mowed for a period of 120 days after the initial installation and final acceptance. All turfed areas shall be fertilized as initially, one more time before final acceptance. An acceptable lawn is defined as one with 98% of the turfed areas covered with grass, no bare spots larger than 6 inches square, and turfed density with no less than 200 blades per square foot. When a weed species is known to be in the turf, identify the species and the area to be treated. When application of a pesticide becomes necessary to remove a weed species, a pesticide treatment plan shall be submitted and coordinated with the Contracting Officer. A state certified applicator shall apply required pesticides in accordance with

EPA label restrictions and recommendations. Clothing and personal protective equipment shall be used as specified on the pesticide label.

PART 8 – SITE UTILITIES

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8 SITE UTILITIES

8.1 GENERAL

The Utility and Demolition Plans provided in the RFP are to be considered as preliminary and are provided as information to assist the Contractor in preparing his proposal. Any errors identified shall be brought to the attention of the Contracting Officer immediately for resolution and direction. The Design Build Contractor shall provide final Utility and Demolition Plans as part of the design package. The Contractor shall avoid running utilities underneath streets, sidewalks, and parking lots where at all practicable. **Under no circumstance shall existing or new utilities be located beneath the new housing units.** In cases where it is necessary for the utilities to cross existing streets and sidewalks, the Contractor shall install lines by trenchless methods. Open trench methods will not be allowed unless written permission is obtained and approved by the Contracting Officer. When open trench methods are approved, streets and sidewalks shall be sawcut and removed and replaced to match existing conditions. Portions of walks and concrete pavements requiring removal shall be removed to the nearest contraction joint. All existing utilities, including but not limited to electrical, sewer, gas, water, and communication lines that are crossed during installation of new utilities shall remain in service during construction. If this is not possible, all outages shall be coordinated with the Contracting Officer fourteen (14) days prior to outage. All underground utilities from field data and surveys, site investigations, and digging permit locates, shall be marked within and adjacent to areas of the work. All work areas shall be investigated with detection devices for cables and pipelines, to confirm locations, identify unknown utilities, and establish depths. All underground utilities potentially disturbed by the work shall be found by hand digging prior to mechanical trenching or excavating in the vicinity. The Government Representative shall be notified of detection activities 48 hours in advance. Detection devices shall be on-site at all times. All new utilities shall be surveyed for location and elevation prior to backfilling. Coordinates and elevations of all branch lines and changes in direction shall be documented and provided to the Contracting Officer.

8.2 WATER DISTRIBUTION SYSTEM AND SERVICE LINES

8.2.1 GENERAL

The Contractor shall provide a complete, usable, new water distribution system (water mains) and water service lines for the indicated family housing area. The new water distribution and service system shall be sized adequately to meet required water demands. Demands shall include fire and domestic water for housing in accordance with the requirements specified herein. All utility layouts shall be subject to approval by the Government. The following paragraphs further describe the system requirements.

8.2.2 REMOVALS

Existing water mains shall be abandoned in place as indicated on the RFP drawings. Water service lines shall be removed as indicated on the RFP drawings. At locations where abandoned water main intersects with a main to remain, a portion of the water line shall be removed to provide the required separation. Abandoned water lines shall be capped or plugged with concrete appropriately at both ends of the line. Abandonment of the existing water main shall be phased in order to maintain fire protection to existing units. The Contractor shall be aware that most of the existing water mains are old asbestos cement pipes. Because most of the water mains are asbestos cement, the existing water main should remain undisturbed as much as possible. When removing a portion of the water main or abandoning asbestos cement pipe, the Contractor shall ensure adequate safety and health procedures are used and ensure compliance with all applicable federal and state regulations. The contractor is required to submit an addendum to the

Accidental Prevention Plan for approval describing procedures to be used to abandon or remove portion of the old pipe and connect new water main line to existing asbestos cement water main. This portion of the Accident Prevention Plan shall describe, as a minimum: employee training, employee personal protective equipment, removal procedures and equipment, means of controlling asbestos fiber release, any air monitoring to be performed, and plans for disposal of discarded asbestos cement pipe of connections. Existing active water main shall be provided with adequate joint restraint.

All existing fire hydrants shall be removed. The existing hydrant lead shall be removed within 3 feet behind the curb and cap. The top section of all valve boxes shall be removed. Where connections are made between the new work and existing mains, the connections shall be made by using specials and fittings to suit the actual conditions. When made under pressure, these connections shall be installed using standard methods as approved by the Contracting Officer. If any existing water line is damaged during construction, the repair shall be made by and at the Contractor's expense in a satisfactory manner.

8.2.2.1 Task Order No. 1, FY 04, Phase 3. Demolition Plan.

See RFP drawings for the limits of the removals required for Task Order No. 1.

8.2.3 CRITERIA

All connections made by the Contractor to the existing water distribution system (water mains) shall be in accordance with PART 2 - CRITERIA REFERENCES, all applicable local, state, and federal standards, and as stated herein. Water mains shall be designed and constructed in accordance with the references listed in PART 2 - CRITERIA REFERENCES and applicable UFGS requirements. Service lines shall also be designed and constructed in accordance with the references listed in PART 2 - CRITERIA REFERENCES and applicable UFGS requirements. The piping pressure class is 150 psi for water system. Water mains shall be considered as that part of the water system supplying fire hydrants. Pipes supplying groups of dwelling units or one housing unit exclusively shall be referred to as service lines. Contractor shall verify that the water mains are valved so that not more than two hydrants will be out of service due to a single break in the water distribution system. Isolation valves shall be installed such that interruptions to service can be confined to no more than 10 family housing units or one-half of street or cul-de-sac. Isolation valves shall be easily accessible and as a minimum shall be at the intersection of mains. The Contractor shall be responsible for protection of the existing water main line where the new water main is to be connected. If any water line is damaged during construction, the repair shall be made by and at the Contractor's expense in a satisfactory manner. The Contractor shall disinfect all new water lines and any remaining lines that do not remain fully pressurized during construction or connection. Main and service line piping shall be disinfected in accordance with the American Association Standard AWWA C-651 and shall not be considered complete until two consecutive days of bacteriological samples show no contamination.

The water distribution and service system shall be sized to accommodate the domestic demand required for the housing units served. The water domestic demand shall be in accordance with the Uniform Plumbing Code Fixture Count Method. The sizing of the waterline pipe diameter shall be determined by using Hazen-Williams "C" value of 130 for plastic pipe and 120 for other pipe material. A maximum velocity of 10 feet per sec shall be used for metallic pipe, and 5 feet per sec shall be used for nonmetallic piping. Water lines shall be of a depth to provide **a minimum cover of 6 feet** from the existing ground surface, or from the finished grade, whichever is lower, to the top of the pipe.

8.2.3.1 Water Mains Requirements

Water mains shall be considered as that part of the water system supplying fire hydrants. The Contractor shall provide a new water distribution line of adequate size to satisfy both domestic and fire flow requirements. No main extension shall be less than 8 inches in diameter. Distribution piping shall generally be a looped system design. Dead ends up to 300 feet long are permitted if terminated by fire

hydrants or flushing hydrants. The Contractor shall verify existing pressures and flow conditions (see Flow Requirements paragraph). When installing PVC plastic type water lines, the Contractor shall verify and ensure no islands of existing metallic pipe exist. If there are islands of pipe then they need to be connected to the Cathodic Protection system.

8.2.3.2 Water Service Lines Requirements

The service lines shall include the pipeline connecting the water distribution lines to the connection with the housing unit. Service connections for water lines 2-inches or smaller diameter shall be via a new directly tapped corporation stops, or by a service clamp. A corporation stop and a copper gooseneck shall be provided with either type of connections. Service lines larger than 2-inches shall be connected to the main by a tapped saddle, tapping sleeve and valve, service clamp or reducing tee, depending on the main diameter and the service line diameter, and shall have a gate valve. All service stops and valves shall be provided with service boxes. Pipe, joints, fittings, valves, and specials shall be in accordance with UFGS SECTION 02510A Water Distribution System. Ellsworth AFB prefers copper tubing, Type K, annealed, conforming to ASTM B88. The service lines to each duplex shall be not less than 1 1/4-inch in size and then branch to each housing unit. Water service line to each unit shall be sized according with the Uniform Plumbing Code.

8.2.3.3 Flow Requirements

The domestic demand for the new Family Housing Units served shall be designed in accordance with the Uniform Plumbing Code Fixture Count Method. System design shall provide a minimum residual pressure of 20 psi at each fire hydrant. Minimum required fire suppression flow rates and duration shall conform to MIL HDBK-1008C which is available on the Internet at the following web address: [http://www.hnd.usace.army.mil/techinfo/milhbk.htm]. This is mandatory flow over and above domestic requirements. Domestic pressure shall be minimum of 20 psi. All plugs, caps, tees, bends, and hydrants on water mains and hydrant laterals shall be provided with reaction backing or movement plastic pipe.

A hydraulic water system model was used at Ellsworth to evaluate the current water system pressures at three different locations. The results of the hydraulic analysis are presented in Table 8-1.

TABLE 8-1
SIMULATED FLOWS AND PRESSURES
ELLSWORTH AIR FOR BASE

Location	Water System Pressure		Instantaneous Fire Flow[1]
	Average Day Demand	Maximum Day Demand	
Intersection of Washington Street & Jefferson Street	63 psi	64 psi	3,200 gpm
Intersection of Roosevelt Street & Jefferson Street	64 psi	65 psi	2,700 gpm
East of new squad ops building along Bergstrom Drive	87 psi	87 psi	3,400 gpm[2]

Footnote:
[1] Instantaneous fire flows determined under maximum day demand conditions with a minimum system residual pressure of 20 psi.
[2] Fire flow increases to approximately 4,200 gpm with proposed booster pump station.

The following operating conditions were used for the at results presented in Table 1:

- One pump at Main Pump station operating (~ 2,600 gpm).
- One pump at existing booster station operating (~ 420 gpm).

- Rushmore Elevated Tank water level at 30 feet (8 feet low).
- Ellsworth Elevated Tank water level at 30 feet (7 feet low).
- B-5 project completed (under construction).

The **validity** of the water flows and pressures provided from the water modeling analysis is not completely reliable and **will require validation**. Therefore, the Contractor will need to verify flow and pressure available in the existing water systems by conducting on-site fire hydrant flow testing. For determination and documentation of fire protection, the Contractor shall conduct and provide a fire flow test. Fire Hydrant Flow tests shall be done in accordance to NFPA 291. Data to be included with the flow test are static pressure, residual pressure, flowrate, data and time test was conducted, and name of personnel conducting the fire hydrant test in accordance with AWWA Manual 17. Also include all supporting calculations utilized in determining fire flow requirements. The Contractor shall coordinate with the Ellsworth AFB Fire Department and Base CE prior to conducting such test. If the flow and pressure test show no adequate pressure in the existing water system, the Contractor shall contact the Contracting Officer for further instructions.

8.2.3.4 Fire Hydrants

Fire Hydrants shall be provided in accordance with all requirements as set forth in MIL_HDBK-1008C. All fire hydrant hydrants shall be color as requested by Ellsworth AFB. All fire hydrants shall be Mueller Co. or approved equal. The Fire Hydrant shall be UL listed, dry barrel, resilient seat type, and conform to AWWA- C-502 with valve opening at least 5-inches in diameter. The fire hydrants shall be designed so that the flange at the main valve seat can be removed with the main valve seat apparatus remaining intact, closed and reasonably tight against leakage and with a breakable valve rod coupling and breakable flange connections located no more than 8 inches above the ground grade. Hydrants shall have a 6-inch bell connection, two 2-1/2 inch hose connections and one 4-1/2 inch pumper connection. Outlets shall have American National Standard fire-house coupling threads. Working parts shall be bronze. Design, material, and workmanship shall be equal to the latest stock pattern ordinarily produced by the manufacturer. Hydrants shall be painted with 1 coat of red iron oxide, zinc oxide primer conforming to SSPC Paint 25 and 2 finish coats of silicone alkyd paint conforming to SSPC Paint 21 of the installation's standard color or as directed by the Contracting Officer. Fire Hydrant shall be in accordance with UFGS SECTION 02510A Water Distribution System. Fire hydrant spacing shall be no greater than 500 feet apart by paved road, with no dwelling unit more than 300 feet by paved road -from at least one hydrant. Preference is to install hydrants at intersections whenever possible. Hydrant laterals shall be 6 inches minimum size, shall not exceed 50 feet in length, and shall have an underground shut off valve with an adjustable valve box in each lateral within 10 feet of the hydrant for isolating hydrant, unless otherwise allowed by Ellsworth AFB Fire Department. Hydrants shall have their pumper outlet facing the street. Hydrants shall be located a minimum of 3 feet and a maximum of 7 feet from pavement, and shall not be located in sidewalks or where obstructed by parked vehicles, shrubbery, etc.

8.2.3.5 Cathodic Protection

Soils have an anticipated corrosion activity range from mild to severe and cathodic protection of water distribution system components, including fire hydrants, is required. Corrosion protection shall be provided for all gray or ductile-iron piping, fittings, valves, and other water line appurtenances, regardless of pipe material. Corrosion protection shall consist of a sacrificial anode type cathodic protection system. See paragraph Cathodic Protection for additional guidance.

8.2.3.6 Hydrostatic Leakage Tests

Hydrostatic pressure and leakage tests shall be conducted on the new water lines in accordance with UFGS SECTION 02510A Water Distribution System. Where any section of a water line is provided with concrete thrust blocking for fittings or hydrants, tests shall not be made until at least 5 days after the installation of the concrete thrust blocking, unless otherwise approved.

8.2.3.6.1 Pressure Tests

After the pipe is laid, the joints completed, fire hydrants permanently installed, and the trench partially backfilled leaving the joints exposed for examination, the newly laid piping shall be subjected for 1 hour to a hydrostatic pressure test of 200 psi. Each valve shall be opened and closed several times during the test. Exposed pipe, joints, fittings, hydrants and valves shall be carefully examined during the partially open trench test. Pressure test shall be in accordance with UFGS SECTION 02510A Water Distribution System.

8.2.3.6.2 Leakage Tests

Leakage test shall be conducted after the pressure test has been satisfactory. The duration of each leakage test shall be at least 2 hours, and during the test the water line shall be subjected to not less than 200-psi pressure. Leakage test shall be in accordance with UFGS SECTION 02510A Water Distribution System.

8.2.3.6.3 Concurrent Hydrostatic Tests

If allowed by code, the Contractor may elect to conduct hydrostatic test using either or both of the following procedures. Regardless of the sequence of tests employed, the results of pressure tests, leakage tests, and disinfection shall be satisfactory as specified. All replacement, repair or retesting required shall be accomplished by the Contractor at no additional cost to the Government.

1) Pressure test and leakage test may be conducted concurrently.

2) Hydrostatic tests and disinfection may be conducted concurrently, using the water treated for disinfection to accomplish the hydrostatic test. This may only be accomplished after the system has been thoroughly flushed with water until all entrained dirt and mud has been removed. If water is lost when treated for disinfection and air is admitted to the unit being tested, or if any repair procedure results in contamination of the unit, disinfection shall be re-accomplished. Testing, correction and retesting shall be accomplished at no additional cost to the Government.

8.2.3.7 Disinfection

Before acceptance of potable water operation, each unit of completed waterline shall be disinfected as prescribed by AWWA C 651 and in accordance with UFGS SECTION 02510A Water Distribution System.

8.2.3.8 Coordination

All work on existing and new water lines is to be coordinated with the Contracting Officer or his designee prior to construction

8.2.3.9 Cutting Pipe

Cutting pipe shall be done in a neat and workmanlike manner without damage to the pipe and in accordance with UFGS SECTION 02510A Water Distribution System. Unless otherwise recommended by the manufacturer and authorized by the Contracting Officer, cutting shall be done with an approved type mechanical cutter. Wheel cutter shall be used when practicable. Copper tubing shall be cut square and all burrs shall be removed. Squeeze type mechanical cutters shall not be used for ductile iron.

8.2.3.10 Installation of Water Lines

Installation of water lines parallel to sewer lines shall be completed in a manner such that the water lines shall be laid at least 10 feet horizontal distance from any existing or proposed sanitary sewer, storm sewer or sewer manhole. Where water lines cross house sewers, storm sewers, or sanitary sewers, there shall be

at least 18-inch vertical distance between the bottom of the water main and the top of the sewer pipe and one full length of water pipe must be located so both joints will be as far from the sewer as possible.

A water line may cross below a non-perforated sewer main if minimum vertical separation of 18-inch is provided and sewer main is of acceptable water line pipe material and is a continuous piece of a least 20 feet in length with the length of the water pipe located so both joint are as far as possible from the sewer main. A water main may cross either above or below a non-perforated sewer line with vertical separation of less than 18-inches if either the water or sewer line is encased in PVC, cast iron or 6 inches of concrete for at least 10 feet each side of the crossing. If PVC or cast iron is used as encasement material, the ends shall be sealed with concrete.

8.3 SANITARY SEWAGE SYSTEM

8.3.1 GENERAL

The Contractor shall provide a complete, usable, new sanitary sewage system for the indicated family housing area. All sewer mains and laterals in the project area shall be replaced. The new sewage system shall be sized adequately to meet required demands. All utility layouts shall be subject to approval by the Government. The following paragraphs further describe the system requirements.

8.3.2 REMOVALS

Existing sewer mains shall be abandoned in place except where as indicated on the RFP drawings. Sewer laterals shall be removed as indicated on the RFP drawings. Existing manholes shall be abandoned in place and the inlets and outlets plugged or blocked and the bottom of the manhole shall be filled with flowable fill or concrete just above the inlets and outlets. The top 4 feet of the manhole shall be removed and then filled and compacted to final grade. The sewer laterals shall be disconnected from the existing sewer main and the ends shall be plugged or capped with concrete or watertight seal placed on the wye connecting at the main to prevent infiltration of groundwater. The excavation and backfilling of the lines shall be as specified in the UFGS SECTION 02316A Excavation, Trenching, and Backfilling for Utilities.

8.3.2.1 Task Order No. 1, FY 04, Phase 3. Demolition Plan.

See Demolition Plans of the RFP drawings for the limits of the removals required for Task Order No. 1.

8.3.3 CRITERIA

Sanitary sewage system shall be designed and constructed as specified in the listed references in PART 2 - CRITERIA REFERENCES, and in accordance with local codes and regulations, and with UFGS Specifications. The minimum earth cover over sewer lines is 48 inches. All sewage piping shall be in accordance with UFGS SECTION 02531A Sanitary Sewers. Fittings and joints shall be compatible with the pipe supplied and have strength not less than that of the pipe.

8.3.3.1 Sewer mains

Existing sewage collection system mains in the project area shall be abandoned in place as indicated on the RFP drawings. Abandoned sewer mains shall be capped or plugged with concrete appropriately at both ends of the line. The sewer main pipe provided shall be sized to handle the new housing project sewer capacity. The Contractor shall verify the adequacy of the current sanitary sewer system at the Family Housing. The Contractor shall provide verification of the existing sewer system capacity (verify if existing 8-inch diameter size of the sewer main can handle the new proposed housing units and the homes on Crazy Horse Court). The Contractor shall provide calculations validating system capacity, and to verify that the proposed 8-inch sewer main line has sufficient capacity to serve the family housing project. Sewer main may be replaced by pipe bursting, or open trenching. The Contractor shall submit a drawing showing the location and existing construction of all sewer mains and identify the sewer mains to be replaced and by which method. The Contractor is required to camera test all sewer pipes if pipe bursting is the method

selected. The Contractor shall also submit a specification for approval covering the work that clearly defines his methods, materials and equipment as well as engineering calculations supporting his proposed selection of materials.

The existing sewage system within the Capehart 190 Area was constructed approximately 40 years ago and consists of nine separate collection mains interconnected to transfer wastewater from the northwest corner of the site to a sewage lift station located at the southwest corner of the site. All of these transmission mains are located within the street right-of-way (generally behind the curb) with individual service lateral connections from the front of each unit. The existing mains range from approximately 10 feet to over 16 feet deep in order to provide service to the basement of each unit. This sewage system serves the Capehart 190 Area and also the homes on Crazy Horse Court. The removal or abandonment of the interconnecting transmission main shall be phased after the construction of a new main to keep service to the homes of Crazy Horse Court.

8.3.3.2 Sewer Laterals

New sewer laterals shall be provided for each housing unit. Sewer lateral lines (connections from interior family housing sewer lines to main) shall be minimum of 4 inches for single-family units. Each housing unit lateral shall be connected directly to the sewer main. Combining multiple laterals is prohibited. Each housing unit shall have a separate sewer lateral line. Only interior house sewer lines may be placed under a housing unit. All sewers under the housing units shall be as specified in the Paragraph entitled "Plumbing." House sewer lines from any one unit shall not pass under any other unit(s). Cleanouts shall be provided to allow cleaning of all lines. An approved type of two-way cleanout fitting or dual cleanout shall be installed outside the housing unit within five foot of the foundation. Cleanouts shall be provided for all branches at points of change in direction before running out to a main. Foundation and roof drains shall not be connected to the sanitary sewer.

8.3.3.3 Minimum Velocity

A minimum velocity shall be 2.5 feet per second when flowing at the maximum design flow depth. Design pipes with 80 percent full as critical flow depth. All design slopes shall be calculated using Manning's equation. The Contractor shall provide all calculations for approval.

8.3.3.4 Domestic Sewage Requirement

The domestic sewer demand for the new Family Housing Units served shall be designed and constructed in accordance with the Uniform Plumbing Code Fixture Count Method.

8.3.3.5 Wye Branches.

Wye branches shall be installed where new service sewer connects main sewers. The installation of wye branches in a sewer shall be made by a method that does not damage the integrity of the sewer. Wye branches shall be installed as specified in the with UFGS SECTION 02531A Sanitary Sewers

8.3.3.6 Manholes.

Manholes shall be designed as indicated herein. The Contractor shall provide new manholes in lieu of cleanouts, wye connection and / or other appurtenances when connecting new service sewer line to the main sewer and the installation of a wye-connection and/ or connecting to an existing manhole could damage the integrity of the existing manhole. Manholes are installed at 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 1.5 feet above the manhole floor, a drop connection shall be provided.

8.3.3.7 Connection to Existing Manholes

Pipe connections to existing manholes shall be made so that finish work will conform as nearly as practicable to the applicable requirements specified for new manholes, including all necessary concrete work, cutting, and shaping. The connection shall be centered on the manhole. Holes for the new pipe shall be of sufficient diameter to allow packing cement mortar around the entire periphery of the pipe but no larger than 1.5 times the diameter of the pipe. Cutting the manhole shall be done in a manner that will cause the least damage to the walls.

8.3.4 CALCULATIONS AND DRAWINGS

Details of all sanitary sewage structures shall be shown on the final drawings. The Contractor shall provide calculations of the design of the new sewer mains, slopes and invert elevations, and provide profiles of the proposed layout. The drawings shall provide enough information for the necessary topographic and utility surveys.

8.3.5 COORDINATION

All work on existing and new sewer line to be coordinated by Contractor with the CO or his designee prior to construction.

8.3.6 LEAKAGE TESTS

Lines shall be tested for leakage by low-pressure air testing, infiltration tests or exfiltration tests, as appropriate. Low-pressure air testing for PVC pipe materials shall as prescribed in UBPPA UNI-B-6 (UNI-BELL PVC PIPE ASSOCIATION). Low-pressure air testing procedures for other pipe materials shall use pressures and testing times as described in ASTM C 828 and C 924, after consultation with the pipe manufacturer. Prior to infiltration or exfiltration tests the trench shall be backfilled up to at least the lower half of the pipe. If required, sufficient additional backfill shall be placed to prevent pipe movement during testing, leaving the joints uncovered to permit inspection. Visible leaks encountered shall be corrected regardless of leakage test results. When the water table is 2 feet or more above the top of the pipe at the upper end of the pipeline to be tested, infiltration shall be measured using a suitable weir or other device acceptable to the Contracting Officer (CO). When the Contracting Officer determines that infiltration cannot be properly tested, an exfiltration test shall be made by filling the line to be tested with water so that a head of at least 2 feet is provided above both the water table and the top of the pipe at the upper end of the pipeline to be tested. The filled line shall be allowed to stand until the pipe has reached its maximum absorption, but not less than 4 hours. After absorption, the head shall be reestablished. The amount of water required to maintain this water level during a 2-hour test period shall be measured. Leakage as measured by either the infiltration test or the exfiltration test shall not exceed 0.2-gallon per inch diameter per 100 feet of pipeline per hour. When leakage exceeds the maximum amount specified, satisfactory correction shall be made and retesting accomplished. Testing, correction and retesting shall be accomplished at no additional cost to the Government. Leakage Test shall also conform to UFGS SECTION 02531A Sanitary Sewers.

8.3.7 TEST FOR DEFLECTION

When flexible pipe is used, a deflection test shall be made on the entire length of the installed pipeline not less than 30 days after completion of all work including the leakage test, backfill, and placement of any fill, grading, paving, concrete, or superimposed loads. Deflection test shall conform to UFGS SECTION 02531A Sanitary Sewers.

8.4 GAS DISTRIBUTION SYSTEM

8.4.1 GENERAL

The Contractor shall be responsible for designing new gas mains and laterals for the new family housing units. Lines shall be a minimum 1-inch sized in accordance with the NFPA 54. Each occupant's or family housing unit shall have a separate gas line. All gas distribution systems shall comply with the requirements of NFPA 54; "National Fuel Gas Code." When connecting to existing steel piping system(s), provision shall be made to ensure that the integrity of the catholic protection is not compromised. Shutoff valves shall be provided on the exterior of each housing unit. A gas regulator and provision for future installation of an individual gas meter to monitor fuel use shall be provided for each occupant's or family housing unit. The housing unit service entrance shall be installed at a height sufficient to allow for future installation of the gas meter. Existing gas laterals shall be physically disconnected from all gas sources and removed. Installation of gas piping will be in accordance with ANSI B31.8; "Gas Transmission and distribution Piping Systems" and 49 CFR; "Transportation of Natural Gas and Other Gas and Other Gas by Pipeline: Minimum Federal Safety Standards".

8.4.2 REMOVALS

All existing gas mains and service lines on the site that are no longer used shall be physically disconnected from all gas sources, capped, and removed. Abandoning existing gas piping is not allowed.

8.4.2.1 Task Order No. 1, FY 04, Phase 3. Gas Line Removals.

See Demolition Plans of the RFP drawings for the limits of the removals required for Task Order No. 1.

8.4.3 GAS MAINS

Contractor is responsible for all design and details. The design of the gas-distribution system will be based on a demand equivalent to not less than 80 percent of the full-connected appliance load. In addition, the size of pipe in sections of a distribution system that serves not more than 15 housing units in an isolated area and in service lines to individual housing units will be based on the full-connected appliance load. The lines will be well looped within the main area and in all outlying areas whenever practicable and economically feasible to do so. It is not practicable to loop a supply line to an outlying area back into the main system, but in such cases the objectionable effects of dead ends can often be relieved to some extent by looping such lines around the area it serves back into itself.

Gas mains shall be placed with a minimum of 24 inches of earth cover. Gas mains shall not be laid under streets 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 4 feet of cover over the top of the pipe.

8.4.3.1 Task Order No. 1, FY 04, Phase 3. Gas Mains.

The new gas distribution system for Task Order No. 1. shall connect to the existing 2" gas main as shown on the RFP drawings. The new main gas distribution piping shall be designed as a looped system with no dead ends. The natural gas available at the point of connection has a heating value of 1000 BTU/CF at approximately 5 psig. The Contractor shall verify existing gas pressure available prior to design of the system. Except for piping located at the gas service regulator assembly, no aboveground gas piping shall be exposed to view.

8.4.4 SERVICE LINES

Provide a separate underground service line for each housing unit. The gas service lines shall extend from the gas main point of connection up to, and including, the housing unit gas service regulator assemblies. Service lines shall run parallel and/or perpendicular to the housing unit lines and shall be buried at least 24

inches below ground surface, except where located under streets, pipes shall be buried at least 4 feet. Service lines shall not be laid in the same trench with other utilities other than water as mentioned above, and shall be above other utilities whenever they cross. Size of the service line shall be sufficient to supply the peak gas demand for each housing unit without excessive pressure drop, but shall not be less than 1 inch in size.

8.4.4.1 Service Line Shutoff Valves

Each service line shall be provided with an underground shutoff plug valve, conveniently located outside of any traffic area and readily accessible to maintenance and emergency personnel. Shutoff valves shall be protected with a cast-iron valve box. Shutoff valves located in sidewalks are prohibited.

8.4.4.2 Gas Service Regulator Assembly

Each gas service line shall be provided with a gas service regulator assembly, located at the exterior of each housing unit. Assemblies shall consist of an aboveground shutoff valve, a pressure regulator sized to handle the peak gas demand of the housing unit, and a piping configuration to allow installation of a future gas meter. Connection between the underground polyethylene piping and above steel piping shall be made through an "anodeless" riser. Service regulator assemblies shall be located in an inconspicuous location and to the greatest extent possible, and be located so as not to be visible from the front entrance to the unit. If this is not possible, the meter shall be hidden by landscaping shrubs or by a screen wall. Above grade steel gas service piping shall be painted gray.

8.4.5 MATERIALS

Materials and appurtenances shall be free of defects and suitable to accomplish the stated objectives of gas distribution system. Exterior pipe that is buried below grade shall be polyethylene as described below. Exterior pipe that is above grade shall be steel pipe in accordance with ASTM A53; "Pipe, Steel, black and Hot-Dipped, Zinc-coated Welded and Seamless."

8.4.5.1 Polyethylene Pipe

Polyethylene pipe shall conform to ASTM D2513; "Standard Specification for Thermoplastic Gas Pressure Piping Systems", with fittings complying with ASTM D2683; "Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing." Connections to metal pipe shall comply with ANSI B16.5; "Pipe Flanges and Flanged Fittings," or manufacturers recommended standards.

8.4.5.2 Valves

Plastic shutoff plug valves, with cast-iron valve boxes, shall be installed at all connections to existing lines, at intersections of new lines, and at other intermediate locations so that interruptions of service is confined to no more than 10 housing units at any one time.

8.4.6 CATHODIC PROTECTION

Cathodic protection shall be provided for all underground gas distribution system metallic pipe, fittings, and valve material. Design of cathodic protection system shall in accordance with the Electrical Distribution System below. When connecting to existing steel piping systems, provisions shall also be made to ensure that the integrity of the existing cathodic protection systems is not compromised.

8.4.7 COORDINATION

All work on existing and new gas lines shall be coordinated with the Contracting Officer prior to construction with advance notice given for outages.

8.4.8 TESTING

8.4.8.1 Destructive Tests of Plastic pipe Joints

Each day, prior to making polyethylene heat fusion joints, a joint of each size and type to be installed that day shall be made by each person performing joining of plastic pipe that day and destructively tested. It the test fails, the qualified joiner who made the joint shall not make further field joints in plastic pipe on this job until that person has been retrained and requalified.

8.4.8.2 Pressure Tests

Prior to testing the system, the interior of the piping shall be blown out, and shall be cleaned and cleared of all foreign materials. The Contractor shall prove the entire system of gas mains and service lines as a whole to be gas tight by air test in accordance with ANSI B31.8. Since the Contractor will be required to make use of the existing gas mains, the Contractor shall design and install provisions in the new system to allow isolating it from all existing portions of the existing system to accommodate pressure testing. Test shall continue for at least 24 hours between initial and final readings of pressure and temperature.

8.5 ELECTRICAL DISTRIBUTION

8.5.1 GENERAL

Contractor shall maintain uninterrupted service to all areas during these alterations and additions. The existing electrical distribution system consists of the underground primary feeder that is connected to pad-mounted transformers located throughout the area. Secondary service shall be extended from these pad-mounted transformers to each dwelling. A primary meter exists at the primary service to the family housing development. Contractor shall ensure that construction does not destroy the existing metering scheme.

8.5.2 SYSTEM DESIGN

The existing housing area is presently served from an existing underground 7.2 kV single-phase primary line generally located in the open area at the rear of the existing houses. The existing secondary distribution system consists of underground secondary to each duplex with a common panel at each duplex housing unit.

The Contractor shall be responsible for any relocation or design of the primary electrical distribution system based on the Contractors site design. The 15 kV cable (primary) shall be suitable for use in wet or dry locations in concrete encased underground duct. Conductor size shall be 500 KCMIL copper for feeder circuits, 4/0 copper for branch circuits and 1/0 for minor radial taps. The 15 kV cable shall be single conductor, compressed class B stranding, bare copper conductor, extruded strand screen flexible thermosetting dielectric based on an Ethylene-Propylene compound (EPR), extruded insulation screen, metallic shield, and overall insulating PVC jacket. It shall be rated 90 C. for normal operation. The service feeder (TYPE USE cable) shall be routed from the transformer to each family housing unit panel board. The distribution transformers serving the housing units shall be connected to ensure balancing of loads on all three phases of the feeder. The following criteria pertains to the exterior electrical distribution system design within the housing area:

(a) Ensure that the new electrical primary system conforms to base standards, i.e., concrete encased 4” or 5” duct, EPR 133% insulation, feeder circuits 600A (4/0 copper cable), branch circuits 200A (1/0 copper cable), elbow terminations, all switches and terminations above ground, vaults beneath switchgear and transformer housing, no splices below ground, fault indicators, exterior enclosures finish to be according to Federal Standard 595a, Color 33578, loop fed design, switching for back feeding, conform to base numbering system. Shall include, unless otherwise

stated, one spare with pull cord for each type of service, i.e., power. Provide conduit separation per IEEE C2.

(b) Neutral conductors, cable shields, and all other noncurrent-carrying metallic parts of equipment shall be grounded. Ground resistance of not greater than 25 ohms shall be provided except at switches and transformers, where 10 ohms shall be the maximum unless soil conditions will not permit.

(c) Label all cables, where they come from and where they go. The Contracting Officer shall approve label material and methods.

(d) Paint all pad mounted equipment (includes transformers, junction cabinets and switches) in accordance with Base standards. Provide minimum 100 mm thick concrete pad on gravel base. Pad shall extend a minimum of 300 mm beyond the footprint of installed equipment. Provide a ground grid consisting of #1/0 awg CU conductor with a CU ground rod installed at each corner.

The proposed primary modifications consist of utilizing the underground primary loop distribution as much as practical. In the event the new unit loads exceed the existing transformer lateral feeder capacity, the Contractor shall replace that entire lateral feeder to the nearest switch. The Contractor shall reuse existing pad mounted transformers to the maximum extent possible and provide new pad mount transformers with number and size per calculated load. In the event the new unit loads exceed an existing transformer rating, the Contractor shall replace that transformer. The number of units served by a transformer shall not exceed eight. See **Section 01332 SUBMITTALS DURING DESIGN** for additional guidance regarding calculations.

8.5.3 METHODS

8.5.3.1 High Voltage Cable

High voltage cable shall be installed in concrete encased PVC conduit in accordance with NESC with a continuous cable marker tape 6 inches below grade. Cable shall have the same characteristics as the existing cables.

8.5.3.2 Underground Splices

Underground connection or splices are prohibited, except in handholes. Splices shall be in a self-draining, rodent resistant box with a cover. New handholes shall match or equal existing handholes now in use at the Ellsworth AFB.

8.5.3.3 Service Laterals

Service laterals shall be direct buried a minimum 4’ below grade. Cable marking tape shall be installed over service laterals. Secondary service lateral cables shall have the same characteristics as the existing cables. Secondary service shall be copper.

Each housing unit shall be provided with one underground secondary electrical service, originating from a transformer, to the service entrance of each family unit. Contractor shall provide all material and equipment to construct new secondary electrical service. The main disconnect shall be located on the exterior of the family housing units.

8.5.3.4 Service Entrance

Provide a service entrance to each housing unit and split to each unit using a NEMA 3R junction box. Each unit shall have a meter socket with jumper plates and clear weather sealed cover. Locate entrance in area readily accessible by service personnel while not distracting from the housing unit appearance. Fault current at the unit service entrance must not exceed 10,000 amps.

8.5.3.5 Transformers

Transformers shall be low profile pad-mounted and have two non-fused switches for a loop connection. Pad-mounted transformers shall be dead front, and have separable insulated load break connectors. Transformers shall also be provided with oil-immersed, bayonet-type, overload fuses in series with partial range current-limiting fuses. Pad-mounted transformers shall be placed on a fiberglass base with basement. The high voltage compartment of the transformer shall have load break elbows.

Contractor shall be responsible for verifying that the transformer size is adequate for the number of family housing units served by that transformer. The Contractor shall reuse existing pad mounted transformers to the maximum extent possible and provide new pad mounted transformers with number and size per calculated load. In the event the family housing unit loads exceed an existing transformer rating, the Contractor shall replace that transformer. Any existing transformer that is not used shall be salvaged and turned over to Ellsworth AFB. To arrive at demand load for each unit use demand loads for each living unit calculated in accordance with National Electric Code, Article 220 except the air conditioning or electric heating loads, whichever is larger, sized for 100 percent demand. In selecting a transformer, the nameplate rating shall not be less than 100% of the kilovolt amperes total load calculated for the transformer using the table below. Not more than 8 (eight) living units shall be supplied from one transformer.

D E M A N D F A C T O R P E R C E N T A G E

Number of Living Units	% of Total of Demand Load for Units
2	80.0
3	60.0
4-8	50.0

8.5.3.6 Coordination

All work on new, or existing, electrical distribution systems shall be coordinated with the Contracting Officer or his designee prior to construction. Additional work required on the electrical system by new construction or calculation results shall meet the requirements and standards of the National Electrical Code, the National Electrical Safety Code, and the Ellsworth AFB. The Contractor shall warrant reused electrical equipment for a period of not less than one year from substantial completion.

8.6 POWER FOR FOUNDATION DRAINAGE SYSTEM

Contractor shall provide electrical power as required for the foundation drainage system.

8.7 STREET AND AREA LIGHTING

The existing street lighting system consists of 25' metal poles with roadway type lighting fixture. These fixtures are in relatively good repair and will be removed as necessary depending on the site conditions and reinstalled on new concrete footing where required. The existing streetlights are presently connected to the housing unit transformers. Secondary circuits to these lights will be utilized where possible. Existing night lighting control systems will be reused for automatic dust to down operation. Lighting levels will be a minimum of 0.2 foot-candles average. The layout of the existing street lighting system presently conforms to foot-candle levels recommended in the Family Housing Guide.

If new street lighting is required, the Contractor shall ensure that the replaced street lighting is of the same quality and design as the existing. The Contractor shall coordinate any new street lighting installation with the Contracting Officer. Contractor is responsible for any damage to the existing street lighting that is to be reinstalled. Street light circuits shall be underground in Schedule 80 PVC conduit. Where street lighting

circuits cross roadways provide concrete encased PVC conduit and extend the concrete encasement a minimum of 2 meters beyond the edge of the roadway.

8.8 TELEPHONE SYSTEM

The Qwest Telecommunications Company will design, furnish, and install the exterior telephone distribution cables, telephone boxes, and connections to the new housing units. Qwest point of contact is Roy Boone (605) 394-4720.

a) The removal and relocation of the communication lines and equipment shall be coordinated with Ellsworth AFB and Qwest. The telephone system shall be located underground in the rear of the housing units and installed in the same trench as the electrical distribution and cable TV systems. The Contractor shall be responsible for assuring that telephone, power, and cable TV layouts are thoroughly coordinated and that they are installed in accordance with all codes, regulations, requirements, and specified clearances. The service entrance shall be located in the "mechanical" room of the new family housing units. Two 4 pair telephone cables are required to each new housing unit; one 4 pair cable for telephone service to the unit and one 4 pair cable for an optional additional line (data line for home PC use).

b) The existing local telephone provider is Qwest. The Telephone Company will provide all of the exterior work up to the exterior terminal box of each family housing unit. The Contractor is totally responsible to ensure that this is accomplished. The Contractor shall contact the local provider for telephone service requirements to coordinate the installation of the telephone system for the family housing unit. The Contractor is responsible for coordinating with and for ensuring that Qwest receives whatever information and drawings required in doing the exterior telephone design. See **PART 14 – UNIT DESIGN - ELECTRICAL** for additional telephone system requirements.

8.9 CABLE TELEVISION SYSTEM

The Midcontinent Cable TV Company will design and install the exterior CATV cables, pedestals, and connections to the new housing units. Point of contact: Terry Hofer (605) 342-1870 ext 123.

a) The removal and relocation of the cable TV lines and equipment shall be coordinated with Ellsworth AFB and Midcontinent. The cable TV system shall be located underground in the rear of the housing units and installed in the same trench as the electrical distribution and telephone systems. The Contractor shall be responsible for assuring that cable TV, power, and telephone layouts are thoroughly coordinated and that they are installed in accordance with all codes, regulations, requirements, and specified clearances. The service entrance shall be located in the “mechanical” room of the new family housing unit.

b) The existing local cable television provider is Midcontinent. The Cable Company will provide all of the exterior work up to the exterior terminal box of each family housing unit. The Contractor is totally responsible to ensure that this is accomplished and that cable for each family housing unit is provided. Contractor shall contact the local provider for cable television service requirements to coordinate the installation of the cable television system for the family housing unit. The Contractor is responsible for coordinating with and for ensuring that Midcontinent Cable TV Company receives whatever information and drawings required in doing the exterior cable TV system design. See **PART 14– UNIT DESIGN - ELECTRICAL** for additional cable television system requirements.

8.10 ELECTRICAL UTILITIES

The utilities are located at the back lot lines and are routed to each unit from the transformer or distribution pedestal. Mains for the each of the utilities are located along the side yards and cross under the streets to

the next block. The Contractor shall be responsible for the protection of these utilities. The Contractor is also responsible for coordinating with all utilities on details about demolition, installation and construction cost responsibilities. The Contractor shall be responsible for protection and avoidance of existing utilities and equipment. Any damage incurred shall be replaced and/or repaired at the Contractor's expense to the satisfaction of the Contracting Officer.

a) Electrical, telephone, and cable TV shall not be installed in the same trench as water, gas, or sewer. Trenches shall be of the necessary width for proper installation of cables. Where cable crosses under roads or other paving exceeding 5 feet in width, such cable shall be installed in conduit by boring under the pavement. Conduit or pipe shall extend at least 10 feet beyond each side of the edge of paving. Where cables cross, a separation of at least 3" shall be provided and the cables shall be protected by conduit sleeves at the crossing. The radius of bends in cables shall not be less than 10 times the diameter of the cable. In no case shall cables be left under longitudinal tension. The first layer of backfill shall be of sand or stone-free earth. All disturbed areas of sod shall also be restored to the original condition. Direct burial cable shall be centered in an entrance to a conduit or duct line.

b) Separation of utilities shall be per the National Electrical Safety Code, and other applicable codes.

c) The Contractor shall coordinate the installation of electrical, telephone, and cable TV cabling to minimize the time the trench is open.

d) The Contractor shall provide complete calculations for the entire electrical design during the 100% design phase, after award of the contract. As a minimum, provide calculations for the transformer sizing, voltage drop on the service entrance cables, circuit breaker sizing, electrical loads, short circuit ratings, and area lighting. The Contractor shall coordinate with the Ellsworth AFB for electrical system fault current value.

e) The Contractor is responsible for (i) the phasing of the demolition of the existing electrical, telephone, and cable TV service drops to existing housing units, (ii) any temporary fixes required to minimize disruption of services to surrounding areas, and (iii) the phasing of the installation of the new underground electrical, telephone, and cable TV services to the new family housing units. The Contractor shall coordinate with the Midcontinent Cable TV company to: (i) plan the phasing of the demolition, (ii) design the temporary fixes to insure minimal disruption of electrical, telephone, and cable TV services to the surrounding areas, and (iii) plan the phasing of the installation of the new underground services.

f) Power Outages shall be kept to a minimum amount of time. The Contractor shall notify the Contracting Officer, in writing, of his intention to take outages. Such notification shall be given 7 days in advance of his intended outage. Any anticipated blocking of roadways, parking areas etc. shall also be covered in the request. Lines may be de-energized for a maximum of 6 hours at a time unless longer outages are approved in writing. Written notification does not guarantee approval of the outage as requested; however, the Government will make every attempt possible to grant the Contractor's requested outage. No outage will be granted when the ambient temperature is below 40 degrees F. In addition to other safety codes and manuals stated in this contract, work must be performed in accordance with OSHA standards.

g) It shall be the responsibility of the Contractor to seal any and all of his conduits passing through all floor slabs, exterior walls, mechanical room walls, and ceilings for the purpose of sound and moisture control.

h) All disconnect switches, motor switches, and other electrical equipment shall be permanently identified with engraved plastic nameplates. Hand lettering and embossed tape is

unacceptable. All pull and junction boxes shall be marked as shown below by means of stenciling or adhesive backed vinyl. Panel DP, Circuit #2

8.11 CATHODIC PROTECTION

A sacrificial anode cathodic protection system shall be provided for all underground metallic lines (including sewer, water, gas 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. Conductors shall be exothermically welded to the structure. 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, blue for reference cell, and white for a second structure. Besides color-coding provide plastic tags on the terminal or cable. Each test station shall be provided with a unique identification number on the drawings for future reference.

In addition, all metallic pipes must be provided with a coating system. The cathodic protection system shall be designed for a life of 25 years, use two bonds across each ductile iron pipe joint, use a current density of 2.0 mA/sq-ft), and use 10% for the amount of bare metal at end of the life. The typical soil resistivity in the area is between 2,000 ohm-cm and 20,000 ohm-cm. Contractor shall verify the soil resistivity by taking a minimum of three 4-pin readings in the area. The reading shall be taken for the depth of the pipe(s) and shall be averaged. The highest quality magnesium anode shall be used. Criteria for determining the adequacy of protection shall be in accordance with NACE RP-0169 and shall be selected by the corrosion engineer as applicable. Design shall be in accordance with Cathodic Protection System, (Sacrificial Anode) - Specification SECTION 13110A and the requirements of this section. Test stations shall be flush-curb box mounted in 1' X 1' concrete pads. Anode wires shall be #12 AWG.

8.12 REQUIRED SITE ELECTRICAL DESIGN ANALYSIS

8.12.1 GENERAL

A licensed professional shall perform all design and calculations for the site electrical systems Engineer with experience in family housing, and shall be stamped as such. Provide a separate bound assembly of all the functional and engineering criteria, design information and calculations applicable to the project design. Organize in a format appropriate for review, approval and record purposes.

8.12.2 LOAD CALCULATIONS

a) Calculate the demand load for each pad-mounted distribution transformer by all the demand loads (minus the HVAC load), for each type of living unit connected to the transformer, and then multiply by the appropriate demand factor per NEC. Then the HVAC load and any site lighting are added to this figure to arrive at the transformer demand load.

b) Calculate the demand load for each phase of each circuit of the primary distribution system. The loads shall be computed using the same method as outlined for the pad-mounted transformers.

c) In addition to the complete load calculations required, provide a load summary table which group and identify each type of demand load calculated including pad-mounted distribution transformers and primary phases.

d) Voltage Drop (VD) calculations:

1) Select conductor sizes of primary feeders and calculate maximum footage for each phase of each primary circuit using a maximum allowable VD for each circuit.

2) Select conductor sizes of site lighting circuits and calculate the VD for each circuit (Maximum allowable VD = 3%).

8.13 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES

8.13.1 TRENCHES

The trench for water lines, sewers, gas or electrical lines shall be as recommended by the manufacturer of the pipe to be installed and in accordance with to UFGS SECTION 02316A Excavation, Trenching, and Backfilling for Utilities. In accordance with NFPA 24, new water mains and service lines shall have a minimum of 8 feet. Water, sewer, and storm drains shall be placed in separate trenches. Gas lines may be installed in the same trench as water lines provided the gas line is placed on a shelf at least 12 inches above and 24 inches to one side of the water line. The separate trenches shall maintain a minimum horizontal separation of 1-ft except where the bottom of the water line shall be at least 12-in above the top of the sewer. Sewers crossing above potable water lines shall maintain a vertical separation of 18-in and must be constructed of suitable pressure pipe or fully encased in concrete for a distance of 10-ft on each side of the crossing. If the sewer line is replaced by pipe bursting, the use of butt-fusion welded polyethylene pipe would qualify as a suitable pipe.

In cases where it is necessary for the utilities to cross-existing streets and sidewalks, the Contractor shall install lines by trenchless methods. Trenchless methods shall be used when an underground utility line crosses any undisturbed roadway, and in the opinion of the Contracting Officer, the pipe, cable, or duct can be safely and properly installed and backfill can be properly compacted in such sections. Excavation by open trench methods will not be allowed unless written permission is obtained and approved by the Contracting Officer. When open trench methods are approved, streets and sidewalks shall be sawcut and removed and replaced to match existing conditions. Bedding and initial backfill material shall be in accordance with the manufacturer 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, September 1996, Safety and Health Requirements Manual. Special attention shall be given to slopes that may be adversely affected by weather or moisture content.

8.13.2 PLASTIC MARKING TAPE AND MARKING WIRE

Warning tapes shall be installed directly above the pipe, at a depth of 18 inches below finished grade for areas that do not use trenchless method unless otherwise shown. Plastic marking tape shall be in accordance with to UFGS SECTION 02316A Excavation, Trenching, and Backfilling for Utilities. Where the utilities are installed using trenchless method, all "nonmetallic" line shall have #14 AWG TW (thermal-weather resistant) coated conductor installed over the pipe for the reception of a locator transmitter signal. The wire leads shall be brought up, identified and protected in valve boxes, on service risers or any other convenient location. The Contractor shall bare approximately two feet of wire at each terminal end for the transmitter connection and increased conductivity.

8.13.2.1 Gas Line Protection and Detection

Below grade gas lines shall be protected from possible future 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. In addition, an insulated No. 14 AWG copper locator wire shall be placed above, but not in contact with, all new polyethylene gas lines and run the length of the new lines. Wire shall be terminated within, and accessible from, the valve boxes. When connecting to an existing steel gas line, the wire shall be

exothermically welded to the existing steel line to maintain continuity between the new and existing systems.

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PART 9 – HOUSING UNIT DESIGN/CONSTRUCTION

INDEX

9 HOUSING UNIT DESIGN / CONSTRUCTION

9.1 GENERAL

This section provides the Architectural Housing Unit Requirements for the Replace Family Housing Project at Ellsworth AFB, SD. It also provides the guidance necessary to develop the designs and construct the housing units within the parameters of the housing unit requirements. Unit design for square footage shall be within the ranges specified in PART 1 – DESIGN AND CONSTRUCTION OBJECTIVES for the various type units in Task Order No. 1. Family housing units shall be one-story and/or two-story duplexes containing two-dwelling units. Three (3) and Four (4) bedroom units may be paired within the same duplex. Junior ENL (JENL) and Senior NCO (SNCO) units shall not be combined in the same duplex and shall not be intermixed on the same side of a street on any block of this housing project. As a minimum, one (1) floor plan for each (JENL and SNCO) of the three (3) bedroom units, one (1) floor plan for each (JENL and SNCO) of the four (4) bedroom units, and one (1) floor plan for each (JENL and SNCO) of the four (4) bedroom handicap accessible units shall be provided. Increases above the maximum NSF or GSF in Table 1-2 of PART 1 – DESIGN AND CONSTRUCTION OBJECTIVES are not allowed. Ellsworth AFB prefers one-story units for all housing unit types. If one-story units can only be accomplished for one rank (JENL or SNCO), then Ellsworth AFB prefers the one-story choice be for JENL housing units before selecting the SNCO units for one-story. If one-story design and construction is submitted for the JENL units, then all JENL units (3 and 4 bedroom) shall be designed and constructed as one-story units. The SNCO units will also be designed and constructed as either one-story or two-story, but not both. All handicap accessible units shall be one-story, four bedroom units and shall not be paired within the same duplex unit. See requirements herein.

9.1.1 NET FLOOR AREA DEFINITION

Net floor area is defined as the space inside the exterior and party walls. Net area excludes:

a) Exterior and party walls.

b) Half thickness of interior walls adjacent to excluded areas.

c) Utility and laundry rooms.

d) Interior and exterior bulk storage.

e) Washer and dryer closet (not to exceed 30 ft²).

f) Furnace, domestic water heater, and solar equipment spaces, if not located in a separate utility room.

g) Stairwells on each floor (including intermediate landings between floors).

h) Stair landings at each floor level above the first floor (not to exceed 10 ft² per floor).

i) Walls and interior spaces specifically designed for passive solar systems (other than required habitable areas).

j) Finished space under stairs with headroom less than 4-feet 6-inches.

k) Unfinished attic and crawl space space.

l) Patios.

m) Garages.

n) Increases required to meet accessibility standards (not to exceed 75 ft²).

o) Open or enclosed porches without heating, air conditioning, or interior-type finishes.

p) Allowable net area increases.

9.1.2 GROSS FLOOR AREA DEFINITION

Gross floor area is defined as all interior spaces (finished and unfinished) within the exterior faces of exterior walls and centerline of party walls (in multiplex units) of housing units with the following exclusions:

a) Carports and Garages.

b) Exterior Bulk Storage (detached).

c) Trash Enclosures.

d) Porches open or closed which are not heated or cooled and which retain the basic characteristic of a porch.

e) Terraces, Patios, Decks, Balconies, and Entrance stoops.

9.1.3 TECHNICAL CRITERIA AND STANDARDS

The Air Force Family Housing Goal is – "To house Air Force families in the highest quality, energy-efficient housing that supports the needs of the military family and reinforces a strong sense of community." The technical criteria specified herein and in the referenced standards represent the minimum design standards and material quality acceptable to support the achievement of this goal. Replace Family Housing Ellsworth AFB, SD is to be designed and constructed in accordance with the guidance provided in this RFP, the Air Force Family Housing Guide, the latest editions of the Codes and Standards listed in the Air Force Family Housing Guide, except that the 2000 International Residential Code shall apply in lieu of older equivalent codes, and local construction practices. The standards and documents referenced in this RFP are considered as part of this RFP (although they may not be physically attached). The Contractor is responsible for securing copies of these standards and documents, complete with revisions specified.

9.1.4 WHOLE NEIGHBORHOOD CONCEPT

The Whole Neighborhood Concept, explained in the Air Force Family Housing Guide, is intended to establish a neighborhood identity through compatible housing styles, architectural features and landscaping. For a further explanation of the design image, which is preferred by Ellsworth AFB, SD, see PART 1 – DESIGN AND CONSTRUCTION OBJECTIVES.

9.1.5 DESIGN CHARACTER

The general character of the neighborhood desired by Ellsworth AFB is a series of "Prairie Style" houses reminiscent of those designed by Frank Lloyd Wright and contemporaries of his. This is a style, which has had constant adaptation through today in various places throughout the country. It is also consistent with projects built at the base recently and is a natural choice for the prairie landscape of the region.

Design features characteristic of this style include, low-sloped hipped roofs, unbroken roof planes, deep overhanging eaves, dramatic horizontal lines, geometric detailing, low proportions, rows of casement windows, small high windows for indirect lighting, one-story projections, a raised central block or anchor, integrated terraces or balconies, flanking wings and a chimney at intersection of roof planes (fireplaces are prohibited). In addition to this the interior floor plans should be spacious, efficient, clean and open. Light fixtures and other exterior/interior design

elements shall also reinforce the design relationship of the “Prairie Style". Material features, which depending on the design utilized, that are consistent with the Ellsworth AFB "Prairie Style" Architectural scheme include, but are not limited to wood trim or sided with horizontal board and batten trim. Color schemes, through the use of contrasting bands or strips, shall also be utilized to further emphasis the “Prairie Style” Architectural Design scheme that is desired be Ellsworth AFB.

The design for the new housing units and there site layout should also strive to achieve some design compatibility with the new facilities at Ellsworth AFB that have also utilized the "Prairie Style" Architecture scheme in there design. It is hoped by doing so, that the base can begin to achieve a sense of unity in its facility design.

9.2 ACCESSIBILITY

The units designated to be accessible to the handicapped shall include access features in accordance with the referenced ADA standards (FED-STD-795 and ADAAG). The Accessible housing units shall be designed in such a way that they may be easily and readily adaptable to accommodate physically challenged occupants, if necessary, at time of occupancy. Readily adaptable units shall meet the requirements of FED-STD-795 Section 4.34.3, which means that for this project that requirements for, access, clearances, room sizes, bathroom layout, kitchen layout, laundry layout, doors and hardware, thresholds, adjustable height cabinets and work surfaces, closet shelving and closet rods, plumbing hookups, plumbing fixtures, tubs, showers, shower/tub seats, grab bars, grab bar support blocking, light switches, outlets, controls, door bells and the warning devices for the hearing and visually impaired shall be made at time of construction.

9.3 FUNCTIONALITY

Rooms shall be sized and arranged for efficient use, good circulation, and furniture placement. The distribution of space for food preparation living and dining, sleeping, bathing, halls, closets, and services should be balanced and should enhance the intended functions.

a) Habitable rooms shall not be used as halls for entry into a housing unit or for primary circulation within a housing unit.

b) Provide convenient access between garage and service area, and between kitchen and service area.

c) Do not use a sliding glass door as a primary housing unit access.

d) Indoor and Outdoor Integration.

Emphasize factors that enhance indoor and outdoor living. Consider size, layout and location of patios, balconies, yards, and features that encourage family use of outdoor areas.

9.4 MAINTAINABILITY

The design of housing units including the selection and specifying of exterior and interior finishes, equipment, appliances, and systems shall include consideration of maintenance ease and cost. Avoid products that require continuing maintenance at high cost.

9.5 FIRE PROTECTION AND SAFETY

Housing units will comply with the applicable National Fire Codes, including NFPA 101, Life Safety Code (which includes egress elements such as stairs, handrails, door widths, etc. except that stair risers shall be maximum 7-

inches high and treads minimum 11-inches long and stair headroom shall be a minimum of 6-feet 8-inches). Construction features will be provided in accordance with the 2000 International Residential Code (IRC).

9.5.1 FIRE RESISTANCE OF PARTY WALLS AND ROOF MATERIAL

Party walls shall extend without openings, from ground to the underside of roof sheathing. Provide firestops at floor, and ceiling or roofline. Provide Class A (ASTM E108, Standard Methods of Fire Tests of Roof Coverings) roof covering material throughout. Party walls (walls separating housing units) shall have the minimum fire-resistance ratings shown below:

a) Duplexes, one hour. With a minimum of 5/8-inches fire-rated gypsum wallboard both sides, full height to bottom of roof sheathing. All walls and ceilings in garages shall be taped, finished, and painted.

b) Townhouses, two hour. . With a minimum of 5/8-inches fire-rated gypsum wallboard both sides, full height to bottom of roof sheathing. All walls and ceilings in garages shall be taped, finished, and painted.

9.5.2 HEATER/MECHANICAL ROOMS

Rooms equipped with fuel-fired equipment such as a furnace and/or fuel-fired water heater that serve only one housing unit shall have walls and ceilings finished with a minimum 5/8-inch fire rated gypsum board or equivalent noncombustible material. Easy access to the furnace filter shall be provided; the filter shall not be located in the furnace enclosure.

9.5.3 WALLS BETWEEN GARAGE AND DWELLING UNITS

Provide one-hour fire rating for walls between garage and dwelling units in accordance with the requirements of NFPA 101 and the IRC.

9.5.4 ALARM SYSTEMS

Smoke detectors shall be provided within the housing unit and which sound an alarm only. Install at least one detector each outside of each sleeping area in the immediate vicinity of the bedrooms, as well as one inside each bedroom. For 2-story units, an additional detector shall be located in the living area or at the stairwell leading to the bedrooms. See Mechanical for carbon monoxide detector requirements.

- Rough-in for an audible-visual type smoke detection device shall be provided in addition to the required "hard-wired" smoke detectors for handicapped accessible units.

9.5.5 SECONDARY MEANS OF ESCAPE

Every sleeping room and living area shall have a secondary means of egress where required by and in accordance with NFPA 101.

9.6 SOUND ATTENUATION

9.6.1 TESTING

Certified proof-of-performance field tests will be conducted to demonstrate that the floor and wall systems as constructed provide the required sound isolation. Tests for air-borne sound shall be made in compliance with ASTM E336. Tests for impact sound shall be made in compliance with ASTM E1007. Testing of all prototype units and 5 percent of each type of all other units as randomly selected by the Contracting Officer is required.

a) Any wall or floor system found to be inadequate shall have the deficiencies corrected and the additional qualifying tests conducted at the Contractor's expense. Testing at the Contractor's expense of greater than 5 percent of each unit type plus the prototype units may be required if the Contracting Officer determines that the quality of construction requires this additional testing.

b) Walls and floor ceiling systems shall be designed to meet or exceed the requirements stated below. In cases where the field tested performance of the systems does not meet the designed performance, the maximum acceptable difference between field tests and sound transmission ratings shall be 2 decibels (dB) for airborne sound ratings and 5 dB for impact sound ratings.

9.6.2 EXTERIOR WALLS

Exterior wall assemblies shall be designed for a noise reduction from outside to inside of 25 decibels.

9.6.3 PARTY WALLS

Party walls (walls separating adjacent dwelling units) shall be designed to provide the minimum airborne sound transmission ratings and impact isolation ratings stated in Table 9-2. Sound insulation shall have a flame spread rating of 25 and a smoke development rating of 50 or less when tested in accordance with ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.

TABLE 9-2 - SOUND TRANSMISSION STANDARDS
FOR PARTY WALLS

Area	FSTC[1]	FIIC[2]
Party Walls (except none at party walls between garages)	52	65

Note[1]: Field Sound Transmission Class. See ASTM E336. Ellsworth AFB prefers FSTC 60.

Note[2]: Field Impact Isolation Class. See ASTM E1007.

9.6.4 PLUMBING AND HVAC EQUIPMENT

Design of plumbing and Heating, Ventilating and Air-Conditioning (HVAC) equipment shall include design provisions such as location, enclosure and acoustical treatment, to minimize transmission of noise generated by equipment within each housing unit and to eliminate transmission of noise to other housing units.

9.7 DIMENSIONS AND AREAS

9.7.1 MINIMUM AREAS

Requirements stated in this RFP are minimums, except where maximum sizes are identified for the housing unit net and gross floor areas, number of housing units per building, and the interior/exterior bulk storage spaces (or other areas indicated as maximum). Innovative, creative, or cost-saving proposals that meet or exceed these minimum requirements (maximum requirements cannot be exceeded) are encouraged and will be viewed favorably in the evaluation process. Existing housing plans or modifications thereof that meet the design and construction criteria specified herein, that an offeror has previously constructed and priced, may be submitted. They may include designs incorporating factory-fabricated components or modules. Deviations from space and adjacency requirements are discouraged unless the changes result in clear improvement to the facilities. Sections that describe products by particular type or by reference to industry standards are intended to demonstrate the Government's minimum requirements for that area of work. Where minimum standards are not indicated herein, the guidelines provided in

the Air Force Housing Guide (December 1995) define the minimum acceptable standards and the objectives to be met. Where the Air Force Family Housing Guide allows options, the Contractor shall use the most beneficial option given.

9.7.1.1 Interior/Exterior Spaces

Minimum areas/dimensions for interior spaces are shown in Table 9-3. Minimum areas/dimensions for exterior spaces are shown in Table 9-4.

TABLE 9-3 - MINIMUM AREAS AND DIMENSIONS - INTERIOR SPACES

Space	Area	Width	Depth	Height[1]
	ft^2	ft-in	ft-in	ft-in
Living[2, 9]	150	11-8	11-8	8-0
Dining (2/3 BR)[2, 9]	90	9-6	9-6	8-0
Dining (4 BR)[2, 9]	110	10-6	10-6	8-0
Family Room[2, 9]	90	9-6	9-6	8-0
Kitchen[3, 7, 9]	64	8-0	8-0	8-0
Eating in Kit.[4, 9]	72	8-6	8-6	8-0
Refrigerator & Freezer[9]	6	3-0	2-0	8-0
Washer/Dryer[5]	54	6-0	3-0	8-0
BR #1[9]	150	11-8	11-8	8-0
BR #2[9]	120	10-0	10-0	8-0
BR #3[9]	100	10-0	10-0	8-0
BR #4[6, 9]	90	9-6	9-6	8-0
Half Bath[7]	-	-	3-0	8-0
Full Bath[7]	-	-	5-0	8-0
Crawl Space	-	-	-	3-8
Hall & Stairway[8, 9]	-	-	3-3	8-0

Note[1]: Ceiling heights, except for the crawl space, for all enclosed spaces, including closets, storage spaces, garages, patios and porches shall be a minimum of 8-ft 0-inches. Ceiling heights cannot be reduced in any part of these spaces to accommodate ductwork, electrical, plumbing runs, or for any other reason.

Note[2]: Room dimensions are exclusive of circulation. Circulation paths along one side of a room are permitted but add 3-ft 3-inches to the minimum dimension.

Note[3]: A minimum of 4-ft must be maintained in front of and between cabinets.

Note[4]: Minimum area and dimensions are measured from face of cabinets to walls.

Note[5]: Minimum area and dimensions are indicated for a washer and dryer closet. This area may also be provided in a utility room. When so provided, area and dimensions are exclusive of circulation.

Note[6]: Bedroom #4 area being larger than 90 ft^2 is preferred by Ellsworth AFB.

Note[7]: Accessible units must conform to UFAS, which requires greater minimum dimensions.

Note[8]: Clear width is measured between railings.

Note[9]: Finished ceilings in this space may be sloped or vaulted, but at no point shall the ceiling height be less then the minimum height as noted in Table .9-3.

TABLE 9-4 - MINIMUM AREAS AND DIMENSIONS - EXTERIOR SPACES

Spaces	Area	Width	Depth	Height[1]
	ft^2	ft-in	ft-in	ft-in
1 Car Garage	282	12-8	22-4	8-0
2 Car Garage	465	20-10	22-4	8-0
Balconies	72	6-0	6-0	8-0
Patios	120		8-0	8-0
Porch				8-0

Note[1]: Ceiling heights apply when patios and balconies are covered.

Note[2]: If a porch is part of the architectural style of a home and functions as an integral part of the entry of the home through the front door, with no separate access from the interior of the home to the porch, then the porch does not count as outdoor living space.

9.7.1.2 Kitchen Cabinets, Counters and Pantries

See Table 9-5. Flat area is shown for countertops and drawers. Combined shelf area is shown for pantry and base, wall and wall cabinets.

TABLE 9-5 - KITCHEN CABINET, COUNTER, & PANTRY AREA

Type of Housing Unit	Wall	Base	Drawer	Counter	Pantry
	ft^2	ft^2	ft^2	ft^2	ft^2
2/3 BR	24	32	14	12	-
4 BR	30	40	18	16	16

9.7.1.3 Closets

Minimum closet width requirements are stated in Table 9-6.

TABLE 9-6 - MINIMUM CLOSET WIDTHS[1]

Type of Unit	JENL	SNCO
	ft	ft
Coat/ Entry[4]	3	4
Master BR #1[2, 4, 5]	6	6
BR #2[4]	4	4
BR #3[4]	4	4
BR #4[4]	4	4
Broom	3	3
Linen[3]	2	3

Note[1]: Minimum inside clear depth for closets other than linen closets shall be 2-ft.

Note[2]: Walk-in closets are preferred.

Note[3]: Minimum clear inside linen closet depth shall be 1-ft 6-inches.

Note[4]: In handicapped units clothes closet shelving, shall meet the requirements of FED-STD-795 Section 4.25. and they shall be made adaptable, for standard and handicapped use at time of construction.

Note[5]: In the bathroom off the Master Bedroom of handicapped units a handicapped accessible shower shall be provided, which meets the requirements of FED-STD-795.

9.7.1.4 Bulk Storage

Minimum requirements for interior, exterior, and combined bulk storage are shown in Table 9-7. Unit designs that provided the maximum allowed Interior and Exterior Bulk Storage square footages are preferred by Ellsworth AFB.

TABLE 9-7 - MINIMUM INTERIOR, EXTERIOR, & COMBINED BULK STORAGE[1]

Type of Unit	Type of Storage	Minimum ft^2	Maximum ft^2
2 BR	Int.	24	70
	Ext.	24	70
3 BR	Int.	24	80
	Ext.	24	80
4 BR	Int.	30	100
	Ext.	30	100

Example[1]: If interior bulk storage is 24.75 ft^2, then exterior bulk storage must be 45.2 ft^2 to obtain the combined bulk storage requirement of 70 ft^2. Minimum depth of any bulk storage is 4-ft.

9.8 MAJOR ZONES

9.8.1 LIVING AND DINING

The living room should have direct access to the front entrance and to the dining area without passing through another room. When circulation is required along the perimeter of the space or between areas in open plans, minimum circulation space of 3-ft 3-inches shall be added to the required minimum room dimension.

a) The dining area may be an extension of, or an "L" off the living room.

b) The dining area shall be directly accessible from the kitchen without passing through another room.

9.8.2 KITCHEN AND AUXILIARY DINING AREA

a) The kitchen shall provide an efficient work triangle. A base cabinet, minimum 15-inches wide, shall be provided on the handle side of the refrigerator. The range shall not be located adjacent to the refrigerator, in a corner, adjacent to a passageway, or under or within 1-ft. either side of a window opening. The dishwasher shall be installed adjacent to the kitchen sink. Provide a back splash behind the range, extending to the underside of the range hood, finished to match the countertop or range and the range hood. Space for a tenant-owned upright freezer shall be provided adjacent to the kitchen or in area such as the laundry or utility room with direct access to the unit. Freezer area shall not be located in the garage. A Separate shelf for a tenant-owned microwave oven with a dedicated outlet and circuit shall be provided in the kitchen.

b) Provide a snack bar counter integral with the kitchen counter. The snack bar area shall be located to the adjacent room side of the kitchen in either a dining room or family room as appropriate for the unit layout. The snack bar area shall not be located in a corridor or living room.

c) In the kitchen, shoe molding (1/4 round) is required at all base cabinets where they meet the floor surface.

9.8.3 FAMILY ROOM

Provide a separate family room, for all three-bedroom and four-bedroom units.

9.8.4 BEDROOMS

Bedrooms shall be designed to accommodate king-size beds in master bedrooms and twin beds in the other bedrooms. Window, door, and closet placement should enhance furnishability. Each bedroom shall be accessible without passing through another bedroom. Design consideration shall be given to the movement of oversized furniture in and out of the bedrooms.

9.8.5 CRAWL SPACE

Except for garages, no portion of the living unit shall be constructed as slab on grade. A crawl space, which extends to a minimum depth of 3-feet below grade shall be provided for all units. See Table 9-3 for the crawl space ceiling height, which shall be measured from the bottom of floor joists to the top of floor slab. Crawl spaces shall be mechanically conditioned. Access to the crawl space shall be provided from within the living unit. Ellsworth AFB prefers access to the crawl space from either the mechanical or utility room through a hinged floor access panel that shall be a minimum of 24-inches by 36-inches in size (hinges shall be tamper resistant).

The access panel and frame assembly shall be able to support a 300 psf live load, shall be equipped with a flush steel drop handle that does not protrude above the cover and a stainless steel hold open arm with red vinyl grip that automatically locks the cover in the 90 degree open position. When in its closed position the access panel shall not be provided with any type of locking mechanism. Access panel shall be provided with a flush cover finish material that matches the adjacent flooring.

Mechanical requirements and access for the crawl space shall be in accordance with the 2000 International Residential Code. Crawl space floors shall be provided with concrete flooring. See Structural requirements for further information.

9.9 MINOR ZONES

9.9.1 BATHROOMS

Emphasis shall be placed on size, furnishings, layout, and privacy. Direct access to a bathroom from the master bedroom is required for three -bedroom and four-bedroom units. Compartmented bath design, for family and guest use, is encouraged. Determine the number of bathrooms based on Table 9-8.

TABLE 9-8 - BATHROOM REQUIREMENTS

Number of Bedrooms per Floor	Number of Bathrooms per Floor
None	0.5
1 – 2	1
3 – 5	2[1]

Note[1]: If there are three bedrooms on a floor, not including the Master Bedroom, only one bathroom is required to

TABLE 9-8 - BATHROOM REQUIREMENTS

Number of Bedrooms per Floor	Number of Bathrooms per Floor

be shared by these bedrooms.

9.9.1.1 Full Bath

A full bath shall contain a water closet, lavatory, and a slip resistant combination one-piece heavy-duty fiberglass tub/shower surround assembly (tub/shower module) (Note: Tub/shower modules shall not be placed under windows). Tub/shower modules shall come complete with integral soap ledges and grab bars. The tub/shower modules shall be a minimum 60-inches in length, 31-inches in width and 71-inches in height. Tub/shower modules shall have a 17-inch sidewall and a minimum basin to overflow height of 10-inches. Heavy-duty tub/shower modules shall meet or exceed the requirements of ANSI Z124.1 and IAPMO/UPC and the tub/shower modules shall be installed in a bed of mortar.

Except for handicapped accessible units tub/shower modules shall be provided with a minimum 58-inches tall sliding tub/shower doors. The tub/shower door and frame assembly shall be corrosion resistant, prevent the passage of water and the frame shall direct water back into the tub and the glazing shall meet or exceed the requirements of ANSI Z97.1.

At partial bathroom locations where a shower in provided the shower enclosure shall be a combination one-piece heavy-duty fiberglass shower surround assembly (shower module) (Note: Shower modules shall not be placed under windows). Shower modules shall come complete with integral soap ledges. The shower modules shall be a minimum 48-inches in length, 36-inches in width and 76-inches in height. Heavy-duty tub/shower modules shall meet or exceed the requirements of ANSI Z124.2 and IAPMO/UPC and the shower modules shall be installed in a bed of mortar.

Except for handicapped accessible units shower modules shall be provided with a minimum 69-inches tall hinged or pivot type shower door. The shower door and frame assembly shall be corrosion resistant, prevent the passage of water and the frame shall direct water back into the shower and the glazing shall meet or exceed the requirements of ANSI Z97.1.

At least one full bath shall be provided in each family unit. One full bath in each housing unit shall be directly accessible from the bedroom hall without passing through another room.

A half bath contains a lavatory and a water closet.

In handicapped accessible units for tub/shower or shower modules, in lieu of shower doors, shower curtain rods and flanges shall be provided. In handicapped accessible showers and tubs a seat shall be provided, which meets the requirements of FED-STD-795. Shower curtains will be government furnished and government installed at time of occupancy.

9.9.1.2 Lavatories

All lavatories in bathrooms shall be mounted in countertops with vanity bases. Countertops shall be cultured stone and as a minimum, 2-ft. wide with 4-inch high back splashes against all walls. Plastic or Plastic Laminated particleboard countertops shall not be used in bathrooms. Vanity base construction shall comply with Kitchen Cabinet criteria and shall provide, as a minimum, 3 drawers as well as storage under the lavatory bowls. Vanities in units designated to be accessible to the handicapped shall be adaptable to alternative heights as required by UFAS.

As a betterment to cultured stone countertops, solid surface countertops with backsplashes that are scribed to fit with joints glued and sealed shall be provided in Bathrooms. Solid surface *material as manufactured by Corian is preferred by Ellsworth AFB.*

9.9.1.3 Accessories

Bathroom accessories may be surface mounted or recessed, of stainless steel metal, and shall include a recessed toilet paper holder, recessed combination soap dish and grab bar at tub/shower stall, two bathrobe hooks, and two towel bars, totaling not less than 42-inches in length for a full bath, or one or two towel bars not less than 30-inches in length for a half bath. In units that are provided with shower rods the rods and flanges shall be stainless steel metal. A recessed medicine cabinet shall be provided in each bathroom. Cabinets shall be corrosion-resistant with plate glass mirrors and hinged type door. Medicine cabinets with sliding doors are prohibited. Do not place recessed medicine cabinets in party walls. In handicapped accessible units an additional medicine cabinet shall be provided that is accessible. As such it shall be located with a usable shelf no higher than 44-inches above the floor. Stainless steel shall be type 304. Wall brackets shall be solid cast or forged or sheet steel that incorporates a hook system perpendicular to the wall. Provide solid wood blocking (wood 2 x 4 minimum) behind all wall-mounted accessories

9.9.1.4 Exhaust Fans

Exhaust fans shall be provided in all bathrooms. Exhaust fans shall be switch operated separately from the lights and shall be ducted directly to the exterior of the building. (see paragraph 13.6. for additional requirements).

9.9.2 LAUNDRY WASHER AND DRYER

Laundry Washer and dryer space shall be in a separate utility room, except in two-bedroom units, where the space may be provided in an enclosed recess off the hall. Coordinate location of laundry room/dryer to assure compliance with dryer vent requirements specified in Mechanical Section.

9.9.2.1 Shelves

As a minimum two full-length shelves, 10-inches minimum nominal depth, are required above the washer and dryer. However Ellsworth AFB prefers a full width cabinet over the washer and dryer. If cabinets are provided they shall match the kitchen cabinets.

9.9.2.2 Door Clearance

Minimum net clear door width to washer and dryer space when open is 2-ft 8-inches except 3-ft at handicapped units. Swing of doors shall not conflict with operational space in front of washer/dryer appliances.

9.9.2.3 Cabinets

A separate laundry room with a full width cabinet over washer and dryer is required. All cabinetry in the laundry room shall match the kitchen cabinets.

9.9.3 CLOSETS

Closets shall provide the minimum widths indicated in Table 9-6.

A broom closet shall be provided convenient to the kitchen, and a coat closet shall be located near the front entry.

9.9.3.1 Closet Shelving

Bedroom closets shall maximize closet space with vinyl covered organizers and shelving. As a minimum, provide 2 rods and 2 shelves in 50 percent of the hanging space with shelves at approximately 3-feet 8inches and 6-feet 10-inches above floor. The remainder of the hanging space shall have one rod and one shelf. Linen closets shall be provided with at least four full-depth shelves. Closet shelving and rods in excess of 4-ft shall have center supports.

Shelves and supports shall be capable of carrying 35 lbs./ft. For all closets ensure more than adequate structural support since it is common to overload shelving and hangar rods. In handicapped units clothes closet shelving, shall meet the requirements of FED-STD-795 Section 4.25. and they shall be made adaptable, for standard and handicapped use at time of construction.

9.9.4 BULK STORAGE

Provide each housing unit with interior and exterior bulk storage space meeting the minimum requirements of Table 9-7. A separate room shall be provided for interior bulk storage. A separate storage area for the trash containers shall also be provided for in the garage. The trash container area shall be large enough to hold two standard garbage cans, one recycle container (18-nches W x 26inches L x 14-inches D), and one 90-gallon yard waste container (3-feet W x 4feet L x 3-feet 6-nches D).

a) Bulk storage space should be at least 4-ft in depth and a minimum clear height of 8-ft 0-inches, except that space under stairs may be counted at 1/2 area if the space is 4-ft or more in height.

b) Provide a minimum of three nominally 12-inches deep shelves with a combined length of 24-ft within each bulk storage room (both exterior and interior).

c) Common walls and ceilings between adjacent storage areas shall be finished on both sides.

9.9.5 COAT CLOSET

a) A Coat Closet with shelf, clothes rod, and bi-folding doors for full-length usage shall be provided adjacent to the unit's main entry door. Coat Closet minimum depths and widths shall be as indicated in Table 9-6.

9.9.6 FOYER

This space is to complement the design character of the home and provide a transition between the front entrance and the interior of the living unit. The units should display a strong sense of entry to provide a transition between the exterior and the interior.

9.9.7 PORCH

It is preferred that a porch, which is an integral part of the front entry be provided for each living unit. This porch should be an integral part of the architectural style of the home and it should provide a transition between the front entrance and the exterior of the living unit. In units designed to be handicapped accessible porches shall meet the requirements of FED-STD-795.

9.10 INTERIOR FINISHES

9.10.1 GENERAL

Design shall conform to the requirements and guidance provided in the **Air Force Family Housing Guide** and the **ACC Architectural and Interior Standards** in addition to the requirements listed in this document. The applicable information from the **Air Force Housing Guide and ACC Architectural and Interior Design Standards** has been incorporated into this section.

The color, texture and pattern selections for the finishes of the housing units shall provide a warm, comfortable, easily maintainable and functional environment for the occupants. Coordination of finish colors is necessary for a cohesive design. Interior walls, wood trim, doors and ceilings shall match Sherwin Williams, Dove White 1648.

Plastic laminates shall have patterns that are mottled, flecked or speckled with a mar-resistant finish, such as Formica's "Crystal" finish.

9.10.2 SUSTAINABLE DESIGN

The use of finishes containing recycled materials is encouraged if the prices and availability are reasonable, the product must meet all performance specifications and it shall not result in restricted competition.

9.10.3 WALLS AND CEILINGS

Walls shall be provided with minimum 1/2-inch gypsum wallboard, joints shall be taped and the surface shall have a knock down finish. Ceiling finish material shall be 5/8-inch gypsum wallboard, joints shall be taped and the surface shall have a knock down finish. Wherever framing is spaced over 16-inches O.C., gypsum wallboard shall be 5/8-inch thick. Drywall screws of the appropriate length shall be used for the attachment of all gypsum wallboard. Nailing of gypsum wallboard is prohibited. Water-resistant wallboard shall be used in wet areas such as bath, powder, and laundry rooms. See paragraph 9.9.1.1 for tub and shower enclosure finishes. The knock down ceiling finish as specified above shall be provided on ceilings in all living spaces except for the ceilings in the kitchen, laundry room, bathrooms or closets. Ceilings in kitchens, laundry rooms, bathrooms and closets shall be provided with an orange peel finish. Interior finish shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less when tested in accordance with ASTM E84. Gypsum wallboard finish levels shall be "4" for all activity spaces such as living rooms, halls or bedrooms, and level "3" for all utility spaces such as closets and utility rooms. These levels are as defined by Gypsum Association document GA-214-96, Recommended Levels of Gypsum Board Finish.

All receptacle boxes and electrical switches prior to gypsum wallboard taping shall be masked to prevent gypsum wallboard cement from entering electrical boxes or touching sheathing on electrical sheathed cable.

9.10.3.1 Kitchen and Eating Area Walls and Ceiling

Combined kitchen and eating rooms shall have the same type of wall and ceiling finishes.

9.10.4 ACCESS PANELS

Access panels shall be provided for the access of all plumbing fixtures including, faucets, valves, mechanical and electrical controls and other related items as identified in other Sections, which are concealed in the wall. Access panels shall be a standard manufactured item consisting of a flush door/panel of minimum 16-gauge steel, and a mounting frame of minimum 18-gauge steel. Minimum size shall be 12-inches by 12-inches, but shall be sized to allow access to, and for the removal and replacement of, the associated fixtures and controls. Access panels shall be finished to match the surrounding wall surface.

9.10.5 FLOORING, STAIRS AND BASE

For two story schemes, stairs, all bedrooms, living rooms and second floor halls are to be carpeted. For single story schemes, all bedrooms, bedroom halls, and living rooms are to be carpeted. Install sheet flooring to minimize need for seams. Where room size requires seams, apply waterproof epoxy adhesive continuously in all seams in accordance with the manufacturer's instruction. Provide extruded vinyl edge moldings where flooring materials change and where appropriate in open plans. Crawl space and garage floors shall be concrete with a sealant and steel toweled finish.

9.10.5.1 SHEET VINYL

Sheet vinyl shall conform to ASTM F1303, Standard Specification for Sheet Vinyl Floor Covering with Backing, Type II, Grade 2. Grade 1 minimum wear layer thickness of 3/64-inches and minimum overall wear layer thickness of 5/64-inches Flooring shall be installed as a monolithic material with seams welded or bonded for a seamless

installation. Where room size require seams, apply waterproof epoxy adhesive continuously in all seams in accordance with the manufacturer's instruction. Provide extruded vinyl edge moldings where flooring materials change and where appropriate in open plans. Sheet vinyl for dining rooms and family rooms shall match Armstrong Commission Plus, Lancaster Oak 80631 Golden Oak. Sheet vinyl in kitchen and bathroom shall match Armstrong Commission Plus, Autumn Park 8606 Park.

9.10.6 PAINTING

Interior surfaces which are to be painted, except factory prefinished material, shall be painted a minimum of one prime coat and two finish coats of latex paint. All painted surfaces in kitchens, baths, laundry and utility rooms, and all painted trim shall have semi-gloss finish. All other interior surfaces shall have satin finish. Interior doors, interior door trim and interior window trim shall be provided with a painted finish. Simulated acoustic finishes or paint finishes with a texture other then "knock down" are not permitted. Paint systems shall conform to the Architectural Specification Manual of Specification Services, Inc., Premium quality. Also see the Air Force Family Housing Guide paragraph 4.9 Interior Design.

9.10.7 CARPET

Carpet shall match Patcraft, Socrates II-28-10069, Sorel 69105. Use one carpet color only throughout the housing unit. Carpet shall be in accordance with Carpet Standard AF ETL 00-6. Carpet shall be woven, tufted or fusion bonded construction. Carpet type shall be loop or textured loop. Minimum face weight shall be 28 ounce. Synthetic (polypropylene) backing is required. A minimum pile density of 5929 and gauge of 1/8. Solution dyed yarn with a soil and stain resistant finish. Provide 3/8-inch to ½-inch high-density polyurethane foam underlayment that meets HUD Use of Material Bulletin 72A HUD Building Product Standard and Certification Program for Carpet Cushion. Carpet must pass the Department of Commerce (DOC) FF 1-70 Pill Test (7 passes from 8 specimens) and the requirements of NFPA 101, The Life Safety Code. 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. Tuft bind force required to pull a tuft or loop free from carpet backing shall be a minimum 10-pound average force for loop pile and 3-pound average force for cut pile when tested in accordance with ASTM D 1335. Carpet shall be installed according to the manufacturer’s recommendations to ensure that warranties will be valid.

9.10.8 PORCELAIN TILE

Ceramic tile shall conform to ANSI AI37.1, moderate to heavy grade only. Porcelain tile should be utilized in entryways, minimum size 8-inches x 8-inches. Porcelain tile and trim shall be unglazed with the color extending uniformly through the body of the tile and equal to Crossville Ceramics. A mottled or speckled floor tile should be used for maintenance purposes. A medium to dark toned grout, which coordinates with the floor tile, is required to avoid a stained or soiled appearance.

9.10.9 TRANSITION FLOORING STRIP

Provide a vinyl or rubber transition strip tapered to meet abutting material. Shall meet ADA requirements.

9.10.10 BLINDS

Vertical blinds shall be provided at patio door and at windows in living and dining spaces. Horizontal blinds are to be provided on all remaining windows. Blinds shall be in accordance with FS AA-V-00200, Rev. B., Type II. Slats shall be aluminum and not less than .0070 thick.

9.11 GARAGES

Provide an attached double car garage for each housing unit. Trash area in garage shall be in addition to the required car storage area. Refer to Table 9-4 for minimum dimensions. Slope slabs to drain out the garage door.

9.11.1 GARAGE DOORS

Garage doors shall be metal, sectionalized type in a 26-gauge minimum panel type “stile and rail” design, and shall be factory insulated and prefinished. Garage doors shall be provided with hardware that can be locked from inside and outside of the garage. A handle for opening the door shall only be provided on the inside of the door. Garage doors shall be insulated with a minimum R-Value of 7. Garage doors shall be a minimum of 9 feet wide and in the open position shall give a minimum clear height of 7-feet. Double garages shall have two separate doors. Garage doors shall meet the requirements of the DOOR AND ACCESS SYSTEMS MANUFACTURERS ASSOCIATION (DASMA) document ANSI/NAGDM 102, (1988) Sectional Overhead Type Doors, as defined for “residential” type doors. Suggested door manufacturers include Crawford Door Company, Overhead Door Company and Wayne-Dalton Corporation. Garage door provided shall be installed complete with all necessary tracks, mounting brackets, hardware and weatherstripping.

9.11.1.1 Door Opener

Provide an automatic garage door opener with closing protection, adjustable settings, two remote controls, and with a push button control on the wall near the door from the garage into the housing unit. An electrical outlet shall be provided for the garage door opener.

9.11.2 WALLS AND CEILINGS

Provide gypsum wallboard on the walls and ceiling with taped joints and mudded screw holes with a level "3" gypsum wallboard finish. Walls and ceilings shall be painted. A textured knock down finish is not required; however, it is preferred. The level of gypsum wallboard finish is as defined by Gypsum Association document GA-214-96, Recommended Levels of Gypsum Board Finish.

9.11.3 INSULATION

Garage walls and ceilings between the garage and the rest of the housing unit shall be insulated as if they were part of the exterior envelope (see Table 9-11). Exterior garage walls shall be insulated to provide and R-Value of 13 and the exterior roof/ceiling shall be insulated with an R-Value of 19. Exterior garage walls may utilize 2 X 4 wood stud construction provided thermal and structural requirements can be met.

9.11.4 GARAGE ACCESS DOORS

As a minimum provide one personnel door for ingress and egress from the garage leading directly to the exterior of each unit. Garage access doors shall not face the street. If the layout allows it, than it is preferred that at least one garage access door be provided which allows egress to the rear yard. Personnel doors leading from the garage to the exterior shall meet the requirements of secondary entrance doors.

9.12 ROOFING AND DRAINAGE

Minimum slopes for roofs shall be as shown in Table 9-9. The design shall have hipped end pitched roofs.

TABLE 9-9 - ROOF SLOPES

Roof Types	Rise	Run
Interlocking Fiberglass Shingles	4	12

9.12.1 ROOF WATER

Gutters and downspouts shall be provided for all roof areas. Provide continuous seamless gutters and downspouts, which are prefinished aluminum or galvanized steel. As a minimum, gutters shall be supported by spikes and ferrules at 36-inches on center. Downspouts draining onto a lower roof shall have metal or plastic splash deflectors. Downspouts draining to grade shall not discharge onto patios, door entry landings, sidewalks or other paved areas due to a safety concern with ice freezing on them. Downspouts that drain to grade shall be provided with 5-foot minimum extensions that empty onto precast concrete splash blocks, which are a minimum of 3-feet long.

9.12.2 ROOF SURFACE

Roofing shall be limited to the following:

a) Minimum of 220-pounds per square, Class A wind-resistant fiberglass shingles. Shingles shall be interlocking, conforming to ASTM D3018 Type 1 and ASTM D3161, Specification for Class A Asphalt Shingles Surfaced With Mineral Granules. Shingles shall have a minimum 30-year product warranty with a minimum 10-year wind resistance (blow off) warranty for a 90 mph wind rating and a minimum Class 4 impact resistance rating when tested in accordance with UL 2218.1. Shingles shall be fungal-resistant, 3 tab type, 13-1/4-inches by 39-3/8-inches long nominal size. Shingles shall have a minimum 5-inch exposure to the weather and shall be self-sealing. Shingles shall be applied over 30-pound, asphalt saturated roof felt conforming to ASTM D226, in combination with special purpose ice dam underlayment. Valleys shall be either woven or closed cut type and in addition to the 30-pound roofing felt and the special purpose ice dam underlayment shall be provided with a minimum 50-pound reinforced mineral surface rolled roofing as recommended by the shingle manufacturer. All roofing materials shall be by the same manufacturer or as recommended by the shingle manufacturer. In addition to the shingles installed, an amount of unbroken bundles of shingles shall be provided to the Government in an amount to equal 2 percent of the quantity of shingles installed. Ellsworth AFB prefers that Alaskan number 230 shingles as manufactured by Malarkey Roofing Products be used on this project.

b) To prevent ice damming on the roof, a special purpose, self-adhering rubberized membrane underlayment shall be used at ridges, eaves and valleys. Products that define a minimum level of acceptable quality for ice dam underlayment and that are recommended for use includes W. R. Grace and Water Shield underlayment.

c) Common roofs. Parapet walls are prohibited.

d) Patios need not be covered.

e) The roofing system shall be installed according to the shingle manufacturers instructions so as to validate the shingle warranty. A 30-year warranty against manufacturing defects that materially affect the performance for all roofing products and a minimum 10-year wind resistance (blow off) warranty for the shingles shall be provided.

f) In addition to the individual manufacturers product warranties a 10-year warranty against installation defects that materially affect the performance shall also be provided for the complete roofing installations. Installation defects shall be considered to include any application where precipitation produced water entering the facility, prescribed components for a complete assembly are discovered to be missing, components move from their place of application or visual flaws become visible due to incorrect installation procedures as defined by recognized application instruction documents of the manufacturer or the roofing industry.

9.13 EXTERIOR FINISHES AND THERMAL ENVELOPE

Emphasis shall be placed on low maintenance and durability for exterior finish materials. Materials shall be residential in size, scale, and texture. Exterior finish materials for garages will match the primary dwelling unit. Submit a minimum of 3 exterior color schemes in the light beige and gray earth tones range for all the dwellings. Each structure in turn should have a minimum of 3 colors, and a maximum of 4. The colors should be selected so that no two adjacent structures are colored alike, yet the selected colors of one should harmonize with its neighbors. For other exterior items, all building exterior corner trim, corbel and dentil trim, soffit and fascia, garage doors, window and garage head jamb and sill trim shall be white or a contrasting color to that of the rest of the dwelling unit. Material colors shall be submitted by the Contractor for approval by the Contracting Officer in accordance with Section 01332, SUBMITTALS DURING DESIGN.
Siding of the following materials shall be used:

9.13.1 FACTORY-PREFINISHED SIDING

Factory-prefinished siding shall have a minimum non-prorated 15-year warranty on the finish. Siding shall be kept a minimum of 6-inches above finish grade. Lap siding shall be either single pieces with 8-inches maximum width course or single pieces shaped to simulate 8-inches maximum width courses (double-four, double-five, triple-four sidings are acceptable for Steel Siding only). Siding shall be installed in accordance with manufacturer's recommendations. A manufacturer's representative shall instruct the installer of the siding, appurtenances, and accessories as to the manufacturer's required installation procedures. The Government construction inspectors responsible for the job shall be included in their instruction. Panel materials in large surfaces shall be avoided unless surfaces are broken with textures or battens. Battens for prefinished materials shall also be factory finished. Requirements for various siding materials are as follows:

9.13.1.1 Steel Siding

Steel siding material shall be a minimum of 0.017-inch thick (29-gauge), zinc-coated steel conforming to ASTM A526, Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality, and ASTM G90, Standard Practice for Performing Accelerated Outdoor Weathering of Nonmetallic Materials Using Concentrated Natural Sunlight. Siding panels shall be formed to provide full-length edge interlock, so that after installation, fasteners will be concealed from view. Fasteners shall be corrosion resistant and shall be driven into studs or solid wood blocking. Siding shall be pretreated and either factory-primed and finish-painted or factory-laminated with a weather-resistant polymer film. Steel siding materials shall be separated from aluminum surfaces with a coating of bituminous paint or asphalt varnish.

- Aluminum vinyl, and polyvinyl chloride (PVC) siding **shall not be used.**

9.13.1.2 Fiber Cement Board Siding

Fiber cement board siding material shall be a minimum 5/16-inch thick. The siding shall be installed in such a way as to keep vertical joints and material waste to a minimum. Horizontal banding shall be of the same material, with metal or cement board trim at exterior corners and flashing locations. A 50-year warranty against manufacturing defects that materially affect the performance shall be provided for the siding. The siding shall be factory primed and field painted according to the manufacturer’s recommendations. A high quality, exterior grade 100% acrylic latex topcoat that provides a 15-year manufacturer’s warranty shall be used on the siding. Products which define a level of acceptable quality and that are recommended for use include the “James Hardie” brand of products. Ellsworth AFB, SD prefers fiber cement board siding.

9.13.2 TRIM ELEMENTS

Metal trim shall be compatible with the roofing and siding materials. As a minimum level of quality exposed-to-view flashiness shall be of prefinished 26-gauge galvanized steel. Eave flashing shall be a minimum of 3-inches in width and formed according to “Style D”. Other flashings shall have a minimum vertical leg of 4-inches, a minimum horizontal leg of 6-inches or a minimum flat width of 7-inches. Roof and soffit vents shall be coordinate with other flashings. Products which define a minimum level of acceptable quality and that are recommended for use include those by Vincent Brass & Aluminum Company, ColorClad, Foremost Manufacturing Company,

Peterson Aluminum and Berridge Manufacturing Company. Where appropriate, flashiness shall be treated to protect them against corrosion.

9.13.3 PAINTING

Exterior surfaces requiring painting shall be kept to a minimum, but where painting is absolutely necessary, exterior surfaces shall receive a minimum of one prime coat and two finish coats of paint. Wood trim frames, etc., shall be back primed. Exterior semi-transparent stains, two coats, are acceptable, where appropriate for wood, plywood, etc. As a minimum paint systems shall conform to the Architectural Specification Manual of Specification Services, Inc., Premium quality.

9.13.4 SEALANTS

Sealants for exterior use shall be a one-component polyurethane type. Sealants for interior use shall be paintable and mildew-resistant. Products which define a minimum level of acceptable quality and that are recommended for use include the "Vulkem" line manufactured by Mameco, Sikaflex Corporation products or "Sonalastic" line manufactured by Sonneborn Corporation. Sealant shall be applied at all locations of purposely-designed joints, where natural construction gaps would otherwise occur between materials, or where differential movement of material elements can be expected. Application shall be according to the manufacturer's instructions, including the use of backer rods, primers, and bond breakers, where required.

9.13.5 EXTERIOR SOFFITS

Exposure of roof framing and underside of roof/floor decks are not permitted. Exterior soffits will be trimmed or otherwise architecturally treated and coordinated with siding. Exterior soffits shall be preformed and prefinished metal with non-vented and vented holes. Excess attic ventilation shall not be provided in using only vented panels. A combination of non-vented and vented panels shall be used. Vented panels shall be evenly spaced along the eaves on the South and East sides of the units. Soffit venting on the North and West sides of the units should be avoided so as to reduce the potential for snow infiltration. Cement asbestos ceiling or soffits are not permitted. For additional soffit and attic ventilation requirements see paragraph 9.13.13 ATTIC VENTILATION.

9.13.6 STUCCO

The use of any type of stucco, synthetic stucco or any type of Exterior Insulation Finish System shall be **prohibited** on this project, except when it is used as a decorative textured finish on above grade poured concrete foundation walls.

9.13.7 CONCRETE MASONRY UNITS AND/OR POURED CONCRETE FOUNDATON WALLS

Either poured concrete or concrete masonry units may be used as a foundation wall material. If concrete masonry units are used for the foundation wall, then split faced concrete masonry units shall be utilized for the exterior face of the wall that is exposed above grade, so as to provide a textured look to the exposed foundation. Likewise if poured concrete is used for the foundation wall, then a durable surface applied texture, such as an acrylic exterior finish system, shall be applied to the exterior face of the wall that is exposed above grade, so as to provide a textured look to the exposed foundation.

9.13.8 BITUMINOUS DAMPPROOFING MEMBRANE SYSTEM

A complete bituminous dampproofing membrane system shall be installed on the exterior foundation walls of unit crawl spaces and garage foundation walls. The bituminous membrane dampproofing system shall extend down the outside face of the foundation wall and shall provide continuous coverage to the bottom of the foundation footing base. At it's upper edge the bituminous dampproofing membrane system shall be terminated 2-inches below finish grade. At this termination point the bituminous dampproofing membrane system shall be fastened to the foundation wall with a continuous plastic termination bar that is mechanically fastened to the foundation wall with corrosion

resistant fasteners. The termination assembly shall be in accordance with the manufacturers recommendations and shall prevent the passage of water into the bituminous dampproofing membrane system. Products which define a minimum level of acceptable quality and that are recommended for use include those manufactured by W. R. Grace, Karnac, and W. R. Meadows.

9.13.9 AIR INFILTRATION CONTROL

The exterior wall finish selected shall be applied over an air infiltration building wrap, which in turn is applied over the wall sheathing. Air infiltration barrier shall be installed in strict accordance with the manufacturer's recommendations, including special treatment at window and door openings. Products, which define a minimum level of acceptable quality for the air infiltration barrier and that, are recommended for use include Tyvek's "Housewrap" line.

9.13.10 MOISTURE VAPOR CONTROL

Products manufactured to control the passage of moisture vapor (vapor barriers) from the interior of the housing unit to the exterior shall be provided and installed as a continuous envelope at the interior (warm side) of walls and ceilings. Vapor retarding membrane shall be 6 mil or heavier polyethylene sheet providing a "perm" rating of .02 or less. The installation, including treatment of seams and sealing of penetrations and tears of any kind, shall be according to the manufacturer's recommendations.

9.13.11 SILL SEALER

Sill sealer shall be used below all sill plated. Sill sealer shall be a manufacturers standard compressible foam product, which has been developed for the intended use. Sill sealer shall resist the passage of water and wind.

9.13.12 INSULATION

Perimeter insulation shall be 2-inches minimum thickness, extruded polystyrene and shall be placed on the exterior side of the bituminous dampproofing membrane system as a protection board for the bituminous dampproofing membrane system. Perimeter insulation in contact with the bituminous dampproofing membrane system shall be a product approved for such use by the bituminous dampproofing membrane manufacturer. Perimeter insulation shall be installed and protected in accordance with Manufacturer's recommendations. Products that define a minimum level of acceptable quality and that are recommended for use include the "Styrofoam" brand manufactured by Dow Chemical Corporation, the "Foamular" brand manufactured by Owens Corning, or the "Certifoam" brand manufactured by Diversified Insulation Corporation. Interior insulation may be utilized on exposed crawl space or foundation walls in addition to the required exterior perimeter insulation so that the thermal envelope requirements of the wall can be met for the full height of the wall. The interior insulation system for the crawl space or foundation wall shall be glued on foil faced extruded polystyrene board, which shall extend the full height of the interior face of the wall. Joist pockets in crawl spaces or at the top of foundation walls shall be insulated with foil faced batt insulation that is mechanically fastened in place. Stapling and gluing of gypsum wallboard is prohibited. Required R-Values shall be maintained equivalent to the exterior insulation system. Wall insulation shall be full-thickness-of-the-stud, unfaced batts. Roof (attic) insulation shall be, blown fiberglass or treated cellulose complying with U.L. class "A" flame spread rating. Safing insulation shall be 4-pound per cubic foot minimum density rock wool firestop material. Products which define a minimum level of acceptable quality and that are recommended for use include the such as the "Thermafiber" brand manufactured by USG Corporation, or the "Safing" brand manufactured by Fibrex, Incorporated. Ventilation baffles for soffits/eaves shall be of treated fiberboard, corrugated cardboard or molded polystyrene. Unit thermal insulation requirements shall be provided as indicated in tables 9-10 and 9-11.

TABLE 9-10 - WEATHER REGION DEFINITIONS[1]

Weather Region	Cooling Degree Days	Heating Degree Days	
	Range Base = 65 degree F		
5	< 2,000	> 9,000	< or = to 11,000

TABLE 9-11 – THERMAL CHARACTERISTIC REQUIREMENTS[1, 2]

Weather Region	Wall[3] R-Value	Ceiling /Roof R-Value[4]	Floor of Crawl Space R-Value[5]	Crawl Space Wall R-Value[6]	Slab on Grade R-Value[7]	Door U-Value[8]	Glazed Openings U-Value[9]	
							Window	Door
5	19 (12 at garage)	45 (19 at garage)	19	15	10	0.07	0.38	0.35

Note[1]: R-Values are in square foot-degrees F/BTUH. (R = 1 / U)

Note[2]: R-Values listed represent the minimum acceptable insulation values for each construction type. Listed U-Values represent the maximum thermal conductance allowed for windows and doors. Listed values do not include allowance for surface air films.

Note[3]: Requirements for opaque, exterior walls (all exterior walls of family unit, including between conditioned space and exterior space and between conditioned space and non-conditioned space (garage or exterior attached storage). R-Values in parentheses are the thermal values for garage walls or ceiling/roofs between non-conditioned space and exterior space.

Note[4]: For buildings with ventilated attics, no credit may be taken for the roof construction. R-Value shall be computed for construction between conditioned space and ventilated attic or building exterior. Insulation for floors that extend over outside air spaces shall conform to the ceiling and roof requirements.

Note[5]: This is also the requirement for crawl space exterior walls below uninsulated floors.

Note[6]: Requirements for crawl space wall insulation shall extend downward from outside finished grade to below crawl space floor slab and shall also provides full coverage of the bituminous dampproofing membrane system. Regardless of the R-Value, for protection of the bituminous dampproofing membrane system, insulation thickness shall be 2-inch minimum thickness with a minimum R-value of 10. Insulation above concrete foundation wall shall be as according to that for walls.

Note[7]: Requirements for perimeter insulation (including perimeters of walls and slabs at garages). In Weather Regions 1 through 6, perimeter insulation as a minimum shall extend 48-inches below grade or if the crawl space slab is lower down to the bottom of the slab and then in either case horizontally beneath the slab to a total distance of 48-inches.

Note[8]: Requirements for opaque doors in exterior walls (insulated metal and wood core).

Note[9]: Windows shall be energy-efficient (insulating type, low E glass, double pane). Glazed openings shall have U-Values rated by the National Fenestration Rating Council (NFRC). Glazing area in Weather Regions 3 through 11 shall be limited to 14 percent of the heated floor space.

9.13.13 ATTIC VENTILATION

"Attic roof and soffit ventilation shall be provided. The preferred method for providing ventilation of the attic space is with the use of low-profile metal vents with baffles on the roof surfaces, which are not exposed to view from the street side of the units, in conjunction with ventilated soffits. All roof and soffit venting shall be designed to keep rain and snow from entering the attic and it shall be provided with insect screening or a filter system to prevent the entrance of insects. Attic roof vents shall be of all metal construction, low profile, and shall be self-flashing to insure leak-proof installation. Attic ventilation shall be sized and uniformly spaced to provide 1/150 total net clear opening ventilation area of the total attic area. Attic ventilation areas shall be increased accordingly for screens and louvers so as to provide the required clear opening ventilation requirements. Soffit ventilation shall be 60% of the total attic ventilation with the remaining 40% of the attic ventilation being provided by roof ventilation. The Contractor shall coordinate the inlet and outlet areas available for attic ventilation with his or her architect to insure proper airflow. For additional exterior soffit requirements see paragraph 9.13.5 EXTERIOR SOFFITS."

9.14 GLAZED OPENINGS

Windows and glazed door (50 percent or more glass) units shall meet the following standards and must be certified by an independent testing laboratory. Operable windows shall be casement type. Standards for casement windows shall also apply to fixed windows. Glazing for windows at bathrooms shall be patterned or obscured. Safety glazing shall be provided where required by 16 CFR 1201, Safety Standard for Architectural Glazing Materials, and safety glazing shall comply with ANSI Z97.1. The Contractor shall provide the manufacturer's certification that the windows/glazed doors provided meet the following test requirements:

9.14.1 REQUIRED TESTS

Casement windows will meet NFRC design pressure rating of DP 40. Higher standards are preferred by Ellsworth AFB. Evidence of passing the following specific tests and minimum standards are required to achieve these design pressure standards.

9.14.1.1 Structural Testing

Using ASTM E330 test results shall demonstrate no glass breakage, damage to hardware, or permanent deformation that would cause any malfunction or impair the operation of the unit. Residual deflection of any member shall not exceed 0.4 percent of its span. Casement windows shall be tested at pressures of 60.0 lb/ft^2.

9.14.1.2 Operating Force

The force necessary to unlatch and open units shall not exceed 35 lb. for casements.

9.14.1.3 Air Infiltration

Using ASTM E283 leakage rate shall not exceed 0.15 $ft^3/min/ft^2$ for casements, at a test pressure of 1.57 lb/ft^2.

9.14.1.4 Water penetration

Using ASTM E547, no leakage shall be evident when tested in three, five-minute cycles with a one-minute rest period between cycles at 6.0 lb/ft^2 for casements.

9.14.1.5 U-Value

Whole window U-Values shall comply with Table 9-10 and 11. U-Values shall be calculated using ASTM E1423 and NFRC 100-91.

9.14.2 UNIT EFFICIENCY

Glazing units shall be high efficiency, low E, double-glazed with insulated glass with a minimum 1/2-inch air space and thermal-break with 10-year warranty. A low conductance spacer shall be used between the double- pane glass. Insulating glass units shall comply with ASTM E 773 and ASTM E 774, and shall be warranted by the manufacturer to be free of fogging or film formation on the internal glass surfaces caused by failure of the hermetic seal for a period of 10 years. Provide sashes that can be site glazed.

9.14.3 GLAZED DOORS

Glazed doors shall have insulated steel, vinyl clad wood or thermally broken aluminum frames conforming to the above requirements. Finish shall be factory applied and conform to 44-C-22431 in accordance with the requirements of the National Association of Architectural Metal Manufacturers (NAAMM) Metal Finishes Manual. Doors shall have interior operated latch, and securing pin or throw-bolt in frame.

9.15 WINDOW UNITS

9.15.1 INTERIOR WINDOW TRIM

Interior side of windowsills and trim shall be clear hardwood suitable for painting. Jamb extensions may be clear pine suitable for painting to match the interior window trim. Wood window trim shall have joints glued and pinned.

9.15.2 WINDOW UNITS

Windows shall be aluminum clad wood or vinyl clad wood conforming to AAMA/NWWDA 101/I.S. 2/NAFS-02, with fully mitered fusion welded joints at vinyl frames and reinforced with aluminum extrusions or roll-formed galvanized steel members if required. Frame finish shall be baked enamel to match window frame. Provide all hardware necessary to install, operate, tightly close, and securely lock windows. Provide a flexible polyvinyl chloride material compressed between frame and sash on all four sides as applicable, and a secondary weather-strip between frame and sash, stainless steel pivot arm, and copper and nickel alloy operating hardware and locks. Casement windows which meet the requirements herein shall be provided. All hardware necessary to install, operate, tightly close, and securely lock windows shall be provided. Each room shall have an operable window to the greatest extent possible. Windows in bedrooms must be sized to meet Life Safety egress requirements. Window units shall meet the requirements of AAMA/NWWDA 101/I.S. 2/NAFS-02 as specified below, except maximum air infiltration shall not exceed 0.15 CFM per linear foot of sash crack when tested under a uniform static air pressure difference of 1.57 psf when tested in accordance with ASTM E 283. Water penetration shall not exceed the amount established by AAMA/NWWDA 101/I.S. 2/NAFS-02 for each window type when tested in accordance with ASTM E 547. Structural stability shall comply with ASTM E330. Manufacturers whose products provide an acceptable level of quality for the windows and are preferred by Ellsworth AFB for use on this project include Anderson, Marvin and Pella.

9.15.3 CASEMENT WINDOWS

Windows shall be Type C, Performance Class R, Performance Grade (Design Pressure) DP40 with a minimum Structural Test Pressure of 60 as per the requirements of AAMA/NWWDA 101/I.S. 2/NAFS-02. Ventilator sashes, which swing on side jambs, shall have locking devices to secure ventilators tight in the frame in the closed position. Operator shall be rotor-type. Operating hardware except ventilator arms and rotary operators shall be concealed within frame and sill.

As a betterment to aluminum clad or vinyl clad wood window frames the contractor shall provide extruded anodized aluminum window frames, which meet or exceed the window performance requirements noted herein.

9.16 SCREENS

Screens shall be provided at all operable sashes. Screens shall be of window manufacturer's standard design, charcoal color vinyl coated 18/16 mesh fiberglass screen cloth with bronze finish aluminum frames, complete with all necessary hardware. See paragraph 9.17.2 for screen at combination storm doors.

9.17 DOORS

See Table 9-10 and 9-11 for thermal performance requirements of exterior doors. See paragraph 9.18 for door hardware.

9.17.1 MAIN ENTRANCE DOORS

The housing unit primary entrance door shall be 3-ft width by 6-ft 8-inches in height by 1-3/4-inch thick, insulated, pre-finished solid core metal door or metal clad solid wood construction, and shall meet applicable flame and smoke rating requirements, in a panel type "stile and rail" design. Metal doors shall conform to ASTM E-152, NFPA 252, and IRC. Metal doors shall have edges formed to give maximum rigidity and shall contain top and bottom horizontal stiffeners. Products which define a level of acceptable quality and that are recommended for use include those by Lake Shore Industries, Peachtree Doors, Pease, or Stanley Company.

Sidelights at main entrance doors are considered a betterment.

9.17.2 SECONDARY ENTRANCE DOORS

All secondary entrance (swinging) doors and doors between garages and living units shall be 3-foot wide by 6-feet 8-inches in height by 1-3/4-inches thick of metal (foam filled) or metal clad solid wood construction and shall meet applicable flame and smoke rating requirements as needed in a panel type "stile and rail" design. Exterior bulk storage doors shall be 3-foot wide by 6-feet 8-inches in height by 1-3/8-inches thick hollow metal flush type. Metal doors shall conform to ASTM E-152, NFPA 252, and IRC. Metal doors shall have edges formed (1-inch min. thickness) to give maximum rigidity and shall contain top and bottom horizontal stiffeners. Products which define a level of acceptable quality and that are recommended for use include those by Lake Shore Industries, Peachtree Doors, Pease or Stanley Company.

9.17.3 COMBINATION STORM DOORS

Aluminum Storm Doors shall be the self-storing, screen/storm "combination" type, with baked enamel factory prefinished color to match the color scheme of the housing unit. Aluminum Storm Doors shall be provided for all housing unit exterior hinged doors. This shall include secondary entrance doors and the interior man doors in the garage that provide access into the unit, but not the exterior man doors that provide access into the garage. The only exception to this is the patio doors, which shall be provided with sliding screen doors. Door shall have treated moisture resistant solid wood cores, encased in s seamless aluminum laminated finish on both sides. Door bottom shall have 2-inch bottom expander with vinyl sweep. Doors shall be complete with 1/8-inch tempered glass with wrap around marine glazing, screen sections, and weather-stripped Z-bar frames. Frames shall be a minimum of 1-inch thick and 5-inches wide aluminum clad with heavy-duty extruded aluminum. Screening materials shall be charcoal color vinyl coated 18/16 mesh fiberglass screen cloth. Products which define a level of acceptable quality and that are recommended for use include those manufactured by Emco, Larson Manufacturing Company or Windo-Therm.

9.18 INTERIOR DOORS

Interior swing and bi-fold doors shall be 6-foot 8-inches in height by 1-3/8-inch thick, hollow core construction with a hardwood face in a coordinated panel type "stile and rail" design. Frames shall be a minimum of Custom Grade conforming to AWI Section 900, of hardwood material suitable for painting. Frame joints shall be dadoed or routed and shall have joints glued and pinned.. Fixed stops shall be routed into frame and glued. Casings shall be provided with the door package. Wood doors and trim shall be provided with a painted finish. Products which define a level of acceptable quality and that are recommended for use include the "Legacy" series manufactured by Premdor.

9.18.1 BEDROOM DOORS

To the maximum extent possible, door jambs shall be located to permit placement of furniture in the corners of the rooms by providing at least 18-inches return adjacent to a furnishable wall.

9.18.2 BATHROOM DOORS

Minimum door widths for bathrooms shall be 2-feet 6-inches, except that door widths for units designated for potential use by persons with disabilities, shall conform to accessibility standards.

9.18.3 CLOSET DOORS

Bedroom closets 6-ft or more in width shall have sliding doors, maximum 6-feet 8-inches in height. Closets less than 6-feet in width shall have bi-fold doors, 6-feet 8-inches high. Wall closet width shall not extend beyond either door jamb more than 20-inches. Other closet doors may use standard swinging type doors 6-feet 8-inches in height. Closet doors that are bi-folding shall have 3-inch long brass finished wire pulls.To the maximum extent possible, closet door jambs shall be located to permit placement of furniture in the corners of the rooms by providing at least 18-inches return adjacent to a furnishable wall.

9.18.4 OTHER DOORS

In locations where a door separates inhabited spaces from equipment spaces, interior doors shall also provide Life Safety protection and meet code requirements appropriate to the hazards represented.

9.18.5 PATIO DOOR

Door to patio shall be in-swing hinged double sash (both operable), with sliding screen doors. Each leaf shall be 32-inches wide, with windows and muntins (atrium type). Patio Doors shall be Grade 60 with a DP40 as per the requirements NWWDA I.S. 8. Patio Door and I.S. 2. Wood molding shall be provided around the interior frame of the door and shall have a painted finish to match other wood trim in the unit. In addition to the latchset, the patio door shall be provided with a deadbolt. In units designed to be handicapped accessible patio door threshold shall meet the requirements of FED-STD-795.

a) Door shall be wood clad with rigid vinyl (PVC).

- Rigid vinyl shall have water-repellent preservative-treated wood frame and panel members with rigid vinyl (PVC) cladding of minimum polyester urethane finish film of 2.6 mil dry thickness over all exterior exposed surfaces. Exterior finish shall be electrostatically factory applied Flexacron or equal; interior unfinished clear pine for painted finish. Sill shall be anodized aluminum 0.062-inch thick attached to a solid wood frame.

- Products that define a minimum level of acceptable quality for the Patio Doors and that are preferred by Ellsworth AFB for use on this project for the non-handicapped accessible units include the Frenchwood Hinged, Double Pane Insulated, High Performance, Patio Doors, Model

FWH6068PALR (right hand swing) and Model FWH6068PARL (left hand swing) as manufactured by Anderson. For the handicapped accessible units the Premium Steel Patio Doors, Model 118LE as manufactured by Therma-Tru Corporation is preferred by Ellsworth AFB. On handicapped accessible units the Patio Door in addition to meeting the threshold requirements shall also provide a minimum 32-inch clear opening.

9.19 BUILDERS HARDWARE

Hinges, locks, and latches will comply with the specifications indicated in Table 9-12, and the following subparagraphs:

TABLE 9-12 – HARDWARE SPECIFICATIONS

Hardware Type/ Specification	Specific Requirements
Hinges BHMA 101	Hinges shall be 4-inches x 4-inches at exterior doors, and 3-1/2-inches x 3-1/2-inches at interior doors.
Locks & Latches BHMA 601	Series 4000, Grade 1, at exterior doors. Grade 2 at interior doors.
Auxiliary Locks BHMA 501	Series 4000, Grade 2.
Interconnected Lock & Latches BHMA 611	Grade 2.
Closers BHMA 301	Series CO2000, Grade 2.

9.19.1 LOCKS AND KEYING

Lock cylinders shall have six pin tumblers with an "H" key way and interchangeable cores, which are removable by a control key. The entire project shall be "master keyed" with keying instructions furnished to the Contractor by the Contracting Officer. Locks for entrance doors to individual family units, including garage door(s), (including locks on doors from garage to interior of housing unit and all exterior bulk storage areas) shall be keyed differently from any other housing unit. All exterior locks on each housing unit, shall be keyed alike. Locks for each housing unit shall be keyed alike. The Contractor shall provide one extra set of cores for each housing unit and furnish six keys for each key change and for master key system and control key. Locks and keys shall conform to the standards and requirements of the Builders Hardware Manufacturers Association (BHMA) listed above and shall be , "Schlage" or equal. Master keying must be an extension of the existing "Falcon" system. Contracting Officer shall provide master key codes to hardware manufacturer. All hardware shall be bright brass finish.

9.19.2 WEATHER-STRIPPING

Provide vinyl weather-stripping, sweep strip and exterior thresholds for all exterior housing unit, patio, exterior garage and garage to housing unit doors. Vinyl magnetic weather-stripping is acceptable for metal doors. Exterior thresholds shall be nonferrous metal. Threshold for handicapped units shall meet the requirements of FED-STD-795.

9.19.3 HARDWARE APPLICATIONS

Door hardware including locks and hinges shall be applied as follows:

a) Each swinging door shall have a solid leg (not spiral wire type) door stop mounted to the wood floor base. Hinge pin type door stops are not acceptable. Front & rear entrances of each unit shall be provided with a mechanical door chime with different sound for easy door recognition. Provide illuminated push button mounted on exterior wall near latch side of entrance door. Locked storm door shall not block access to door bell button.

b) Exterior Main Entrance Doors shall be provided with either a lockset and an auxiliary dead bolt lock or an interconnected dead bolt lock and latch that comply with Federal specification, ANSI/BHMA Standard A156.2, Series 4000, Grade 1, Function F81. Entrance locks shall match model "A52PD" as manufactured by Schlage with a lever handle. Contractor shall furnish all exterior locks with removable cores. Trim for locksets shall be wrought construction. Deadbolt locksets on each unit shall be keyed alike. Each door shall have 1-1/2 pair of hinges and a door stop. Door shall include a wide-angle viewer through door at eye level (5-feet 5-inches). Products which define a level of acceptable quality and that are recommended for use include those manufactured by Falcon, Schlage and Westlock.

c) Exterior Secondary Entrance Doors shall be provided with either a lockset and an auxiliary dead bolt lock or an interconnected dead bolt lock and latch that comply with ANSI/BHMA Standard A156.2, Series 4000, Grade 1, Function F81. Entrance locks shall match model "A52PD" as manufactured by Schlage with a lever handle. Contractor shall furnish all exterior locks with removable cores. Trim for locksets shall be wrought construction. Deadbolt locksets on each unit shall be keyed alike. Each door shall have 1-1/2 pair of hinges and a doorstop. Products which define a level of acceptable quality and that are recommended for use include those manufactured by Falcon, Schlage and Westlock.

d) Exterior patio doors shall have either a latchset and an auxiliary lock or an interconnected lock and latch that comply with Federal specification, ANSI/BHMA Standard A156.2, Series 4000, Grade 1. Each door unit shall have 3 pair of hinges and a pair of lever extension flush bolts top and bottom of inactive leaf, with bottom bolt into dust proof strike at threshold.

e) Exterior Combination Storm Doors shall be provided with hinges of the heavy duty self lubricating double leaf type. Operating hardware shall be complete with inside thumb lock and closers. Latches shall be placed so as not to interfere with other exterior door hardware.

f) Each windowless exterior entrance door will have a viewer mounted at eye level.

g) Doors in fire-rated walls and in fire rated walls from the housing unit to garage are required to be self-closing. Door closers in one hour rated walls shall comply with ANSI/BHMA Standard A156.4. Hardware for fire rated doors shall have 1-1/2 pair of ball-bearing hinges, lockset, auxiliary lock or interconnected lock and latch, closer, weather-stripping and threshold. Doors and hardware at these locations shall meet the requirements of NFPA101.

h) Interior privacy latchsets shall comply with ANSI/BHMA Standard A156.2, Series 4000, Grade 2, function F76 and shall match Schlage model A40S. Interior passage shall comply with Series 4000, Grade 2, Function F75 and shall match Schlage model A10S. Trim for latchsets shall be wrought construction. All interior doors shall have 1-1/2 pair of hinges and a doorstop. Only bathrooms and bedrooms shall have privacy latchsets. Latchsets shall have a lever type handle. Bi-fold style doors shall have appropriate hardware with reinforcing as necessary.

i) Wardrobe bi-fold closet doors shall be provided with top door track only.

9.20 BUILDING SIGNAGE AND MAILBOXES

Each housing unit with exterior entrance will have a number visible from the vehicular circulation. Mailboxes for the units will be gang type.

9.20.1 HOUSE ADDRESS SIGNAGE

Provide a photocell controlled and lighted house address number sign for each unit, which is located in such a position as to be easily seen from the street.. The Contractor is responsible for obtaining the house numbering system from the CO's representative. The house address signage unit shall be an energy efficient lighting fixture which meets the following specifications: (a) Housing lens or diffuser - Thermoplastic, recognized component polycarbonates. (b) Frame sleeves - Thermoplastic recognized component ABS resin, U.V. stabilized. (c) Number plate - Translucent white thermoplastic recognized component polycarbonate U.V. stabilized. House numbers shall be 4-inch/brass (4 digits plus letter required) Typeface shall be Clarendon medium. (d) Back plate - Prepainted white steel A/S/1010/Thickness 0.0315. (e) Photocell - U-shaped mounting bracket that secures to back plate by a snap fit. (f) Socket assembly must be U.L. listed. Products that define a minimum level of acceptable quality for the lighted house address signage fixture and that are recommended for use include the Ambiance Type N Model 9600-12 as manufactured by Sea Gull Lighting Products Inc.

A nameplate holder approximately 3-inches X 18-inches of extruded metal (finish to match the house numbers) shall be mounted below each lighted house address number. Nameplates shall be mounted with a minimum of two fasteners. Furnish samples of House Numbers, Name Plate Holder and proposed mounting locations to the Contracting Officer for approval.

9.20.2 MAILBOXES

Per Postal Regulations, the contractor shall install one Neighborhood Delivery and Collection Box Unit (NDCBU) (ganged mailboxes), which shall be installed on post supports constructed in accordance with the bases Community Plan details. The unit shall contain 75 individual lockable mailboxes. The location of the NDCBU shall be as indicated on the site plans and as coordinated with the contracting officer. US Postal Service approved NDCBU shall be submitted to the Contracting Officer by the Contractor for approval in accordance with Section 01332, SUBMITTALS DURING DESIGN.

9.21 KITCHEN/BATH CABINETS

Cabinets shall be constructed per AWI standards. Wall and base cabinets shall be essentially of the same construction and appearance. Cabinets shall be factory manufactured of Custom grade, oak, plain sliced transparent finished for all exposed parts. All interior surfaces shall be natural finish to match the exterior, or matching melamine plastic finish. Wall and base cabinets, except as noted otherwise, shall have adjustable shelves. Cabinets shall have spring-loaded self-closing, Invisible mounting, European style hinges, and 110-degree minimum opening. Pulls shall be as specified herein. All kitchen base cabinets shall have two full depth heavy duty pull out shelves; one shelf shall be located at the bottom and one approximately half way between the bottom and the drawer unit. The heavy-duty pull out shelves shall have lipped edges front and back; the two sides shall be sized to accommodate the drawer. Hinges shall have zero protrusion at locations with pull out shelves. Upper and lower cabinets in kitchen corners shall have "Lazy Suzan" type cabinets to allow maximum use of cabinet space and provide accessibility in the corner cabinet areas. Cabinets and countertops shall have a flame-spread rating that does not exceed 200 when tested in accordance with ASTM E84 and ASTM E162, Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source. Refer to Table 9-5 for minimum kitchen cabinet area requirements.

In units designated to be handicapped accessible, kitchen cabinets shall be provided in accordance with FED-STD-795 and shall be provide as being adaptable in accordance with Section 4.34.3. As per FED-STD-795, at least one 30-inch section of the work surface of the counter shall be provided to meet the accessibility requirements. As adaptable, counters the 30-inch section shall be adjustable as a unit to provide alternative heights of 28-inches, 32-

inches, and 36-inches, measured from the floor to the top of the counter surface. All counter and back splash joints between adjustable and fixed cabinet sections shall be caulked flush to prevent the penetration of fluids and debris between the cabinet sections. Ensure that when the counter is lowered, the exposed sides and back of the adjacent cabinets are constructed of a durable, non-absorbent material finish similar to that of the counters. Base cabinets, if provided, shall be removable under the full 30-inch minimum frontage section of the counter. The finished floor and base shall extend under the counter to the wall.

In units designated to be handicapped accessible, an adaptable sink and surrounding counter section shall also be provided in accordance with FED-STD-795 as being adaptable in accordance with Section 4.34.3. As per FED-STD-795 this section shall at minimum of 30-inches in width, which includes the sink and counter. As an adaptable sink and counter the 30-inch section shall be adjustable as a unit to provide alternative heights of 28-inches, 32-inches, and 36-inches, measured from the floor to the top of the counter surface. Rough-in plumbing and electrical shall be located to accept connections of supply, drain pipes and garbage disposals for sinks mounted at the height of 28-inches. Faucets for sinks in adaptable units shall meet the requirements of FED-STD-795. All counter and back splash joints between adjustable and fixed cabinet sections shall be caulked flush to prevent the penetration of fluids and debris between the cabinet sections. Ensure that when the counter is lowered, the exposed sides and back of the adjacent cabinets are constructed of a durable, non-absorbent material finish. Base cabinets, if provided, shall be removable under the full 30-inch minimum frontage section of the counter. The finished floor and base shall extend under the counter to the wall.

In units designated to be handicapped accessible if accessible or adaptable bathrooms are provided with cabinets under the lavatory, then they shall be removable to provide the clearances specified in FED-STD-795, Section 4.22.6.

As a betterment, Double lavatories shall be provided in Master Bathrooms.

9.21.1 CABINET CONSTRUCTION

Wall and base cabinets shall be of essentially the same construction and appearance. Door design shall be constructed with solid flush face or framed inset hardwood panels. Base and wall cabinets shall be constructed with frame fronts and solid ends, or frame construction throughout. Cabinets shall be constructed per AWI Standards for custom grade joinery utilizing European assembly screws, dowels or stop dados, which are glued together. Brace the top and bottom corners with hardwood blocks that are glued with water-resistant glue and nailed in place. Wood cabinet materials and dimensions - Materials and minimum dimensions and thickness for cabinet construction materials shall comply with Table 9-13 and requirements below.

9.21.1.1 Lumber Products

a) Softwood lumber: PS 20 custom grade, moisture content 6%.

b) Hardwood lumber: PS 58, custom grade.

9.21.1.2 Sheet Materials

a) Hardwood plywood: PS-51 custom grade; core material of particleboard, Red Oak plain slice, grade "A" finished side and grade "3" for back ply material.

b) Wood particleboard: Custom grade, composed of wood chips made with waterproof resin binders of 45-pound density sanded faces.

c) Softwood plywood: PS 1, custom grade, core material of particleboard; species of Douglas Fir.

TABLE 9-13 - KITCHEN/BATH CABINET SPECIFICATIONS

Element Description	Specific Requirements
Frame Members	Per AWI and a minimum 3/4-inch thick by 1-1/2-inch wide kiln-dried solid hardwood.
Base Cabinet Toe Space	2-1/2-inches deep x 4-inches high with 3/4-inch hardwood.
Cabinet Bottoms, Backs Ends, & Tops	Cabinet ends shall be 5/8-inch medium density overlaid plywood with hardwood veneer where exposed. Backs of wall cabinets shall be 1/4-inch plywood. Backs of base cabinets shall be 3/8-inch minimum plywood. Provide 3/8-inch thick plywood bottoms in kitchen/bath sink cabinets. Brace bottoms with wood members glued in place.
Doors	Door design shall be 3/8-inch minimum hardwood panels inset into 3/4-inch thick hardwood stiles and rail frames or 3/4-inch minimum solid hardwood flush face. Door pulls shall be “lipped”, routed into bottom edges.
Drawer Slides/Guides	Drawer slides/guides shall be solid stud acetyl roller, captive in one channel member, 100-pound/pair load capacity, side and bottom mounting, white color epoxy-coated cold rolled steel with positive stop. Lift-out disconnect "stay closed design". Top mounted center drawer guides will not be acceptable.
Drawers	Drawer face design shall be 7/16-inch minimum hardwood panels inset into 3/4-inch thick hardwood stiles and rail frames or 3/4-inch minimum solid hardwood flush face. Using dowel or French dovetail joints to fasten side to back and front. All joints glued. All drawers and pull out shelves shall be mounted with side and bottom mounted slides. Drawer pulls shall be “lipped”, routed into bottom edges.
Drawer Sides and Bottoms	Drawer sides shall be 1/2-inch minimum solid hardwood. Bottoms to be 1/2-inch minimum solid hardwood or plywood attached to the bottom of sides, fronts and backs using glue and mechanical fasteners.
Screws	Per AWI custom techniques.
Bumper Pads	Rubber.
Shelves	All shelves shall be fully adjustable, 3/4-inch minimum thick medium density custom grade particle board or custom grade plywood coated with 3-mil industrial paper with double smoothing melamine topcoat on both sides. Which shall be supported on steel support flush mounted angles with ¼-inch diameter by 3/8-inch long dowel pins, adjustable at 1¼-inches on center. Shelf edges exposed to view shall be hardwood, rounded, filled, sanded, and finished.

9.21.2 COUNTERTOPS

Countertops finish, except as otherwise noted for bathroom countertops, shall be high pressure laminated plastic 0.048-inch thick with integral backsplash, and shall be applied with heat-resistive adhesive. Minimum backsplash height is 4-inches. Backsplashes shall be provided at both back of counters and at side of counters where abutting a wall. The substrate for countertops shall be ¾-inch thick particleboard.

As a betterment to high pressure laminated plastic, solid surface countertops with backsplashes that are scribed to fit with joints glued and sealed shall be provided in Kitchen and Bathrooms. Solid surface material as manufactured by Corian is preferred by Ellsworth AFB.

9.22 PASSIVE SOLAR APPLICATIONS

Passive solar architectural applications shall routinely be considered as a part of all project designs. Unique applications such as attached sun spaces, earth sheltering, mass trombe walls, solar chimneys, and other innovations may be considered. Operational controls, such as shading and venting mechanisms, to control the amount of heat admitted into the housing unit during the day, reduce the amount of heat escaping from the housing unit at night, and provide for thermal comfort of the occupants, are parts of this system.

9.22.1 ADDITIONAL SOUTH GLAZING

If used as part of the solar energy system, glazing shall be of the commercially available off-the-shelf type. The glazing shall be architecturally compatible with the housing unit and the environment, and shall have a whole-window U-Value less than 0.28 ft^2-degrees F/BTUH.

9.22.2 SHADING

Cooling season shading of glazed surfaces on the west and south elevations shall be considered.

9.23 ADDITIONAL ARCHITECTURAL BETTERMENTS

As a betterment to the basic design, elements that add to the functionality and aesthetics of the living units are preferred by Ellsworth AFB. This includes features such as, Decorative Moldings, Vaulted Ceilings, Built-in Desks, Window Seats, Extra Shelving, Covered Porches, etc.

PART 10 - HOUSING UNIT STRUCTURAL DESIGN

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10 HOUSING UNIT STRUCTURAL DESIGN

10.1 GENERAL

Structural design and construction shall be in accordance with the requirements stated herein. A registered structural engineer shall design structural elements not covered prescriptively by the indicated references. The overall structural system shall be selected based on durability, maintainability, and cost-effectiveness.

10.2 REFERENCES

10.2.1 INTERNATIONAL CODE COUNCIL PUBLICATIONS (ICC)

IBC International Building Code (2000)

IRC International Residential Code for One- and Two- Family Dwellings (2000)

10.2.2 AMERICAN FOREST AND PAPER ASSOCIATION

Details for Conventional Wood Frame Construction (2001)

10.3 DESIGN LOADS

10.3.1 DEAD LOADS

The structural system shall be designed and constructed to safely support all dead loads, permanent or temporary, including self weight, partitions, insulation, ceiling, floor covering, and all equipment that is fixed in position.

10.3.2 ROOF LIVE LOADS

Roofs shall be designed to support live loads, including snow, snow drifting and unbalanced snow loads, in accordance with applicable sections of IRC using the following criteria:

Minimum Roof Live Load	30 PSF
Roof Snow Load	30 PSF

10.3.3 FLOOR LIVE LOADS

Floors shall be designed to support live loads as specified below. Loads shall be applied in accordance with IRC.

Living Space	40 PSF
Stairs (Concentrated Load)	300 LBS
Uninhabitable Attics without storage	10 PSF

10.3.4 WIND LOADS

The structural framing and anchorages for exterior cladding and windows shall be designed to resist wind loads calculated and applied in accordance with IRC. Wind loads shall be calculated using the following wind speed parameters:

Basic Wind Speed	90 MPH
Exposure	C

10.4 MATERIALS

10.4.1 REINFORCED CONCRETE

Reinforced concrete shall conform to the requirements of IBC and the following:

a) The minimum 28-day compressive strength of the concrete shall be 4000 psi. Type II cement shall be used in the production of concrete. For concrete with an exterior exposure, air-entrainment, producing a total air content in the concrete between 4 and 7 percent by volume, shall be required.

b) Minimum reinforcement in concrete walls, footings and members shall be as required for temperature and shrinkage. Minimum bar size shall be #4 deformed bars.

c) Minimum reinforcement for concrete slabs-on-grade in garage areas shall be #4 deformed bars spaced at 18 inches on center in each direction

10.4.2 STEEL

a) Structural steel shall conform to the requirements of IBC.

b) Cold-formed steel members shall conform to the requirements of IRC.

10.4.3 WOOD

Wood shall conform to the requirements of IRC and the following:

a) Exposed exterior wood such as columns, beams, stair stringers, and railings shall be of lumber that is decay resistant or pressure treated for decay resistance. In addition, all wood in contact with concrete shall be pressure treated for decay resistance. Wood that can come in physical contact with people such as decking and railing shall not contain arsenic based preservatives.

b) Wood structural panels as defined by IRC shall be used in structural applications including roof, floor, and wall sheathing. Examples of wood structural panels are plywood and oriented strand board (OSB). Particleboard and fiberboard shall not be used in structural applications.

10.4.4 MASONRY

Design of masonry work shall be in accordance with IRC and the following:

a) Reinforcement shall be sufficient to satisfy the calculated requirements for strength, shrinkage crack control, and seismic design. Brick and concrete masonry units shall conform to the material specifications of IRC.

b) Compressive strength of masonry shall be f'm = 1350 psi. All mortar for masonry work shall be Type S.

c) Compressive strength of grout, where required, shall be 2000 psi minimum.

d) 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. Control joints shall not be placed closer than 2'-0" to openings.

10.5 CONSTRUCTION

10.5.1 FOUNDATION DRAINS

Foundation drains shall be provided for all foundations. Drains shall be installed in accordance with IBC, PART 6 – GRADING, DRAINAGE, AND ERROSION CONTROL, and the attached Geotechnical Report.

10.5.2 FOUNDATION DAMPPROOFING

Foundation walls retaining earth and enclosing interior spaces shall be dampproofed in accordance with IBC. See PART 9 – HOUSING UNIT DESIGN/CONSTRUCTION, paragraph BITUMINOUS DAMPPROOFING MEMBRANE SYSTEM.

10.5.3 FOOTINGS

a) Footings shall be constructed of reinforced concrete.

b) Bottom of footings shall be placed not less than 4 feet below finish grade for frost protection.

10.5.4 FOUNDATION AND CRAWLSPACE WALLS

a) Walls shall be constructed of reinforced concrete or reinforced concrete masonry. Surface treatment of foundation walls shall be as specified in PART 9 – HOUSING UNIT DESIGN/CONSTRUCTION.

b) Walls for garages shall be not less than 6 inches thick. All other walls shall be not less than 8 inches thick.

c) Walls shall extend at least 8 inches above finish grade.

10.5.5 STOOPS

Stoops shall be designed to resist frost heave. This is critical at handicap entrances where top of stoop is level with door threshold.

10.5.6 SLABS-ON-GRADE

a) Concrete slabs-on-grade shall be not be less than 4 inches thick and designed as "floating slabs" without rigid edge support. Bond breaker, such as building felt, shall be used between slab edges and abutting vertical surfaces.

b) A capillary water barrier and vapor barrier are required for all interior slabs on grade, including garages, and crawl spaces. As a minimum, the vapor barrier shall be a polyethylene sheet not less than 10 mils thick. Provide a 6-inch crushed rock capillary water barrier below the vapor barrier. Capillary water barrier shall contain not more than 10 percent material that passes a No. 4 sieve barrier with all material shall passing a 2-inch sieve.

c) Interior slabs shall have an active system for radon mitigation placed beneath the slabs. See PART 11 - UNIT DESIGN- PLUMBING, paragraph RADON PREVENTION AND TESTING.

d) Crack control measures shall be incorporated into all slab-on-grade construction. Areas bounded by crack control joints shall be approximately square with sides not exceeding 12 feet in length. Reinforcement in garage and crawl space slabs shall have alternating bars terminated at joints, such that only one-half of the total reinforcement extends through the joint, forming a weakened plane. Reinforcement terminated at joints shall be stopped 2 inches back from the joint on each side of the joint.

e) All interior slab crack control joints, and joints between edges of interior slabs and vertical surfaces, and any mechanical, plumbing or electrical penetrations through interior floor slabs shall be sealed with a flowable polyurethane caulk for radon mitigation.

f) Garage slabs shall be given a steel troweled finish. Crawlspace slabs shall be given a wood float finish. All exterior slabs shall be given a light broom finish.

10.5.7 FRAMING

Framing shall be done with wood, structural steel, cold-formed steel members, or combinations thereof. Panelized or modular systems constructed offsite shall be allowed. Structural floor members shall be designed such that live load deflections do not exceed 1/480 times the span length of the member. Non-floor members supporting gypsum board shall be designed such that live load deflections do not exceed 1/360 times the span length of the member. Live load deflections of other members shall not exceed 1/240 times the member span length.

10.5.7.1 Wood

a) Wood shall be erected and fastened in accordance with IRC and the Details for Conventional Wood Frame Construction.

b) Engineered wood joists or trusses shall be used for wood structural members supporting floors. No dimensional lumber shall be used for floor framing members.

c) All roof sheathing laid shall be covered with felt by the end of each day or when a storm is approaching. Roof sheathing damaged due to moisture shall be replaced.

d) Floor sheathing shall be glued and screwed to supporting members.

e) Sub-floors shall be protected from the elements of weather at all times during construction. Any panels damaged from water or other means shall be replaced.

10.5.7.2 Structural Steel

Structural steel shall be erected and fastened in accordance with IBC.

10.5.7.3 Cold-Formed Steel Structural Members

Cold-formed steel structural members shall be erected and fastened in accordance with IRC.

PART 11 - UNIT DESIGN – PLUMBING

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11 UNIT DESIGN - PLUMBING

11.1 GENERAL

Plumbing system(s) shall be designed and installed in accordance with International Plumbing Code (IPC). Inspection and testing of the plumbing system(s) shall be performed as prescribed in the IPC. Endpoint devices (e.g. lavatory faucets, kitchen faucets, and drinking fountains) shall be in accordance with ANSI/NSF 61-1998 Part 9, "Drinking Water System Components – Health Effects." See PART 8 - SITE UTILITIES for additional exterior mechanical requirements.

11.2 WATER PIPING

Under slab supply piping shall be limited to housing unit's service entrance only. Service lines to each duplex housing unit shall be no less than 1 1/4 inch (in.) diameter (existing service lines are x inch diameter and shall be replaced). Where duplex units are provided this may split into two 1-inch service lines minimum serving each dwelling unit. New lines shall be installed a minimum of **6** feet of cover over the top of the pipe. New curb stops are required. Service entrance shall be provided with main isolation valve, double-check backflow preventor with isolation valves**,** and main drain valve. Service line piping shall be configured to allow installation of a compression tank, a future water meter and connection to a future water softener system. All water piping shall be sized in accordance with methods outlined in the IPC, and to limit water velocity in the pipe to 8 feet per second unless a lower velocity is recommended by the plumbing fixture manufacturer. Cross connections between water supply piping and waste, drain, vent, or sewer piping is prohibited.

a. An isometric diagram(s) of the water system(s) shall be included in the 100% design submittal after contract award. See Section 01332 SUBMITTALS FOR DESIGN. Allowable pipe materials are listed below.

11.2.1 COPPER TUBING

Water piping under concrete slabs shall be copper tubing, type K, annealed. Joints under the slabs are prohibited. Interior water piping shall be type K hard-drawn copper. Fittings for soft copper tubing shall conform to ANSI B16.26, "Cast Copper Alloy Fittings for Flared Copper Tubes," and for hard-drawn to ANSI B16.22, "Wrought Copper and Copper alloy Solder Joint Pressure Fittings." Underslab supply piping shall be limited to housing unit's service entrance only. Lateral water lines into the occupant's or family housing units shall be copper as specified. Upon completion of rough-in operation and prior to concealing in the structure and the setting of plumbing fixtures, the housing unit's entire hot and cold water piping systems shall be tested at a hydrostatic pressure of not less than 100 pounds per square inch gage (psig), and proved tight at this pressure for 2 hours. Where a portion of the water piping system(s) is to be concealed before completion, such portion shall be tested separately in the same manner as specified for the entire system.

11.3 SOIL, WASTE, VENT, AND DRAIN PIPING

Where duplex units are provided one 4-inch service lines minimum shall serve each dwelling unit. Except as noted below; soil, waste, vent, and drain piping shall be polyvinyl chloride (PVC), or plastic suitable for installation in a residential waste, soil, vent, and drain system(s). Each fixture and piece of equipment, except water closets, requiring connection to the drainage system(s), shall be provided with a trap. Provide deep seal trapped drain with airgap for furnace cooling coil condensate drains. Condensate drains shall be PVC pipes, copper & flexible rubber tubing is not allowed. Soil, waste, and drain piping installed below floor slabs shall be service weight hub and spigot cast iron, plastic pipe suitable for installation in a residential waste, soil, vent, and drain system(s), or Acrylonitrile-Butadiene-Styrene (ABS). Building

waste main lines shall be 4-inch diameter. All soil, waste, and drain piping shall be sized in accordance with the methods outlined in the IPC. Provide an approved double wye cleanout immediately outside of the occupant or family building's main waste line. Plumbing vents shall not vent into attics but, penetrate roofs with a weather cap and extend above the roof per code. Locate vents on the backside slope of the roof so as not to be visible from the front of the housing units. All unfinished plumbing work, such as cleanouts, fittings, etc, exposed to finished rooms or spaces shall be concealed by an escutcheon plate or similar finished devices. Soil, waste, and drain piping shall be tested with water or air before fixtures are installed. After the plumbing fixtures have been set and the traps filled with water, the drain and waste lines shall be submitted to a visual test for leakage. Condensate lines shall be one size larger than the drain pans connection, be properly trapped, and not directly connected to a sanitary sewer system (an air gap fitting is required).

a. An isometric diagram(s) of the sanitary sewer system(s) shall be included in the 100% design submittal after contract award. See Section 01332 SUBMITTALS FOR DESIGN.

11.3.1 WATER TEST

Water test shall be applied to the soil, waste, and drain system(s) either in the entire system(s) or in sections. If the test is applied to the entire system(s), all openings in the piping shall be tightly closed except the highest opening, and the system(s) shall be filled with water to the point of overflow. If the systems are tested in sections, each opening except the highest opening of the section under test shall be tightly plugged, and each section shall be filled with water and tested with at least a 10-feet head of water. In testing successive sections, at least the upper 10 feet of the next section shall be tested, so that each joint or pipe in the building, except the uppermost 10 feet of the system(s), has been submitted to a test of at least 10 feet of head of water. Water shall be kept in the system(s) or portion under test, for at least 15 minutes before inspection starts. If no leakage is discovered the system(s) shall then be tight at all joints.

11.4 GAS CONNECTIONS

Piping connections to all gas burning equipment shall be made with rigid pipe and fittings. The use of semirigid tubing and flexible connectors to connect gas equipment and appliances is prohibited. Except that the final connections to the kitchen range/oven shall be made using flexible connectors conforming to ANZI Z21.45; "Flexible Connectors of Other Than Metal construction for Gas Appliances," and shall be not less than 40 inches long. Interior pipe shall be steel Schedule 40 black, as specified in ASME B31.8; "Gas Transmission and Distribution Piping Systems." Fitting shall be malleable iron conforming to ANSI B16.3 "Malleable Iron Threaded Fittings." Provide accessible gas shutoff valve and couplings for each gas range/oven, water heater and furnace. Exposed horizontal piping shall not be installed farther than 6 inches from the nearest parallel wall in laundry areas or areas where clothes hanging could be attempted. Provide a ½-inch gas line connection directly off the main for the potential gas clothes dryers, with a ball valve & cap. The Base will run any future flex gas lines for the occupants. The calorific value of the natural gas to be used in calculations for sizing equipment and piping shall be 1000 Btu per cubic foot.

11.4.1 GAS PIPING

The interior gas piping, from the low-pressure regulators to the equipment, shall be wrought iron or steel, and the fittings, shall be malleable iron conforming to ANSI B36.10; "Welded and Seamless Wrought Steel Pipe." The complete piping installation shall conform to all aspects of NFPA 54; "National Fuel Gas Code," except as stated in paragraph "Gas Connections."

11.4.2 GAS TESTING

Prior to testing, the system shall be blowout, cleaned and cleared of all foreign material. The Contractor shall set up in an accessible position, where directed, a test pump and a mercury gauge connected to the permanent gas piping. Pump and gauge shall be properly protected and kept in working order until after

final inspection. All gas piping shall be subjected to an air test of 15-inch mercury column pressure without drop for 15 minutes (min.). Gas piping shall be tested with air only. Tests shall be made by and at the expense of the Contractor and at such time as directed, and in the presence of the authorized Government representative. If there is any reduction in pressure during test period, tests isolated sections and joints with soapsuds and replace leaking joints and reapply test.

11.4.3 GAS PURGING

After testing is completed, and before connecting any appliances, all gas piping shall be fully purged. Piping shall not be purged into the combustion chamber of an appliance. The open end of piping systems being purged shall not discharge into confined spaces or areas where there are ignition sources unless the safety precautions recommended in NFPA 54; "National Fuel Gas Code" are followed.

11.5 PLUMBING FIXTURES

Residential type fixtures and trim shall be provided and shall comply with ANSI Standards. Faucets shall be in accordance with ANSI/NSF 61-1998, Part 9; "Drinking Water System Components – Health Effects" and be provided with ceramic disk valves. Fixtures shall be provided complete with fittings, and chromium-plated or nickel-plated brass (polished bright or satin surface) trim. All fixtures, fittings, and trim in each project shall be from the same manufacturer and shall have the same finish. Faucets may be from a different manufacturer as the fixtures, fittings, and trim; however, all faucets shall be from the same manufacturer. Metal escutcheons plates shall be installed at all water supply and drainpipe connections through walls or cabinets.

a. Accessible unit fixtures except kitchen sinks shall be in accordance with the following: ANSI A117.1 - 2003; "Accessible and Usable Buildings and Facilities." the Americans with Disabilities Act of 1992 (ADA) with amendments through January 1998, Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) and Americans with Disabilities Act (ADA) Building Elements Designed for Children's Use" (if directed) unless otherwise indicated. Adult reach ranges is 48 inch high to a low of 15 inches.

b. Plumbing shall meet the following criteria:

1) Exposed traps, including those located within cabinets, shall be chromium-plated, adjustable-bent tube, 18-gauge brass. Concealed traps may be plastic (ABS).

2) Faucets shall be lead-free construction, centerset, single-control type, with seals and seats combined in one replaceable cartridge designed to be interchangeable among lavatories with aerators, bathtubs and kitchen sinks. Water flow shall be no more than 2.5 gpm from any faucet.

3) A diverter valve shall control shower and bath combinations. Baths and bath/shower combinations shall be provided with waste fitting pop-up, concealed with all parts removable and renewable through the overflow and outlet openings in the tub with access panels. Showers shall be provided with a grid strainer. Showers and bath/shower combinations shall be equipped with a combination valve and pressure-balanced flow control device to limit the flow to 2.5 gallon per minute (gpm) at pressure between 20 to 60 pounds per square inch (psi). Showers and bath/shower combination fixtures shall be ADAAG handicapped accessible when installed in handicapped accessible housing units.

4) Piping shall be concealed. Individual water stops or shutoff valves shall be constructed of brass and have metal handles and stems; with access panels shall be provided on water supply lines to all plumbing fixtures including bathtubs and showers. Shutoff valves shall be provided for each water heater and dishwasher. In multi-story units, additional consideration shall be given in the technical evaluation to designs that provide separate shutoff valves for each floor.

5) Fixtures shall be water conservation types, as herein specified. Accessible unit's lavatories shall have centerset goosenecks with lever or push-button operated handles.

6) Vitreous china plumbing fixtures shall conform to ANSI A112.19.2M; "Vitreous China Plumbing Fixtures." Stainless steel fixtures shall be in accordance with ANSI A112.19.3M; "Stainless Steel Plumbing Fixtures (Designed for Residential Use)." Enameled cast iron plumbing fixtures shall comply with ANSI A112.19.1M; "Enameled Cast Iron Plumbing Fixtures." and enameled steel fixtures shall comply with ANSI A112.19.4M; "Porcelain Enameled Formed Steel Plumbing Fixtures."

7) Lavatories provided with counters shall be as specified in section 9.

11.6 WATER CLOSETS

Water closets shall be low profile; close-coupled tank with a round bowl with inclined tank, close-coupled siphon jet, floor outlet with wax gasket, closed-front seat and cover, and an anti-siphon float valve. Water consumption shall be no more than 1.6 gallon per complete flush cycle. Water closets shall be vitreous china and trim shall conform to ANSI A112.19.5M; "Trim for Water-Closet Bowls, Tanks, and Urinals (Dimensional Standards**)."** Internal trap size of water closets to be minimum 2 inches.

a. Water closets in accessible housing units shall have the height of the water closet between 17 to 19 inches when measured to the top of the toilet seat from the floor for an adult's use only. Minimum water closet centerline, grab bar height and dispenser height shall be in accordance with ADAAG.

11.7 LAVATORIES

Lavatories shall be rectangular counter top types, minimum 20 inches by 18 inches in size or oval minimum 19 inches by 16-inches in size. Lavatories shall be vitreous china type with front over-flow and complete with an under the counter mounting package. Lavatories provided with counters shall be as specified in section 9. Lavatories shall have pop-up drains and tailpiece.

a. Lavatories in accessible housing units shall have the height of the lavatory mounted with the rim or counter surface no higher than 34 inches above the finish floor for adults only. Minimum apron clearances, knee clearances, and toe clearances shall be in accordance with ADAAG.

b. For occupant's housing units to be adaptable to accommodate physically challenged occupant's child. Housing unit's lavatories mounting height with the rim or counter surface shall be no higher than 31 inches above the floor. Minimum apron clearances, knee clearances, and toe clearances shall be in accordance with ADAAG and ADA; "Building Elements Designed for Children's Use."

11.8 BATHTUBS/SHOWERS

Bathtubs with showers and handicapped showers shall be provided with shower doors with sliders, standalone showers shall have hinged doors**.** Faucets shall be single handle pressure balanced with integral stops and divertor and waste fitting pop-up drain.

a. Bathtub and shower shall be a combination bathtub/shower unit of one solid piece construction of fiberglass material.

b. One-piece wainscot units are required with bathtub seats and grab bars per ADAAG accessible unit requirements. Units shall be provided with shower doors and sliders. A shower spray unit with a hose at least 60 inches long that can be used both as a fixed showerhead and as a hand-held shower shall be provided in accessible bathtub/showers or stand-alone showers. Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist.

The force required to activate controls shall be no greater than 5 pounds force (lbf) for accessible showers.

11.9 KITCHEN SINKS

Kitchen sinks (shall be provided with garbage disposers) shall be Type 304 stainless steel, 20-gauge minimum, seamless drawn, and sound deadened. Sinks shall be double bowl (each a minimum of 8 inches deep), self-mounting without mounting rings, complete with cup strainer and plug. Garbage disposers shall be in accordance with UL 430; "Waste Disposers" and ASSE 1008; "Household Food Waste Disposer Units," continuous feed, and shall have a minimum motor size of 1/2 horsepower, stainless steel grinding elements, two 360-degree stainless steel swirl impellars, manual reset, and sound insulation. A plug connection is required. Strainer and plug shall be eliminated where garbage disposers are provided. Kitchen sinks faucet's flow shall be limited to 2.5 gpm complete with spray hose and crumb strainer. Accessible unit's kitchen sinks shall have center-set goosenecks with lever operated handles. Provide a cleanout and trap a minimum of 4 inches above the finished floors.

a. Kitchen sinks in accessible housing units shall have the height of the kitchen sink mounted with the rim or counter surface no higher than 34 inches above the finish floor for adults only. Minimum apron clearances, knee clearances, and toe clearances shall be in accordance with ADAAG.

11.10 WASHER CONNECTIONS

Drainage and hot and cold water supply shall be provided for clothes washers. Washer connection, complete with 2-inch drain, with mouth 3 feet above the floor, 3/4-inch hose thread supplies shall be provided in standard manufactured recessed wall boxes with single-face plates. Boxes shall be constructed of plastic, or ABS. Boxes shall be mounted a minimum of 4 feet above the finish floor. Electrical outlets for both occupant-owned washers and dryers shall also be provided but can be located separate from the washer connection box. Finish color shall be painted to match adjacent finishes. Provide 2-inch standpipe waste line for clothes washers. Provide laundry/utility sink & faucet at washer hook-up.

11.11 HOSE BIBBS

Threaded (not soldered) hose bibbs (wall hydrants) shall be provided at the front and rear of housing unit's and when possible 2 feet above the finished grade. Hose bibbs shall be 9-inch long and be anti-siphon, automatic draining type, non-freeze, frostproof, and shall be supplied with an integral backflow preventer/vacuum breaker as well as shutoff valve. Shutoff valve shall be located in an interior partition wall or chase and provided with an isolation valve with access panel.

11.12 PIPING LOCATIONS

Insulated water piping shall be installed on the warm side of building insulation in unconditioned spaces and in conditioned spaces upto and including the water heater heat trap. Piping shall be run in concealed interior walls, pipe chases, ceiling joists spaces, basement ceilings, crawl spaces, or below floors of upper stories, but not in attics or other areas subject to freezing. No water piping runs in exterior walls shall be allowed except for hose bibbs and the interior piping shall be accessible for future maintenance. Piping in basements shall be run within or through the floor joist areas to allow installation of a future ceiling at not less than not less than 8 feet. All water piping shall slope back to the service entrance for drainage. Metal protector plates shall be provided where water piping is routed through wood wall studs or ceiling plates.

11.12.1 ISOLATION VALVES

For maintenance or replacement, servicing stop isolation valves shall be installed in water connections to all installed equipment and fixtures, including wall hydrants. Stop isolation valves for piping and equipment shall be shown on the drawings.

11.13 CLEANOUTS

On straight runs of pipe, cleanouts shall be provided not more than 100 feet apart. Cleanouts shall be provided at each change of direction of pipe and shall be provided at the base of all soil, waste, and vent stacks. Accessible cleanouts shall be provided at each change in direction of sanitary sewer lines, at the intervals specified in the IPC, and at each building's service entrance. All cleanouts shall be permanently accessible. Ground cleanouts shall be located in the yard areas see paragraph 8.3.2.

11.14 WATER HEATERS

A natural gas-fired, high efficiency tank type water heater shall be provided for each dwelling unit. Water heaters for housing units shall be located in mechanical room. Water heaters shall have round; glass lined tanks, and shall be installed with an integral insulating wrap with a minimum R-value of 8.3. Access shall be provided in the wrap for service and maintenance openings. Storage water heaters that are not equipped with integral heat traps and having vertical pipe risers shall be installed with heat traps directly on both the inlet and outlet. Circulating systems need not have heat traps installed. Water heater relief drain shall be manufacturer approved, and shall be indirectly connected to the building sanitary sewer system through a floor drain. Water heaters shall be gas-fired 50 gallon (gal) with electronic pilotless ignition as shown in Table 11-1. Water heaters shall have factory-preset thermostats to limit water temperature to 120 degrees Fahrenheit (F.) maximum. Water piping connections to the heaters shall include unions and isolation valves.

TABLE 11-1 – WATER HEATER SIZING

Requirements by Fuel Type	All Units
Gas:	
Storage (gal)	50
1 hour draw (gal)	84
Recovery gallon per hour (gph)	46
Heat Recovery Efficiency	minimum 85 percent @ 90 degrees F. temperature rise

Note: Storage capacity, input, and recovery may vary with manufacturer. Any combination of the above, which produces the required hour draw and efficiency, will be acceptable. Acceptable manufacturers are "State self-cleaning Turbo Super-Saver 85+" & "Kenmore Power Miser 12."

11.14.1 GAS-FIRED WATER HEATERS

Gas fired water heaters for housing units shall be certified by American Gas Association. Working pressure shall be 150 pounds per square inch gauge (psig) with a factory test of 300 psig. Pressure/temperature relief valve, expansion tank and drain shall also be provided. Water heaters shall be direct vented. Direct-vented water heaters shall not be vented through the wall but ducted through the roofs in accordance with manufacturer's instructions. Installed in accordance with the equipment manufacturer's instructions and as specified elsewhere. Flues shall not be oversized. PVC flues when run through attics shall penetrate roofs and extend above the roof with weatherproof and concentric terminator installation per code. Flues when routed out through the roofs shall be located on the backside of the roof so as not to be

visible from the front of the housing units. Ducted combustion air shall be provided, all from outdoors in accordance with concentric terminators per Chapter 17, International Residential Code (IRC). Flues and combustion air shall be routed through the roof and located backside slope of the roof so not to be visible from the front of the house.

11.15 WATER HAMMER ARRESTERS

Commercially available water hammer arrestor units, to control water hammer, are required at housing unit's clothes washer and dishwasher supplies; supplied and installed in accordance with the manufacturer's recommendations. Air chambers are unacceptable. Access panels shall be provided**.**

11.16 REFRIGERATOR ICE MAKER

Cold water piping 1/2 -inch shall be installed behind the housing unit's refrigerator with a recessed icemaker box with nails (Oatey model 38611 or equal) and 1/4 MIP valve to allow the occupant to use a refrigerator with an icemaker. Six (6) feet of copper 1/4-inch coiled tubing shall be provided and connected to the occupant's refrigerator by the occupant.

11.17 FLOOR DRAINS

A floor drain near water heater, washer, and furnace(s) shall be provided in the mechanical room and laundry at each housing unit. The floor drain shall drain to the sanitary sewer system. In addition, a floor drain shall be provided in each laundry room. A floor drain shall also be provided in the floor of the crawl space. This drain shall be deep well and be provided with an integral backwater valve.

11.18 FLUSHING

After pressure testing and before disinfection, housing unit's potable water piping system shall be flushed with potable water to remove entrained dirt and other foreign materials. Sufficient water shall be used to produce a water velocity that is capable of entraining and removing debris in all portions of the piping system. This requires simultaneous operation of all fixtures on a common branch or main in order to produce a flushing velocity of approximately 4-fps through all portions of the piping system. Flushing shall be continued until entrained dirt and other foreign materials have been removed and until discharge water shows no discoloration. All faucets and drinking water fountains, to include any device considered as an end point device by NSF 61, section 9; "Drinking Water System Components – Health Effects," and used for drinking shall be flushed a minimum of 0.25 gallon per 24-hour period, ten times over a 14-day period. Aerators shall be removed during flushing, to prevent clogging and shall be cleaned and replaced prior to Final Inspection

11.18.1 LEAD RESIDUAL TESTING

Following the bacteriological disinfection and testing, each units plumbing system shall be flushed with a sufficient velocity of water and sufficient tests performed at each hot and cold water discharge point until no more than 15 ppb lead residuals remain in the systems. The Contractor shall adhere to NSF 61 for lead leaching. All tests and samples shall be performed in accordance with State and, if applicable Federal Regulations. Samples for testing are to be collected after a six (6) hour continuous period of no flushing, and will be considered first draw samples. Samples shall be sent to a commercial laboratory certified by the State's approving authority for examination of potable water. Once the Contractor has completed flushing and testing the systems and has determined the lead concentration to be within the limits, he shall notify the Government, and the Government then run tests to verify results. Lead residual test results shall be submitted to the Contacting Officer. The systems will not be deemed completed until satisfactory lead concentration results, less than 15 ppb, have been verified through independently sampling and testing by the Ellsworth AFB Bioenvironmental Office. All flushing and testing for lead residuals, including all costs, is the responsibility of the Contractor.

11.19 DISINFECTION

After system flushing is complete, the entire housing unit's domestic hot water and cold-water distribution shall be disinfected with chlorinating material consisting of hypochlorites or liquid chlorine. Water chlorination procedures shall be in accordance with AWWA M20; "Manual: Water Chlorination Principles and Practices." The chlorinating material shall be fed into the water piping system at a constant rate at a concentration of at least 50 parts per million (ppm). A properly adjusted hypochlorite solution injected into the main with a hypochlorinator, or liquid chlorine injected into the main through a solution-feed chlorinator and booster pump, shall be used. The chlorine residual shall be checked at intervals to ensure that the proper level is maintained. Chlorine application shall continue until the entire main is filled. The water shall remain in the system for a minimum of 24 hours. Each valve in the system being disinfected shall be opened and closed several times during the contact period to ensure it's proper disinfection. Following the 24-hour period, no less than 25-ppm chlorine residual shall remain in the system. If after the 24 hours, the residual solution contains less than 25-ppm chlorine respectively, flush the piping with potable water, and repeat the above procedures until the required residual chlorine levels are satisfied. The system shall then be flushed with clean water until the residual chlorine level is reduced to less than one (1) part per million (ppm). During the flushing period each valve and faucet shall be opened and closed several times. Samples of water in disinfected containers shall be obtained. The samples of water shall be tested for total coliform organisms (coliform bacteria, fecal coliform, streptococcal, and other bacteria) in accordance with AWWA-EWW; "Standard Methods for the Examination of Water and Wastewater." The testing method used shall be either the multiple-tube fermentation technique or the membrane-filter technique. Disinfection shall be repeated until tests indicate the absence of coliform organisms (zero mean coliform density per 100 milliliters) in the samples for at least a minimum of 2 full days. The system will not be accepted until satisfactory bacteriological results have been obtained. After flushing and disinfection, systems shall be prepared for testing by immediately filling water piping with clean, fresh potable water.

11.20 RADON PREVENTION AND TESTING

Each housing unit shall be constructed to include an active system for control of radon in the structure. The system shall be constructed in accordance with U.S. Army Corps of Engineers Technical Instructions, Indoor Radon Prevention and Mitigation (TI 810-91, 3 August 1998) and EPA "Model Standard and Techniques for Control of Radon in New Residential Buildings". Provide a sub-slab depressurization system with a natural draft using 3-inch PVC vent (suction) piping installed vertically to remove radon gases before they enter the housing unit. Multiple runs may be provided and connected to one common stack through the roof. Radon vent pipe is to be routed through attic in a location that will facilitate installation and maintenance of a permanently installed fan in this contract. The pipe can be embedded into the aggregate through the slab. The standpipe shall be extended vertically through the building floors. Terminating at least 12 inches above the surface of the roof at a location that is at least 10 feet away from any window or other opening into the conditioned spaces of the building, that is less than 2 feet below the exhaust point, and at least 10 feet from any adjoining or adjacent buildings. A rainproof installation above the roof shall be provided. A length of 3 in. diameter perforated pipe shall be installed horizontally beneath the sheeting and connected to a 3 inch "T" fitting with a vertical standpipe installed through the sheeting, serving each 1500 square feet of slab area. Provide electrical wiring to facilitate installation for the permanently installed fan and a system failure-warning device for visual display to the occupant. Location shall be in a utility or mechanical room. A light (LED) connected to the differential pressure switch signal across the fan shall activate the light bulb to illustrate no airflow.

a) After the building envelope is complete, and with all HVAC system(s) operating on normal cycles, the Contractor shall test all facilities for radon levels using Alpha Track Detectors for a 90-day test period. The tests shall be conducted by a measurement service provider designated as proficient with alpha Track Detectors through the U.S. EPA's Radon Proficiency Program in the National Radon Proficiency Listing. These results shall be provided to the Contracting Officer.

b) Any sump open to soil shall be covered with a gasketed or otherwise sealed lid to retard soil gas entry. (Note: When the sump is to be used as the suction point in an active sub-slab depressurization system, the lid should be designed to accommodate the vent pipe. If also intended as a floor drain, the lid shall also be equipped with a trapped inlet to handle any surface water on the slab.)

PART 12 - MAJOR APPLIANCES

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12 MAJOR APPLIANCES

12.1 GENERAL

The Contractor shall furnish major appliances in accordance with the Air Force Family Housing Guide and the following. Color of kitchen appliances, except disposals, shall be of matching finish, white in color. Appliance electrical requirements are provided in paragraph 14.11, Electrical Equipment Requirements.

12.2 REFRIGERATORS

Comply with UL 250; "Household Refrigerators and Freezers" and shall bear the EPA "Energy Star" certified label. Provide refrigerator with two doors with frost-proof top freezer, automatic defrosting, and automatic icemaker. Refrigerator shall have two vegetable bottom baskets, at least four adjustable shelves, and at least two shelves and egg container in door; freezer compartment shall contain separate interior shelves, multiple door shelves, and icemaker. Provide reversible (left swing and right swing interchangeable) doors. Refrigerators shall conform to the energy compliance standards of 10 CFR 430; "National Appliance Energy Conservation Act (NAECA) including those refrigerators manufactured before the code took effect The use of refrigerants with an Ozone Depletion Potential (ODP) of .055 or less shall be investigated and used when commercially available. Minimum refrigerator volume is 20.5-21.4 cu ft (GSA size I). Sizes given in the Air Force Family Housing Guide, Figure 4.23 shall be considered as minimum acceptable sizes. Products which define a level of acceptable quality and that are recommended for use include the "ED" series manufactured by Whirlpool Corporation.

12.3 FREEZERS

Provide space and electrical hook-ups for tenant-furnished/tenant-installed freezer. See PART 9 - UNIT HOUSING DESIGN AND CONSTRUCTION, paragraph 9.8.2.a).

12.4 DISHWASHERS

Dishwashers shall conform to UL 749; "Household Electric Dishwashers," under counter with drain, and shall be UL listed, electric type, sound insulated, with air gap, racks, lift-out utensil holder, multi-level spraying arms, detergent dispenser, rinse agent dispenser, push button controls. Unit shall be listed as "Energy Star" compliant and shall bear the "Energy Star" label. Units shall feature 5 cycles of operation, 3 levels of wash and a 3-hour possible wash delay. The automatic controls shall cycle through the Wash, Rinse, Dry / Heat, and Stop phases, and shall be capable of rinse and hold cycle as well as a no heat-drying feature. The unit shall contain instantaneous, or in-line, water heater booster, with automatic thermostat set for 140 degrees F. Rated energy use for standard capacity models will not exceed 620 kWh/yr. A heavy duty 120 V grounded plug and cord type connector is required. Unit shall have a 5-year warranty against leakage and the failure of any controls. Products which define a level of acceptable quality and that are recommended for use include the "DU" series as manufactured by Whirlpool Corporation.

12.5 GARBAGE DISPOSALS

Garbage disposals shall conform to UL 430; "Waste Disposers:" continuous feed, minimum 1/2 HP motor, stainless steel grinding elements, two 360-degree stainless steel swivel impellers, manual motor reset, and sound insulation. A heavy-duty 120 V grounded plug and cord type electrical connection is required. For the garbage disposals electrical service an under sink GFI outlet which is controlled by a sink

or wall mounted UL rated push-button momentary contact switch shall be provided. See also PART 11 – UNIT DESIGN - PLUMBING, paragraph 11.9.

12.6 RANGES AND OVENS

Ranges shall be free-standing unit, gas operated, 30 inches wide and provided with porcelain enamel cook-top, oven, clock and timer, oven light, and cooking surface light. Oven shall have black glass window door, broiler pan, and self-lock racks. Provide gas- ranges, 30-inch width, and freestanding type. Ranges shall have pilotless electronic ignition four sealed burners, and ovens shall have both broil and bake function. Ovens shall be self-cleaning.

Gas ranges shall have two, 6-inch and two, 8-inch burners, and AGA-approved electronic ignition. Gas ranges shall be in accordance with AGA Z21.1, "American National Standard for Household Cooking Gas Appliances." Products which define a level of acceptable quality and that are recommended for use include the "Gold" series manufactured by Whirlpool Corporation.

In units designated to be handicapped accessible or adaptable, ranges, ovens and cook tops shall comply with FED-STD-795, Sections 4.34.6.2, 4.34.6.3 and 4.34.6.7. Ensure that if ovens or cook tops have knee spaces underneath, then that they are insulated or otherwise protected on the exposed contact surfaces to prevent burns, abrasions, or electrical shock.

12.6.1 RANGE HOODS

Provide metal range hoods, the same length, color and finish as the range, with separately switched light and exhaust fan. The hood shall have a washable filter. The fan shall be two-speed or variable speed and shall have a capacity of not less than 50 cubic ft per minute per linear foot of range hood. The sound level shall not exceed 6 sones. Fan shall be ducted to the exterior and shall be provided with backdraft protection. See also, section 01000, Part 13 Unit Design – HVAC, paragraph 13.6 (b).

12.7 MICROWAVE OVENS

Microwave ovens are not required but may be provided by occupants. Provide space for occupant-furnished/occupant-installed microwave. A dedicated circuit shall be provided for a microwave oven in the kitchen.

Note: Built in Combination Microwave Ovens/Range Exhaust Fans for all housing units are considered betterments. See Section 01000, Part 1 for a complete listing of betterments.

12.8 GAS WATER HEATERS

See PART 11- UNIT DESIGN - PLUMBING, Paragraph WATER HEATERS.

12.9 CLOTHES WASHER/DRYERS

Provide space for **occupant-furnished/occupant- installed** clothes washer/dryer. Provide heavy duty grounding 120 V and 240 V receptacle outlets for clothes washer/dryer for a plug and cord type electrical connection. In addition to the electrical connection a gas connection shall also be provided for the dryer.

12.10 CEILING FANS/LIGHT FIXTURES

Ceiling fans/light fixtures shall be provided in the Family Room and Living Room. Support blocking and junction boxes shall be provided for their installation. See paragraph 14.7.2 for further requirements.

Ceiling fans/light fixtures including wall switches for all bedrooms are considered betterment's to the family housing units.

12.11 DOOR OPENER

Provide an automatic garage door opener with safety sensors, instant reverse and overload protection. A 1/3 HP minimum motor shall be provided for single garage door openings and a 1/2 HP minimum motor shall be provided for double garage door openings. Motor shall be removable without affecting the limit switches. Opener shall be provided with adjustable limit switch settings, two remote controls, and a wall mounted push button control, which is located near the door from the garage into the housing unit. A plug connector is required. Provide a flush mounted ceiling electrical outlet for the garage door opener. Two garage door remote controls shall be provided per door opener.

PART 13 - UNIT DESIGN - HVAC

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13 UNIT DESIGN - HVAC

13.1 HVAC DESIGN

Heat gain and loss calculations shall be, as a minimum, in accordance with of the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), "1985-Handbook of Fundamentals" and ASHRAE 90.2P; "Energy Efficient Design of New Low-Rise Residential Buildings." Designs shall be based on the weather data shown in Table 13-1. Air-cooled condenser shall be selected to meet the calculated cooling load at an ambient temperature of 95 degrees Fahrenheit (F.).

a. Computer-generated load calculations shall be provided at the 100% design submittal after contract award, and shall include complete input and output summaries **(see Section 1332 SUBMITTALS FOR DESIGN)**.

Table 13-1 Design Weather Data

Type of Design / Design Information	Inch-pound
Site Elevation 3165 feet above sea level	Derate flow rates for elevation
Heating	
Indoor Design Temperature	72 degrees F
Outdoor Design Temperature	-20 degrees F
Annual Heating Degree Days	**6213 @ 65 deg. F**
Cooling	
Indoor Design Temperature	**76 degrees F**
Outdoor Design Dry Bulb Temperature	**92** degrees F
Outdoor Design Wet Bulb Temperature	**65** degrees F

13.1.1 LOAD CALCULATIONS

Computer generated load calculations shall be performed for each possible orientation up to four representative orientations for each building type included in the project(s) and provided at the 100% design submittal after contract award (**see Section 1332 SUBMITTALS FOR DESIGN**). Room airflow requirements shall be computed based on the individual room loads. However, the minimum acceptable airflow shall be 0.5 cubic feet per minute per square feet (cfm/ft^2) for all spaces. The amount of air delivered to each room shall be enough to satisfy the design cooling requirements, if greater than that required to satisfy the heating requirement. Load calculations shall include a 10% safety factor for cooling and a 30% safety factor for heating. Natural infiltration rates of shall be determined using the crack method. The designs for each individual housing unit shall be based on the heating and cooling loads as well as room airflow requirements computed for the building type(s) and orientation(s), which it most closely matches. Heating load calculations shall be made without regards for people, lights, equipment, solar wall,

roof gains or passive solar gains. Table 13-2 below identifies the internal loads, which shall be included in the computerized cooling load calculations.

TABLE 13-2 - INTERNAL HEATING AND COOLING LOADS

INTERNAL LOAD DESCRIPTION		ANTICIPATED INTERNAL LOADS
Occupancy	2BR	230 British thermal units per hour (Btuh) per person
	3BR	230 Btuh per person
	4BR	230 Btuh per person
Hours of Use		
Additional Sensible and Latent Loads		**800 btuh for laundry and kitchen**
Hours of Use		
Maximum Overhead Lighting Level		**Actual values**
Maximum Task Lighting Level		**Actual values**

13.2 EQUIPMENT SAFETY AND EFFICIENCIES

All materials and equipment shall be the standard cataloged product of manufacturers regularly engaged in production of such materials and equipment, and shall be the manufacturers' latest standard design. Each major component of the heating and cooling system(s) shall have the manufacturers' information on a plate secured to the equipment. All like equipment and accessories shall be from a single manufacturer. 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.

13.2.1 EQUIPMENT

Equipment shall comply with the requirements of the following criteria: American Gas Association (AGA), American National Standards Institute (ANSI), Air Conditioning and Refrigeration Institute (ARI), American Society for Testing and Materials (ASTM), Gas Appliance Manufacturers Association (GAMA), National Electric Manufacturers Association (NEMA), National Fire Protection Association (NFPA), Underwriters Laboratories, Inc. (UL), International Mechanical Code (IMC), ASHRAE 90.2P; "Energy Efficient Design of New Low-Rise Residential Buildings" or other national trade associations as applicable.

13.2.2 EFFICIENCIES

Equipment efficiencies as listed in Table 13-3 are minimum acceptable levels. Energy conservation as it relates to equipment operating costs will be considered in the evaluation process.

Additional consideration in the technical evaluation will be given to designs, which include higher than minimum efficient equipment.

TABLE 13-3 – MINIMUM EQUIPMENT EFFICIENCIES

		Natural Gas fired equip				Electric cooling equip
A.F.U.E. Efficiency		92% minimum				
SEER (Regions 1-5)						12

13.3 HEATING AND COOLING SYSTEMS

Room unit heaters, space heaters, room (window) or through-the-wall air conditioning units, floor furnaces, gravity warm air systems, evaporative coolers, heat pumps, and electric resistance heaters or heat lamps are not permitted. Also, crawl space units are unacceptable. Each housing unit shall be provided with central heating and air conditioning system(s) (forced warm air furnaces). Air conditioning system(s) shall be sized to meet the total loads determined by computer calculations and matched to the furnace airflow capacities. Where duplex units are provided each occupant's or family housing unit shall be provided with central heating and air conditioning system(s). Supply and return duct distribution systems shall be designed, installed, tested, adjusted, and balanced to distribute heat and cooling to all habitable rooms, artic recreation rooms, crawl spaces, basements, as well as bath, toilet or restrooms, in proportion to the calculated load requirements of these spaces. Return air grilles shall be provided on each floor of the living spaces. Fans in air handlers and furnaces shall be multi-speed, direct drive types. System(s) installation shall conform to SHEET METAL & AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA); "Installation Standards for Residential Heating and Air Conditioning Systems" except as altered by this document and NFPA 90A, 90B, and 91.

13.3.1 MECHANICAL SPACE

Mechanical space shall be provided to house all mechanical equipment including a future water softener system. Exterior air conditioning units shall be concrete pad-mounted, located in the rear of the housing units. Effort shall be made to locate the unit(s) out of the occupant's direct line of sight (i.e. avoid placement under windows, etc.). However, the primary concern shall be coordination with the mechanical area location. Mechanical equipment (e.g. furnace and hot water heater) shall be located in an internally accessible room with a floor drain, arranged to allow for ease of maintenance, and for proper venting (reference International Residential Code (IRC), chapter 13, Appliance Access). This room shall be provided with a light and electrical receptacle. This room shall be in the basement of units provided with basements. This internal room shall not be located in, or accessed from, the garage area of the housing unit. The mechanical equipment room layouts shall be provided with ample floor space to allow for unobstructed access to accommodate routine servicing and maintenance of equipment and to have sufficient headroom to accommodate required equipment. Provisions for installation, removal, and future replacement of equipment shall be coordinated with the architectural design. 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 unfinished areas, and the equipment room. See paragraph 9.5.2 for additional requirements for mechanical spaces containing fuel-fired heating equipment.

13.3.2 FORCED WARM AIR SYSTEMS

Warm air furnaces shall be induced combustion, upflow (downflow is acceptable only when no basement is provided) natural gas high efficiency condensing furnaces. Furnaces shall be equipped with AGA approved electronic pilotless ignition. Natural gas furnaces shall be equipped direct vents with a flue to exhaust flue

gases through the roof with concentric terminator in accordance with the manufacturer's instructions. Flue penetration through roof shall be located on the backside of the roof. Combustion air shall ducted from the roof using a concentric terminator in accordance with International Mechanical Code (IMC), IRC or model codes. Combustion air shall be provided in accordance with SHEET METAL & AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA); "Installation Standards for Residential Systems." And furnace manufacturer's recommendations. Furnaces shall be equipped with centrifugal fan, disposable filters (filters shall be easily accessible to the occupants), controls, and transformer. Fans shall be multi-speed, direct-drive types. It shall be possible to service and replace all controls and internal components from one side of the furnace(s). Heat exchangers shall be guaranteed for a minimum service life of 20 years. Furnaces shall be equipped with a cooling evaporator coil by the same manufacturer, matched to the selected air conditioning equipment and capable of operating at high, medium and low speeds in addition to being turned off.

13.3.3 SPLIT SYSTEM AIR CONDITIONING

13.3.3.1 Equipment

Exterior air conditioning units shall be concrete pad-mounted, located in the rear of the housing units. Effort shall be made to locate the unit(s) out of the occupant's direct line of sight (i.e. avoid placement under windows, etc.) Electric exterior air conditioning equipment shall consist of air-cooled condensing unit(s) an indoor evaporator(s) as matched components with the furnaces, all by the same manufacturer,. Refrigerants used shall have an Ozone Depletion Potential (ODP) equal to zero. The condensing units shall contain, as a minimum, the features indicated in Table 13-4. Equipment shall be sized to meet the total loads determined by computer calculations. Equipment may be oversized to no more than 125 percent (%) of the computer generated loads. Fans shall be multi-speed, direct drive types.

TABLE 13-4 – SPLIT SYSTEM AIR CONDITIONING FEATURES

High and low pressure compressor protection.
Filter-drier.
Hermetically sealed compressor with built-in overloads and locked rotor protection.
Electric crankcase heater(s).
Factory installed anti-short-cycle timer.
Testing and charging refrigerant connections.
Compressor guaranteed for a minimum service life of 5 years.
Fan and coil hail guards. Manufacturer's 10-year extended warranty. Minimum 12 SEER rating of condensing unit and matched coil.

13.3.3.2 Evaporator Coils

Furnaces shall be equipped with a direct expansion (DX) indoor evaporator cooling coil supplied by the same manufacturer of the furnace and exterior air-cooled condensing unit. The evaporator coil shall be provided with a liquid strainer, expansion device, pre-insulated housing, copper coil, and condensate drain

pan. Cooling maximum coil face velocity shall be limited to 550 feet per minute (fpm) to preclude moisture carryover. Condensate drain lines shall be one size larger than the drain pan connection, be properly trapped, and indirectly piped and secured to a floor drain.

a) Refrigerant lines running between the condensing units and the evaporators shall be concealed, except in the furnace or mechanical rooms.

13.3.3.3 Condensing Units

The condensing units and matched coils shall deliver a Seasonal Energy Efficiency Rating (SEER), consistent with the minimum requirements shown in Table 13-3. The condensing units shall be installed in accordance with the manufacturer's recommendations.

13.3.4 FILTERS

Provide a pleated 1-inch panel filter for each furnace, sized for and installed in the return air system**.** No filters shall be located within the furnace's enclosure. Filters shall be rated for 20% efficiency as determined by ASHRAE 52.1 "Gravimetric and Dust Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter." All filters shall be easily accessible for changing and maintenance. Kitchen exhaust hoods shall be provided with washable meshscreen grease filters sized to fit the exhaust duct.

13.4 AIR DISTRIBUTION

For a given building type(s), a single duct layout may be used regardless of orientation(s), provided that the system(s) is sized to provide the required airflow for each room at its worst case orientation. Balancing dampers shall then be used to reduce airflow to the appropriate level as required. Permanent access to dampers shall be provided. Provide system(s) conforming to the recommendations of SHEET METAL & AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA), "Installation Standards for Residential Heating and Cooling Systems" except as altered by this document. Supply and return duct distribution systems shall be designed, installed, balanced and adjusted to distribute heat and cooling to all habitable rooms, as well as to bath, toilet, restroom and basements or crawl spaces in proportion to the calculated heat/cooling losses/gains of these spaces

The design and installation of the supply and return ductwork within the units is an item of prime concern with respect to the energy efficient operation of the housing unit as a whole. All ductwork in finished spaces shall be concealed and located above ceilings, in walls, or below floor of upper stories (ductwork shall not be located in the attic). No portion of the building construction (such as joist space in a floor or ceiling, wall stud space, etc.) shall be used as a duct. Sub-slab and intra-slab ductwork is prohibited.

For two-floor housing units with a single air conditioning unit, provide separate, main supply ducts with volume control dampers for each floor. These main ducts shall be run directly from the air handler or furnace to the appropriate building level. As a minimum, provide a separate ducted return for each floor level. Two-floor housing units with 1,000 feet squared ($ft^{2)}$ or greater net floor area on each floor shall be provided with a separate heating and cooling unit and supply and return ducted systems for each floor. Main supply and return ducts shall have adjustable dampers for balancing air system of each level. In addition, manual volume dampers shall be provided in each branch duct at the supply registers. Locate branch dampers to allow access and adjustment through the register

a. For units with basements or crawl spaces, the main supply duct run serving the first floor may also serve the basement or crawl spaces.
b. Maximum velocity in supply ducts shall be limited to 900 fpm for mains and 600 fpm for branches.
c. Return air ductwork shall be sized for a maximum velocity of 700 fpm.

13.4.1 SUPPLY REGISTERS

Supply registers shall be steel, residential style. Plastic units are prohibited. Registers shall have factory finish matched to installed wall, floor, or ceiling color. Wall and ceiling mounted units shall be installed with rims tight against wall or ceiling with sponge-rubber gaskets. Wall units shall be installed at least 6 inches below the ceiling.

a) Wall, floor and ceiling registers shall be located to ensure that the air distribution will completely cover all surfaces of exterior walls with a blanket of conditioned air. At least one register shall be provided in each habitable room including bath, toilet or restroom and basements or crawl spaces. Registers shall be lever operated resident accessible, and have louvered faces. Core velocity shall be limited to 600 fpm maximum, with a maximum pressure drop of 0.1-inch water. Registers shall be sized to distribute the required quantity of air evenly over the space intended without causing noticeable drafts, air movement faster than 50 fpm in the occupied zone, or causing dead spots anywhere in the conditioned space. Airflow from any single diffuser shall be limited to 200 cubic feet per minute (cfm) maximum.

13.4.2 RETURN AND EXHAUST GRILLES

Return and exhaust grilles shall be steel, residential style. Plastic units are prohibited. Grilles shall have factory finish matched to installed wall, floor, or ceiling color. Wall and ceiling mounted units shall be installed with rims tight against wall or ceiling with sponge-rubber gaskets. Wall exhaust units shall be installed at least 6 inches below the ceiling.

a) Grilles shall be fixed horizontal or vertical louver type similar in appearance to the supply register face. Plastic units are prohibited. At least one return grille shall be provided for each floor level. Core velocity shall be limited to 400 fpm maximum, with a maximum pressure drop of 0.06-inch water. Grilles shall be provided with sponge-rubber gasket between flanges walls or ceilings. Wall return grilles shall be located at least 6 inches above the finished floors. Return grilles shall be located in hallways, finished basements, or other normally unoccupied spaces to minimize the sound level in occupied spaces.

13.4.3 DUCTWORK

Supply, return and exhaust ductwork shall be externally insulated in unconditioned spaces and unheated mechanical rooms with sheet metal (no fiberboard or flexible duct. metal or otherwise is allowed). For supply, return and exhaust ductwork system designs, which place all the ductwork within the conditioned envelope of the structure, no ductwork insulation will be required. Sub-slab and intra-slab ductwork is also prohibited. Volume dampers shall be provided at each branch take-off. All ductwork shall be concealed and located above the basement ceilings, in walls, in crawl spaces or below floors of upper stories (ductwork shall not be located in the attics). Permanent access to dampers shall be provided. No portion of the building construction (i.e. joist space in a floor or ceiling, wall stud space, etc.) shall be used as a duct.

a) Fresh air and combustion air ducts shall be airtight with no visible or audible leaks and sealed for class A construction to ensure quiet, economical system performance.

b) Ductwork in conditioned spaces shall be constructed for a 1 inch static pressure construction class with seal class C, as described in the SHEET METAL & AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA); HVAC Duct Construction Standard; “HVAC Duct Construction Standards - Metal and Flexible,” unless a higher pressure class and/or seal class is required by actual system operating conditions.

c) Ductwork in unconditioned spaces shall be constructed for a 2-inch static pressure construction class with seal class A, unless a higher-pressure class is required by actual system operating conditions.

d) All round duct seams and joints shall be sealed using duct mastic. Tape shall not be used as a means for sealing ductwork.

e) All supply and return air ductwork shall be sheet metal, no flexible duct, metal or otherwise or fiberboard is allowed. Systems comprised entirely of flexible ductwork with distribution boxes are prohibited and flexible duct outside of systems with distribution boxes is not allowed.

f) Combustion air duct shall be provided in accordance with SHEET METAL & AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA); "Installation Standards for Residential Systems." Installed in accordance with the equipment manufacturer's instructions and as specified elsewhere.

13.5 THERMOSTATS

Thermostats shall be located on interior partitions, approximately 5 feet above the finished floor. Accessible housing units shall have the thermostat located on interior partitions, approximately 4 feet above the finished floor. Locating a thermostat on the wall adjacent to a stairway, on an exterior wall or where it is subject to unrepresentative temperatures is unacceptable. Also, the base does not want thermostats located in the hallways, as they tend to become damaged with people moving in and out, which happens more frequently.

13.5.1 OPERATION

Low voltage type standard thermostats shall be provided for each furnace unit. Thermostats shall be manually operated single set point for heating and cooling and shall contain a switch for summer or winter settings. Thermostats shall have a switching sub-base that prevents simultaneous heating and cooling, and requires manual switching between heating and cooling modes. The sub-base will also include a fan switch to allow whole-house air circulation when the heating and cooling needs are satisfied. Thermostats shall not have batteries as their primary power source.

13.6 EXHAUST FANS

The design of all systems shall comply with the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Handbooks, ASHRAE Standard 62, and to the requirements of NFPA Standards Nos. 90A, 90B, and 91.

13.6.1 GENERAL

All baths, toilet rooms, laundry rooms, and kitchens shall be provided with individual exhaust fans, regardless of whether operable windows are provided in the rooms. Fans shall be centrifugal type, tested and rated in accordance with AMCA 210, or HVI, and shall operate with 120-volt, 60 hertz, single-phase power supply. Exhaust fans shall not be located in attic spaces, nor shall exterior wall and roof mounted exhaust fans be used. Exhaust fans shall be ducted directly to the building exterior through a sidewall or soffit. Venting through the roof, into vented joist spaces, or into attic spaces is not permitted. Exhaust fans shall not discharge near air-conditioning condensing units, entry doors, windows, patios or porches, balances or garages. Exhaust fans shall be complete with self-closing back draft dampers, and weatherproof wall caps or soffit vents. Exhaust caps and vents shall be provided with backdraft dampers and shall be incorporated into the exterior façade detailing to form an integral part of the overall building aesthetics and shall be an inconspicuous part of the overall building appearance. The total exhaust rate should equal ducted fresh air rate required at the furnace by other paragraphs.

13.6.2 BATH, TOILET, AND LAUNDRY ROOM EXHAUST FANS

Bath, toilet, and laundry room exhaust fans shall be of the centrifugal type, ceiling mounted, and shall be sized to provide not less than 10 air changes per hour (minimum 75 cfm) in the space served. Each fan shall have a removable front grille and be controlled by a dedicated wall switch. Exhaust fans shall be of the low noise type with a maximum installed noise level of 2.5 sones. Exhaust fan ductwork shall be round sheet metal, except aluminum flex type maximum of 2 feet ducting may be used when run exposed in attic spaces to eave vents. When running ducts in attic spaces, the duct shall be insulated and sloped away from the exhaust fan to prevent condensation from draining back to the fan. All joints in round sheet metal ductwork shall be sealed with aluminum tape.

13.6.3 KITCHEN RANGE HOODS

Each kitchen shall be provided with a metal exhaust range hood the same length and finish as the range, and mounted directly above the range. Range hoods shall be provided with a High-Low-Off manual fan speed selector switch, a separate On-Off light switch, and a washable mesh-screen grease filter that is easily removable for cleaning. The range hood fans shall have a minimum capacity of approximately 160-cfm at high speed and shall be of the low noise type with a maximum installed noise level of 6 sones. Hood exhaust shall be ducted and discharged directly to the outside and provided with backdraft protection. All ductwork shall be sheet metal, rated for residential kitchen exhaust use and installed in accordance with applicable building codes. Plastic or flexible metal ductwork shall not be used.

13.7 DRYER VENTS

A 4-inch diameter dryer vent stub out shall provide connection to each occupant-owned dryer (one (1) dryer per vent). The vents piping to the stub-out shall be concealed, and shall be rigid aluminum with exterior riveted and tape-sealed joints, and shall discharge to the wall cap and backdraft damper. Vent pipes shall be a maximum of 20 ft long, with no more than three right angle elbows (with minimum radius of 6 inches), and have a maximum vertical run of 12 ft. Dryer vents shall not exhaust through the roof and shall not discharge near the air conditioning condensing units, windows, balconies, entry doors, patio, porches or garages. Dryer vents shall not run through non-accessible spaces, roofs or garages.

13.8 INSULATION

Insulation systems shall, unless otherwise stated herein, be installed in accordance with the Midwest Insulation Contractors Association (MICA) Manual.

a) Refrigerant suction lines shall be insulated with a minimum of 1-inch thick cellular glass or unicellular foam pipe insulation (R = 4.0 hr/squared/btuh with an external surface permeance not exceeding 0.05 perms in accordance with ASTM E 96). Exterior refrigerant line insulation shall be encased in either an aluminum or PVC jacket to prevent damage.

b) Provide a minimum of 2-inch thick mineral fiber insulation (or other listed insulation with an equivalent R-value) on the exterior of exhaust, supply; and return ducts in vertical duct chases or other unconditioned spaces. A minimum of 1-inch thick mineral fiber with vapor barrier shall be installed on any exhaust ductwork located in attic spaces. Insulation shall be faced with a vapor barrier material having a performance rating not to exceed 1.0 permanence (perm). Insulation, vapor barrier, and closure systems shall be non-combustible as defined in NFPA 255; "Test of Surface Burning Characteristics of Building Materials;" with a flame-spread rating of not more than 25, and a smoke development rating of not more than 50, as defined in ASTM E-84; "Surface Burning Characteristics of Building Materials."

c) Short runs of return air duct 5 feet or less, which directly precedes the furnace, shall be acoustically lined to reduce noise. Return air grille plenums and the first 5 feet of return duct associated with shall also be acoustically lined.

13.9 TESTING, ADJUSTING, AND BALANCING (TAB) & TAB VERIFICATION

13.9.1 TESTING, ADJUSTING, AND BALANCING (TAB)

The Contractor will be required to test the prototype unit(s) to ascertain the flowrate settings from the systems as follows: Adjusting and balancing of each housing unit prototype shall be the Contractor's responsibility. Alternate balancing shall be provided for the remaining units.

a) Qualifications:

An independent firm certified for testing by the Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB) shall accomplish testing.

b) Procedures:

TAB shall be performed by using AABC or NEBB certified technicians and/or other technical personnel under direct supervision of the certified technicians. The selected standard shall be used throughout the project(s). The TAB firm shall be a subcontractor of the prime Contractor, and shall report to and be paid by the prime Contractor. The TAB services are to assist the prime Contractor in performing the quality oversight for which it is responsible. Instrumentation accuracy shall be in accordance with the standard selected. All recommendations and suggested practices under the selected testing standard shall be followed under which the TAB Firm's qualifications are approved. All recommendations and suggested practices contained in the TAB standard shall be considered mandatory. Prior to testing, adjusting, and balancing, the Contractor shall verify that the systems have been installed and are operating as specified.

c) Design Review:

Prior to construction, the TAB firm shall review the plans and specifications and advise the Contractor of any deficiencies that would prevent the HVAC systems from effectively operating or prevent the effective and accurate TAB of the systems(s).

d) TAB:

Where specific systems require special or additional procedures for testing, such procedures shall be in accordance with the standard selected. Approved detailed drawings and all other data required for each system and/or component to be tested shall be made available at the job site during the entire testing effort. Testing shall not commence until approved by the Contracting Officer. The facilities shall be essentially complete with final ceilings, walls, windows, doors, and partitions in place. Doors and windows surrounding each area to be balanced shall be closed during testing and balancing operations. Air systems, hydronic systems, and exhaust fans shall be complete and operable. All data, including deficiencies encountered and corrective action taken, shall be recorded. Following final acceptance of certified reports by the Contracting Officer, the setting of all HVAC adjustment devices shall be permanently marked by the Contractor's balancing engineer so that adjustment can be restored if disturbed at any time. All housing units' prototypes shall be tested, adjusted, and balanced. In lieu of performing actual TAB readings on all units, the Balancing Contractor has the option of alternate balancing on units that have like ductwork configurations as the units that have had TAB performed.

e) Alternate TAB:

Alternate balancing may be accomplished by placing the like unit balancing dampers in the same position as placed for the TAB read units. The use of alternate balancing, however, does not relieve the Contractor's responsibility of proper balancing of all prototype units and to meet the requirements of TAB verification. All TAB data, including deficiencies encountered and corrective action taken, shall be recorded. The setting of all HVAC adjustment devices shall be permanently marked by the balancing Firm so that adjustment can be restored if disturbed at any time.

13.11.2 TAB Verification

Following Testing, Adjusting and Balancing, the proto-type units and setting and adjusting to these permanent setting the other housing units, the Contractor shall perform TAB verification on 10% of the project(s) other buildings randomly selected by the Contracting Officer. If buildings are to be turned over in phases, TAB verification shall be performed on 10% of the buildings completed in each phase. No additional TAB verification will be required if at least 90% of the verified buildings pass the TAB requirements. If less than 90% of the TAB tested buildings pass; an additional 10% of the project(s) buildings shall be tested. This process shall continue until 90% of the total number of tested buildings pass TAB verification testing. The Contractor shall correct all housing units not found in compliance, and shall be responsible for all labor and materials required for this effort. AABC MN-1; "National Standards," or NEBB-01; "Procedural Standards for Testing, Adjusting, Balancing of Environmental Systems" shall be used as the standard for providing testing for TAB verification of air and water systems.

13.10 DUCT TIGHTNESS TESTING REQUIREMENTS

The installation of the supply and return ductwork within the units is an item of prime concern with respect to the energy efficient operation of the housing unit as a whole. With that consideration in mind, for heating and air conditioning designs which include ductwork outside of the conditioned envelope, the Contractor will be required to test the prototype units to ascertain the leakage levels from the ductwork in accordance with the following requirements.

For system designs, which place all the ductwork within the conditioned envelope of the structure, no ductwork tightness testing will be required.

13.10.1 TESTING

Duct tightness testing shall ensure that the leakage rate from ductwork (that is not entirely within the conditioned envelope) shall not exceed 0.03 cfm/ft^2. If the prototype units fail to meet this requirement, the ductwork installation shall be examined, corrections made, and the test redone until the installation passes this requirement. No ductwork systems may be installed in other units until the prototype unit's ductwork systems have been validated. Several methods to accomplish this testing are acceptable:

a) Testing may be done in accordance with ASTM Standard E 1554-94; "Determining External Air Leakage of Air Distribution Systems by Fan Pressurization." This method describes the process and methodology required to accomplish basically a 'blower door subtraction' method of duct tightness testing.

b) Testing may also be accomplished utilizing "Duct Blaster" methodologies and pressurizing the ductwork to 0.1 inch of water.

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14 UNIT DESIGN - ELECTRICAL

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14 UNIT DESIGN - ELECTRICAL

14.1 GENERAL

The electrical system shall be designed in compliance with the rules and recommendations of ANSI C2, National Electrical Safety Code; Illuminating Engineering Society (IES) Standards; NFPA 70, National Electrical Code (NEC); NFPA 101, Life Safety Code; NFPA 72, National Fire Alarm Code, and any other applicable model codes, whichever is more stringent.

All equipment, materials, fixtures, and other appurtenances shall be suitable for the intended application, and shall conform to and be installed per the National Electrical Manufacturer's Association, American National Standards Institute, Institute of Electrical and Electronics Engineers, Underwriters' Laboratories, and all other applicable standards/regulations/codes. See **PART 8 – SITE UTILITIES** for exterior electrical requirements.

14.2 SERVICE ENTRANCE

See **PART 8 – SITE UTILITIES** for service entrance requirements.

14.3 PANEL BOARD REQUIREMENTS

14.3.1 PANEL BOARDS

Panel boards (minimum 200amp panel at each unit is required) shall be located inside the housing units in the utility or laundry room and shall be readily accessible to the housing unit occupants. Each unit's panel board shall have a 200A/2 pole main circuit breaker and minimum 24-pole space with a minimum of 12-20A/1 pole plug-in circuit breakers. Locate the service panel within the dwelling unit, but not in areas such as living rooms, dining rooms, bedrooms, or behind clothes in closets.

Provide main circuit breaker in the interior main panel for each housing unit, sized in accordance with the NEC. Panel boards shall be painted galvanized steel and furnished with main breakers. Panel board doors shall be flush one-piece fronts and dead front. Offset a minimum of 16 inches horizontally back-to-back panel boards. No recessed panel boards are to be located on common walls or firewalls. A minimum of one spare circuit space in the panel shall be provided per housing unit.

Directory cards shall be typewritten. Hand lettering will not be acceptable. Panel boards shall be recessed if in finished spaces.

14.3.2 SECONDARY OVERCURRENT DEVICES & CONDUCTORS

All secondary overcurrent devices shall be of the circuit breaker type. All secondary conductors shall be copper. Provide a surge suppresser at the service entrance.

Motors for air conditioning units to be provided with overload protection and disconnecting means conforming to the NEC.

14.4 BRANCH CIRCUITS

Maximum use shall be made of nonmetallic-sheathed cable for branch circuit wiring. All nonmetallic sheathed cable shall be installed concealed or in conduit. No exposed nonmetallic-sheathed cable shall be allowed. Lighting and convenience receptacle outlets shall be on separate circuits.

Branch circuit conductors shall be copper with minimum wire size designed per National Electrical Code. Interior feeders shall be copper. Conductors in housing units shall be installed above ceilings or in walls. Make sure that conductor installation has no staples or tacks placed in or on the conductors that cause a puncture or flattening to the cable. Do not run wiring in concrete slab on grade. Nonmetallic-sheathed cables (Type NM) with ground conductor and metallic armored cables may be installed in areas permitted per NEC.

All wiring shall be concealed except as required for connection to equipment. Convenience receptacle outlets on opposite sides of common walls shall be offset. Convenience receptacle outlets, device boxes and switch boxes shall be recessed.

14.5 RECEPTACLE OUTLETS

Provide a minimum of one (GFCI) duplex receptacle outlet in each unit's front and rear entrance, garage, and patio area(s), and as required by code in bathrooms. Arc fault circuit interrupter (AFCI) protection will be provided for all branch circuits in all bedrooms per NEC. Minimum of two (GFCI) duplex receptacle outlets (20A) shall be provided above the kitchen counter top. Two utility circuits shall be provided in the kitchen area for convenience duplex receptacle outlets for small appliances serving the kitchen, and dining area. Duplex receptacle outlets for general-purpose use shall be 15A minimum, 125V, 2-pole 3-wire grounding type. Receptacle outlets on common walls shall be offset to maintain integrity of the firewall and sound deadening rating of the wall.

Receptacle outlets in kitchens, bathrooms, laundry room, garages, patios, crawl space, front entrance shall be provided with ground fault circuit interrupter (GFCI) outlets. One quad-plex GFCI outlet shall be provided above the vanity counter tops in each bathroom. Bathroom exhaust fan shall be switched separately from the recessed ceiling light fixture.

Contractor shall provide an 115V receptacle outlet for an occupant-owned freezer. Locate adjacent to the kitchen or in area such as the utility room. All outlets will have a ground wire in addition to neutral and hot legs.

A wall switch above and to the right of the kitchen sink shall control power to an electrical outlet under the sink provided for the garbage disposal. An under counter (non-switched) outlet shall be provided for the dishwasher. Provide an electric cord and plug on each garbage disposal, dishwasher and range. See **PART 12 – MAJOR APPLIANCES** for additional requirements.

14.5.1 CONVENIENCE RECEPTACLE OUTLETS

In addition to receptacle outlets required by NEC, provide convenience duplex receptacle outlets in the following areas:

a) Utility room and Laundry room. Provide a minimum of one (GFCI) duplex outlet in addition to the washer and dryer requirements.

b) Hallway outside bedrooms.

c) Provide a convenience duplex receptacle outlet behind gas ranges to supply power for the range clock, timer, and lights.

14.5.2 SPECIAL RECEPTACLE OUTLETS

Provide 240 V receptacle outlet for the electric clothes dryer. Provide a separate, dedicated branch circuit for the clothes dryer, washer, microwave, dishwasher, garbage disposal, freezer, furnace or air-handling unit, and air conditioning unit.

14.6 LIGHT FIXTURE STYLE

The architectural style of the family housing units will conform to the "Prairie Style" design character. In selecting light fixtures, the primary characteristics we would look for are the "low horizontal lines", the "absence of traditional decorations" (such as floral patterns, ripples, scalloped edges, scrollwork, classical bases and fluted surfaces). The look of "leaded glass" dividers, "rectangular" shapes, and other geometric shapes might also be used, but never dominate. The appearance would also not tend toward the sculpted or streamlined effect where one portion would flow into another. The parts of the light fixture would tend to look more as though it was fabricated of multiple distinct parts. When a curved section was used, it was almost always very shallow and horizontally stretched with a simple smooth, matt or textured surface. If a sphere was used, it was always a small component of a larger design. A more prominent fixture would typically be made up of a box shape with each face made up of multiple rectangular pieces and attached to a simple box base or an extremely plain shallow round base. A more elaborate fixture might combine this with some curved element the seemed to intersect with the boxed element. Or a larger box base might lead to some small simple spheres that hugged the surface of the ceiling to keep the horizontal look. A less prominent fixture might use a very shallow curved section set so that the base was nearly invisible, again to keep a horizontal look that hugged the ceiling. Another prairie style distinctive is the use of matt finished metal, often in a darker color, instead of brightly polished brass or nickel-chromium.

14.7 EXTERIOR LIGHTING

Light fixtures located on the exterior of the family housing units will conform to the "Prairie Style" design character. Provide energy efficient high quality lighting for each housing unit. The minimum efficiency standard for lighting is 50 lumens/watt. This efficiency can be achieved with fluorescent and compact fluorescent lighting. Lighting must also be color corrected with a Color Rendering Index (CRI) of 60 or better. Light fixtures at entry and patio areas shall be wall-switched from the housing unit interior. Provide a minimum of one lighting fixture at each entrance. In addition to being wall-switched, these lights shall be controlled by photocell, activated by minimum light levels of 0.5 foot-candle.

Exterior lights shall be provided as a minimum at the main and rear entrance, garage door, and rear patio door. Wall switched lighting will be provided near the main and rear entrance to control exterior lights. Each individual unit will control it's own exterior light fixtures located on housing units.

14.7.1 ILLUMINATED HOUSE NUMBERS

Provide exterior wall mounted light fixture with integral house unit numbers. The base will provide the style of lighted house numbers. The type fixture shall have the address of the housing unit on the front lens. The fixture shall be on the same circuit as the front entry light fixture connected ahead of local switching and shall turn on automatically at dusk and turn off at dawn using a photocell that activates by minimum ambient light levels of 0.5 foot-candle. See **PART 9 – HOUSING UNIT**

DESIGN/CONSTRUCTION, paragraph BUILDING SIGNAGE and MAILBOXES for additional requirements regarding housing unit numbers.

14.8 INTERIOR LIGHTING

14.8.1 EFFICIENCY

Interior lighting will be both efficient and color corrected. Fluorescent fixtures shall be used wherever possible. There can be no possibility of removing a compact fluorescent and replacing it with an incandescent. Color Rendering Index (CRI) of 85 or better and a standard lighting color of 3500 K are required. As part of the submittal, contractor is to provide product data and model number of items to be supplied. Minimum efficiency standards for lighting are as follows:

a) Fluorescent tubes 4 ft and longer: 90 lumens/watt.

b) Fluorescent tubes less than 4 ft: 80 lumens/watt.

c) Compact fluorescent lamps: 50 lumens/watt.

14.8.2 LOCATIONS

Light fixtures within the units will conform to the "Prairie Style" design character of the family housing units and be located in all rooms except the family and living rooms. A list of fixture types have been provided in paragraph **LIGHT FIXTURE TYPES** as an example of the style and level of quality to be provided. Changes to finish and glass will and can be made to accommodate the interior design. Equals will be submitted for approval. Ceiling fans/light fixtures shall be provided in the family room and living room. Provide proper bracing for ceiling junction boxes to support ceiling fans. Provide wiring for ceiling fan/light fixture including wall switch. Interior lighting controls will be provided with switches. Provide a switch at the top and bottom of the stairs to control the light fixture at the top and at the bottom of the stairway.

As a minimum, provide wall-switched light fixtures in the kitchen, dining room, family room, living room, all bedrooms, all closets, bathrooms, halls, stairs, garage, bulk storage areas, laundry rooms, crawl spaces, and utility rooms. In the kitchen area, provide a central overhead fluorescent light fixture for general illumination. The kitchen sink shall have a separately switched down light fixture located above the sink. Wall-switch operated wall-mounted lights located above the mirror over the lavatory shall be provided in bathrooms and half-baths. Provide a recessed ceiling mounted light fixture in addition to the light fixture over the vanity in all bathrooms. Exhaust fans in bathrooms and half-baths shall be separately switched from the light fixtures. Additional light fixtures shall be provided in rooms whose configuration requires them for adequate task lighting.

Interior and exterior bulk storage rooms shall be provided with wall-switched ceiling mounted light fixtures. A minimum of one lighting fixture, ceiling or wall mounted, as appropriate, shall be provided in the garage. Where exterior bulk storage is located within the enclosed walls of a garage, each space shall be lighted separately. A switch (switches) located at each door opening into the garage shall control garage lights.

a) Dining room ceiling light fixtures shall be fixed suited for typical dining room furniture arrangement.

b) The general lighting intensity in kitchens shall be 30 to 50 foot-candles (320 to 540 Lx). Supplementary lighting shall be provided above the sink and underneath one of the wall cabinets for a work center to produce a composite lighting level of 75 foot-candles (210 Lx).

By using either down-lights, fluorescent fixtures surface-mounted below wall cabinets, or wall-mounted fixtures. Kitchen range hood shall be provided with a light, fan, and switches.

Ceiling fans/light fixtures including wall switches for all bedrooms are considered betterment's to the family housing units.

14.9 DETECTORS

14.9.1 SMOKE DETECTORS

In accordance with the latest issue of Underwriters Laboratories UL-268, detectors shall be residential application, ionization type, powered by 60 Hz, separate dedicated unswitched 120VAC source, and shall be built-in type with pigtail power connection. Smoke detectors shall include LED indicator lamp, test switch, and shall reset automatically when smoke clears. Horn shall be rated at 85 decibels at 10 ft. Smoke detector bases shall be flush with quick male-female plastic snap on connectors for ease of mounting and dismounting the smoke detector. Smoke detectors shall also include battery back-up power. A low battery condition shall be annunciated by intermittent beeps, until user replaces it. Provide a minimum of one additional detector per floor of the housing unit, but not in crawl spaces and unfinished attics. Provide an audible/visible alarm device in addition to the required hard-wired smoke detectors where there is a vision or hearing-impaired occupant.

a) Provide hard-wired smoke detectors on a separate circuit inside and near the door of each bedroom, and in the hallway near the convergence with the family or living rooms in each housing unit in accordance with NFPA 72, NFPA 101 and the International Building Code. In 2-story units, provide smoke detectors on the second floor in similar locations as the first floor. Alarm signal from one detector shall be wired to sound all detectors in that family housing unit.

14.9.2 CARBON MONOXIDE (CO) DETECTOR/ALARM

In accordance with the latest issue of UL-2034, detectors shall be residential application, multiple station powered by a dedicated 60 Hz, 120VAC source (separate from the 120VAC source for the smoke detectors), capable of being interconnected with up to 11 identical detectors. Carbon monoxide detectors shall be 100% solid state, have a biomimetic sensor and meet sensitivity requirements of UL-2034. Detectors shall incorporate an 85dB electronic horn at 10 feet that will sound an early warning or full alarm depending on the level of CO. Detector shall include LED indicator lamp, test switch, and shall reset automatically when level of CO clears. CO detector bases shall be flush with quick male-female plastic snap on connectors for ease of mounting and dismounting the carbon monoxide detector. Carbon monoxide detectors shall also include battery back-up power. A low battery condition shall be annunciated by intermittent beeps, until user replaces it. Provide CO detectors minimum one each level of housing unit and in the vicinity of the bedrooms (e.g., in the hall outside of each bedroom and as recommended by CO detector manufacturer). Alarm signal from one CO detector shall be wired to sound all CO detectors in that family-housing unit.

14.9.3 RADON DETECTORS

Provide a radon detector with an indicator light in the utility room near the radon vent pipe. The radon failure alert light shall be placed in the utility room and shall go on when it detects that the radon fan in the attic is not operating properly. The radon detector shall be on a separate dedicated 120VAC circuit with battery back-up power. A low battery condition shall be annunciated by intermittent beeps, until user replaces it. See **PART 11 – UNIT DESIGN - PLUMBING** for additional requirements.

14.10 TELEPHONE

Flush mounted telephone jacks with 4-pair CAT5E, 24 AWG telephone cables shall be provided in kitchens, all bedrooms, family, and living rooms. Provide for each housing unit with a minimum number of flush mounted telephone outlets as follows: kitchen [1 wall-mounted phone], family room [2 phone and data], living room [2 phone and data], master bedroom [2 phone], and all other bedrooms [1 phone], of each housing unit. Provide each family housing unit with two-phone line capability extending to each individual telephone outlet jack. Ensure telephone jacks in the family room, living room, and master bedroom are not next to each other, but located in areas that will accommodate various furniture arrangements.

All telephone system wiring shall be concealed, home run style from telephone distribution box to each individual telephone jack location. Wiring shall comply with TIA/EIA Standard 570A, Residential Telecommunications Cabling Standard. Cable and jacks shall be Category 5E per TIA/EIA 568B, Commercial Building Telecommunications Cabling Standard. The Contractor shall provide and install the telephone system inside the housing unit. The Contractor shall arrange a coordination meeting with the Qwest Telecommunications Phone Company prior to the 100% design phase, after award of the contract to insure the design is accurate.

14.11 CABLE TELEVISION

The Contractor shall provide the interior cable TV system per the local Midcontinent Cable TV Company. Provide 75-ohm coaxial cable for all wiring. Loop wiring shall not be allowed. Pre-wired cable television flush mounted antenna outlets shall be provided in each family housing unit. Provide one cable outlet in the kitchen for an above counter and below kitchen wall-cabinet television location. Provide, as a minimum, two flush mounted cable outlets in the living room, family room, master bedroom, and one cable outlet in each of the other bedrooms. Ensure that the cable outlets located in the family room, living room, and master bedroom are not next to each other, but located in areas that will accommodate various furniture arrangements. Provide a receptacle outlet near each cable outlet.

All cable television system wiring shall be concealed, home run style from cable television system distribution box to each individual television jack location. Each cable shall be provided with an appropriate tag, inside the terminal box, showing housing unit number and outlet location (i.e., Unit number 2, family room outlet). The Contractor shall provide and install the cable TV wiring inside the housing unit. The Contractor shall arrange a coordination meeting with Midcontinent Cable TV Company prior to the 100% design phase after award of the contract to insure the design is accurate.

14.12 ENTRANCES/GARAGE

The front and rear entrance to each housing unit shall be provided with a low voltage push button as a means for visitors to signal their arrival. The low voltage bell or buzzer located inside the family housing unit should be located in an area where it can be easily heard throughout the housing unit.

Provide a minimum of one weatherproof Ground Fault Circuit Interrupting (GFCI) duplex convenience outlet in garages, patios, and near the front and rear entrance and other areas as required in paragraph 14.5. Provide a power outlet and a garage door control wire, pre-wire for a garage door opener.

Provide adequate lighting so that no areas of the entry are left dark. For attached garages, provide a light switch in the garage.

14.13 CRAWL SPACES

Provide a single light fixture near the access panel entry. The fixture shall be operated by a light switch located on the wall of the room that the crawl space access panel is located in. The crawl space shall contain a duplex receptacle outlet which is to be located near the light fixture.

14.14 ELECTRICAL EQUIPMENT REQUIREMENTS

Contractor shall identify the dedicated circuits for the microwave as well as any other dedicated circuits. Provide separate, dedicated branch circuits in each living unit for the following:

Air conditioners
Dishwashers
Microwaves
Furnace
Water heater
Clothes washer (120 volt) and dryer (240 volt)
Kitchen stove (120 volts for gas)
Refrigerator
Garbage disposal (1/2 HP minimum with switch)

14.15 LIGHT FIXTURE TYPES

Bedroom
Arroyo/Craftsman P1H-15 series
Quoizel TF1263Z

Hall
Arroyo/Craftsman PS-12 series
Quoizel TF 8114
Maxim 4059 HOBU

Dining
Arroyo/Craftsman PSH-18
Quoizel TF 1245
Troy FSI7510
FIW7511

Kitchen
Thomas FD 440-53 GDES

Bathroom
Arroyo/Craftsman A-Line AS-3WO-P
Quoizel AI 893P
Troy B8013PC

Exterior Light Fixtures
Seagull 8408-71

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SECTION 01040

AS-BUILT DRAWINGS

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SECTION 01040

AS-BUILT DRAWINGS
5/00 (Rev Oct 2001)

PART 1 GENERAL

1.1 DEFINITIONS

The definitions listed below form a part of this specification.

1.1.1 Construction Drawings

Final design drawings accepted by the Government for construction of the facility.

1.1.2 Red-Line Drawings

Construction 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.

1.1.3 As-Built Drawings

Professional finished mylar drawings and electronic CADD files developed from the Construction drawings that include all of the information from the redline drawings and suitable for half-size reproduction.

1.1.4 Vellum Drawings

Drawings on erasable Vellum 20# similar or equal to Xerox Zero solvent vellum.

1.1.5 Black-Line Drawings

Paper drawings reproduced from electronic CADD Files or high quality reproducible drawings.

1.1.6 Full-Size Drawings

28 inches x 40 inches nominal size drawings with all details visually readable.

1.1.7 Half-Size Drawings

14 inches x 20 inches nominal size drawings with all details visually readable.

1.1.8 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.

1.1.9 Mylar Drawings

Drawings on polyester film, 3 or 5 mil, similar or equal to K & E Stabilene.

1.1.10 Electronic CADD Files

Electronic CADD files are files saved on CD-ROM in accordance with appropriate CADD standard. The CADD standard will include level on/off status, special characters, line wieghts, font, and size requirements.

1.2 GENERAL REQUIREMENTS

The work includes creation of mylar and electronic cadd files on AutoCADD 2000 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's CADD standards are located on the Omaha District's FTP site (ftp://ftp.nwo.usace.army.mil/pub/ED/CADD/ae/standards/ACADstd.pdf) for AutoCADD. The As-Built drawings shall include all major features of the work and all details to the same level as the construction set of drawings. All changes from the construction drawings, including but not limited to all deviations, additional information, and modifications to the contract. Where construction 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 construction set of 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 progress chart or network analysis system (NAS), whichever is applicable.

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 AutoCADD (Version 2000) with "clouding". As-Built preparation process is provided in paragraph As-Built Preparation. Preliminary drawings shall consist of 15% of total project drawings. 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" will be accomplished on layer 63 of the drawing file. The Preliminary Drawings shall consist of one (1) set of CADD files on a CD and one (1) full-size set of the Black-Line Drawings. One (1) set of CADD files

on a CD shall be submitted to the Omaha District Office (ATTN: CENWO-ED-DI, Jim Janicek). One (1) full-size of the Black-Line Drawings shall be submitted to the COR. Both documents shall be submitted three (3)weeks prior to the final acceptance inspection unless otherwise directed by the COR. The COR will notify the Contractor in writing of approval / disapproval. The Contractor shall not submit the Final Drawings until he receives the COR's letter approving the Preliminary Drawings.

1.4.2 Final As-Built Drawings

The Contractor shall produce Final As-Built Drawings on AutoCADD (Version 2000) without "clouding". As-Built preparation process is provided in paragraph As-Built Preparation. The Final Drawings shall include all changes. The Final Drawings 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 should not be forwarded to the customer. Corps of Engineers, Omaha District COR will forward to the customer after Quality Review.) One (1) set of CADD files on a CD shall be submitted to the Omaha District Office (ATTN: CENWO-ED-DI, Jim Janicek). Send the following documents to the COR: One (1) set of CADD files on CD (folder name containing as-built files shall be designated "AS-BUILTS" on each CD-ROM). Both CD case and CD 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. In addition one full-size set of vellum As-Built Drawings, along with all red-lined hard copy drawings prepared by the Contractor during construction shall be submitted to the Contracting Officer.

1.4.3 As-Built Preparation

Both preliminary and final electronic as-built drawings shall be produced in accordance with the following process for AutoCAD drawings:

1.4.3.1 For AutoCAD (*DWG) Files

1. When opened, we shall see the drawing exactly as it should be plotted.
2. The view shall be zoomed to fit the border.
3. All information in the title block shall filled in, including plot scale.
4. The information in the title block shall be correct, including the design file name and the plot scale.
5. All files shall reference an AutoCAD border supplied by the Omaha District.
6. All unnecessary information outside the border shall be deleted.
7. All files shall be purged.
8. All xrefs shall be included in directory.
9. All fonts used shall be included with the set, even if it is the standard AutoCAD fonts. Fonts are provided in paragraph Standard AutoCAD fonts.
10. An ASCII text file shall be provided with the following information: a brief history of how the files were created, if they were converted from MicroStation, 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 AutoCAD used to create and/or work on the drawings.
11. Both the .ctb file and the .pc3 file shall be supplied.

12. Each sheet/design shall have its own file and file name.

1.4.3.2 Standard AutoCAD fonts

```
ARCHSTYL.SHX      bgothl.ttf      cibt____.pfb
AU101S01.SHX        bgothm.ttf      cibt____.pfm
AU102S01.SHX        compi.ttf      cobt____.pfb
bigfont.shx         comsc.ttf      cobt____.pfm
bold.shx            dutch.ttf         copying.gs
complex.shx         dutchb.ttf      euro____.pfb
dim.shx            dutchbi.ttf      euro____.pfm
gothice.shx         dutcheb.ttf      eur_____.pfb
gothicg.shx         dutchi.ttf      eur_____.pfm
gothici.shx         monos.ttf      fontmap.bd
greekc.shx         monosb.ttf      fontmap.ps
greeks.shx         monosbi.ttf      outline
HELVETIC.SHX        monosi.ttf      par_____.pfb
isocp.shx         stylu.ttf        par_____.pfm
isocp2.shx         swiss.ttf        romb____.pfb
isocp3.shx         swissb.ttf      romb____.pfm
isoct.shx            swissbi.ttf      romi____.pfb
isoct2.shx         swissbo.ttf      romi____.pfm
isoct3.shx         swissc.ttf      rom_____.pfb
italic.shx         swisscb.ttf      rom_____.pfm
italicc.shx         swisscbi.ttf      sasbo___.pfb
italict.shx         swisscbo.ttf      sasbo___.pfm
monotxt.shx         swissci.ttf      sasb____.pfb
MROMANS.SHX      swissck.ttf      sasb____.pfm
msimplex.shx         swisscki.ttf      saso____.pfb
outline.shx         swisscl.ttf      saso____.pfm
romanc.shx         swisscli.ttf      sas_____.pfb
romand.shx         swisse.ttf      sas_____.pfm
romans.shx         swisseb.ttf      suf_____.pfb
romant.shx         swissek.ttf      suf_____.pfm
scriptc.shx         swissel.ttf      teb_____.pfb
scripts.shx         swissi.ttf        teb_____.pfm
simplex.shx         swissk.ttf      tel_____.pfb
special.shx         swisski.ttf      tel_____.pfm
syastro.shx         swissko.ttf      te______.pfb
symap.shx         swissl.ttf        te______.pfm
symath.shx         swissli.ttf      uglyr.gsf
symeteo.shx         umath.ttf
symusic.shx         vinet.ttf
txt.shx
```

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).

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.

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 construction drawings legend sheet, shall not be used. Additional symbols, properly identified, necessary to depict any additional work items, shall be 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 construction 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 construction 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 construction 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 construction 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 construction 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 on the construction drawings shall be revised to reflect as-built conditions, and setpoints.

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SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01200

WARRANTY OF CONSTRUCTION

5/00 (Rev 10/00)

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SECTION 01200

WARRANTY OF CONSTRUCTION
5/00 (Rev 10/00)

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.

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 Utility Systems, Roof Leaks, 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

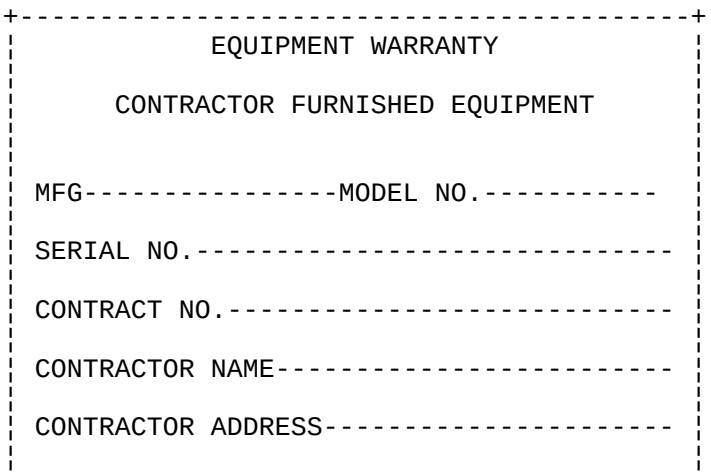
The Contractor shall provide warranty identification tags on all Contractor and government furnished equipment which is Contractor installed.

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:



CONTRACTOR TELEPHONE----------
CONTRACTOR WARRANTY EXPIRES----------
IN CASE OF WARRANTY ACTION FIRST CONTACT
[DEH] [BCE] AT [TELEPHONE NUMBER]

EQUIPMENT WARRANTY
GOVERNMENT FURNISHED EQUIPMENT
MFG _____ MODEL NO._____
SERIAL NO. _____
CONTRACT NO. _____
DATE EQUIP PLACED IN SERVICE _____

1.4.1.3 Exclusion to Providing Tags

If the manufacturer's name (MFG), model number and serial number are on the manufacturer's equipment data plate and this data plate is easily found and fully legible, this information need not be duplicated on the equipment warranty tag. The Contractor's warranty expiration date and the final manufacturer's warranty expiration date will be determined as specified by the Paragraph "WARRANTY OF CONSTRUCTION".

1.4.2 EXECUTION

The Contractor will complete the required information on each tag and install these tags on the equipment by the time of and as a condition of final acceptance of the equipment. The Contractor shall be responsible for scheduling acceptance inspection with the Contracting Officer (verbal and written notification required). If this inspection is delayed by the Contractor, the Contractor shall, at his own expense, update the in-service and warranty expiration dates on these tags.

1.4.3 Equipment Warranty Tag Replacement

Under the terms of this contract, the Contractor's warranty with respect to work repaired or replaced shall run for one year from the date of repair or replacement. Such activity shall include a data warranty identification tag on the repaired or replaced equipment. The tag shall be furnished and installed by the Contractor, and shall be similar to the original tag, except that it should include the scope of repair and that the contractor's warranty expiration date will be one year from the date of acceptance of the repair or replacement. In the case of repair, the repair only will be covered by the extended warranty. In the case of replacement of a component, the component only will be covered by the extended warranty. In these cases, the original tags will not be removed, but an additional tag

will be installed for the repair or component replacement.

PART 2 NOT USED

PART 3 NOT USED

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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01320A

PROJECT SCHEDULE

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

SUBMITTAL PROCEDURES
09/01; Omaha Update 11/02

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-RE")

"G-RE" submittals subject to Government review are those so designated by the Contracting Officer during the design process or preconstruction meeting. All "G-RE" 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-RE" 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 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-RE" and FIO Submittals

Except as noted below, data for all items listed as "G-RE" 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-RE" 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-RE" 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.

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-RE" Submittals

Two (2) copies of "G-RE" 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-RE - Approved by Contracor's Quality Control Representative and Designer and conformance review by the Government.

For Information Only - All other submittals without a G-RE 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-ED,] G-RE 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 --

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES OR MANUFACTURE'S CERTIFICATES OF COMPLIANCE	DATE	TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS (This section to be initiated by the Contractor)

TO:	FROM:	CONTRACT NO.	CHECK ONE: ☐ THIS IS A NEW TRANSMITTAL ☐ THIS IS A RE-SUBMITTAL OF TRANSMITTAL NO. _____
SPECIFICATION SECTION NO.	PROJECT TITLE AND LOCATION		CHECK ONE: ☐ FIO ☐ G-RE ☐ G-AE

ITEM NO. *a.*	DESCRIPTION OF ITEM SUBMITTED *(Type, size, model, etc.)* *b.*	MFG. OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. *c.*	NO. of COPIES *d.*	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE *g.*	VARIATION *(SEE #6)* *h.*	FOR CE USE CODE *i.*
				SPEC. PARA. *e.*	DWG. SHEET *f.*			

REMARKS:

I certify that the above submittal items have been reviewed in detail and are correct and in strict compliance with the contract drawings and specifications except as otherwise stated.

_____

NAME, PHONE NUMBER, AND SIGNATURE OF CONTRACTOR QC

SECTION II - REVIEW / APPROVAL (For Variation Only) ACTION

ENCLOSURES RETURNED *(List by Item No.)*	NAME, TITLE, AND SIGNATURE OF REVIEWING 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 – Reviewed for compliance. No exceptions taken.

B – Reviewed for compliance. Exceptions as noted.

C - Reviewed for compliance. 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)

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

(Reverse of CENWO-CD-Q SUBMITTAL FORM, D/B-1 (Omaha Version of ENG Form 4025-R))

SECTION 01332

SUBMITTALS DURING DESIGN

INDEX

SECTION 01332

DESIGN SUBMITTAL REQUIREMENTS (TASK ORDER NO. 1)
9/01

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 the complete housing project design including preparation of drawings, specifications, design analyses and other design and construction deliverables conforming to the requirements contained in this section. Distribution requirements for design deliverables are also covered in this section.

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 AutoCADD Standards are located on the CD-ROM issued with solicitation (AutoCadd file is under a folder labeled “AUTOCADD”. AutoCADD Standards utilize the National CAD standards with Omaha District refinements concerning file names, layers, colors, line widths, details and symbols. See Section 01040 AS-BUILT DRAWINGS for a summary of Omaha District file format and font 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
AutoCADD 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

(2) AIR FORCE DESIGN CRITERIA

http://afpubs.hq.af.mil

(3) UNIFIED FACILITIES GUIDE SPECIFICAITONS (UFGS)

The Contractor shall provide project specification in accordance with Paragraph 3.2, herein. This includes Government Provided Specifications as referenced in Paragraph 3.2.2. If the Contractor chooses to utilize UFGS (Specintact) specifications to develop project specifications, the Government has them 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 ENGLISH UNIT REQUIREMENTS

This project shall be developed and accomplished using "English Unit" measurement.

1.4 DEFINITIONS

1.4.1 CONTRACTOR

Firm or company to whom award was made to design and construct the Replace Family Housing, Task order No.1, located at Ellsworth AFB, South Dakota.

1.4.2 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.

1.4.3 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: SUBMITTAL PROCEDURES are not to be provided until after design drawings are determined satisfactory for construction.)

1.4.4 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.

1.4.5 REQUEST FOR PROPOSAL (RFP)

Documents furnished to prospective offerors containing proposal information and specifying criteria and project requirements for design and construction of the Replace Family Housing, Phase III, Task Order No.1, located at Ellsworth AFB, South Dakota. The documents include this specification, attachments, and the RFP drawings.

1.5 QUALITY ASSURANCE (SEE SECTIONS 00110 AND 01451)

1.6 SUBMISSION OF DESIGN DRAWINGS, SPECIFICATIONS AND DESIGN ANALYSES

1.6.1 DESIGN CERTIFICATION

Within each design submittal, the Contractor shall certify that all items submitted in the design documents comply with the requirements of the RFP. 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 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.

1.6.2 DEVIATIONS

Deviations from the RFP technical requirements shall be identified in the letter of transmittal. Deviations from the RFP technical requirements will be considered and accepted by the Contracting Officer if the change result in a significant improvement to the project or it exceeds the minimum RFP technical requirements.

1.6.3 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.

1.6.4 DRAWINGS

a) **Software Requirements:** All design drawings shall be done by the Contractor in AutoCAD 2000 .dwg file format. Format shall conform to Omaha District AutoCADD Standards. See Section 01040: AS-BUILT DRAWINGS for a listing.

b) **RFP Drawings:** RFP Drawings will be furnished in AutoCAD 2000.dwg file format with this solicitation and are considered useable for planning purposes, they will be furnished electronically in the Phase 2 portion of the solicitation to allow Offerors electronic files to layout their site and housing concept designs (See Section 00110 PROPOSAL SUBMISSION AND EVALUATION) for submission in AutoCAD 2000.dwg file format within 30 calendar days of contract award.

1.6.5 DESIGN DOCUMENTS

Design documents, as required by the Final design submittal stated hereafter, shall include construction drawings, specifications and design analysis/calculations 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.

1.6.6 DESIGN REVIEWS

Two design reviews will be held for this project. All review conferences will be held at Ellsworth AFB, South Dakota. The first design review will be for the 100 percent Site Design and 60% Housing Design. The second review will be a backcheck review of the 100% Corrected Site Design and the 100% Housing Design. The Government may call for a review conference of the 100% Corrected Housing Design if comments and designs issues are not solved through means of Dr Checks and correspondence. This may require a single discipline needed to attend or several design team members to attend. Once the Corrected Final Designs (100 percent Site and Housing) are reviewed and determined to be satisfactory for the purpose of beginning construction, the Contractor shall prepare and distribute full sets (site and housing combined) 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.

1.6.7 DOCUMENT PACKAGING

The design submittals include the Final 100% Site and 60% Housing, and 100% Housing (complete design for all design disciplines, based on the RFP drawings and specifications for stages of design required and listed herein. These documents shall be packaged and stamped "For Review Only – 100% Final Site Design and 60% Housing Design" and "For Review Only – 100% Final Housing Design", each sheet of the drawings shall also be stamped. The Corrected Final (100 percent) backcheck design submittal (Site and Housing), after the Government review of the Final (100 percent) 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 "For Construction" documents. Once, the 100% corrected design submittal has been approved and corrected, the Contractor shall prepare and submit the "For Construction" set of design documents. These documents shall be packaged and stamped "For Construction", and each sheet of drawings shall also be stamped. Once the "For Construction" design is deemed compliant by the Government, any changes to the plans and specifications shall be submitted as a deviation in accordance with Section 01330 Submittal Procedures. No additional time for completion of the contract will be granted to the Contractor due to insufficient design submittals. See paragraph 3.6.6 "Government Design Review and Acceptance" for additional requirements.

2 PRODUCTS

2.1 MATERIAL REQUIRED FOR 100% FINAL SITE AND 60% HOUSING DESIGN AND 100% FINAL HOUSING DESIGN SUBMITTAL:

All drawings included in the required technical data for the proposal submission shall be developed to design stages required below for completion. In addition to the individual utility plans, submit a combined utility plan drawn to the same scale as the individual utility plans. Furnish mechanical and electrical plans, with complete schematics, to show all air conditioning, plumbing and electrical work. A licensed professional engineer or architect shall perform all design and calculations. A licensed professional engineer or architect shall stamp all drawings. The following design documents shall be provided in the design submittals. Note: Various drawings for housing design are listed to submit at "100%Only". For those listed as such, no 60% Housing Design drawing is required.

2.1.1 SITE/INFRASTRUCTURE

a) Environmental Protection Plan: The Contractor shall prepare and submit, with the 100% Design review documents, an Environmental Protection Plan in accordance with the requirements of Section 01355 ENVIRONMENTAL PROTECTION, including the recycling of Freon refrigerant. As an Appendix to the Environmental Protection Plan, the Contractor shall include copies of all environmental reports, permits, approvals, applications, and associated documents as an Appendix to the Environmental Protection Plans.

b) 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, stockpile area, and the overall project site.

c) Removal Plan: The removal plan will show the existing physical features and condition of the site before construction. Each physical feature to be removed shall be hatched as indicated on the standard legend sheet, a legend on the removal plan, and properly noted: to be removed, to remain, or to be relocated. The Removal Plan shall be prepared at the same drawing scale and use the sheet boundaries as the Site Plan.

d) Site Plan: The Site Plan shall show all the site layout information necessary to field locate the houses, street work, driveways, sidewalks, patios, privacy fence, security fence, recreation areas, 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, driveways, walks, retaining walls, mechanical units, electrical transformers locations, etc. in accordance with a standard legend sheet or with additional legends or notes. Drawing scales of 1" = 30' or 1' = 40' 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.

e) Site Details: The Contractor shall provide details for all site furnishings, playground equipment, patio privacy fence, accessories, handicap accessible ramps, signage, and any other site structure or item requiring a detail for clarity and construction accuracy.

f) Landscape Plan: A detailed Landscape Plan showing trees, shrubs, ground cover, and seeded or 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 un-surfaces ground areas disturbed by construction within the project limits with these areas shown to be seeded or sodded as required.

g) **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.

h) **Pavement Plan:** The pavement plan will show the existing streets and condition of the pavement prior to construction. The survey plan shall be used to create the pavement plan. This drawing shall be used to indicate the location of any pavement work required.

i) **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 ft contour intervals. Indicate the finished floor elevation of new houses and structures. Plans shall show the layout of the new and existing storm drainage and roof drainage systems. Provide spot elevations at building 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. Provide location and description of benchmarks and indicate vertical and horizontal datum's.

j) **Storm Drain and Culvert Profiles:** Provide profiles of any new storm drains and culverts 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 and culvert pipes shall be provided.

k) **Foundation Drainage System:** Provide plan, typical cross section, and details of the foundation drainage system.

j) **Drainage Structure Details:** Provide typical details of all storm drainage structures. Unless otherwise directed, use Omaha District standard detail drawings. The use of alternate details shall be approved prior to submitting the final design documents. A, B, C, and D dimensions of all storm drain and subdrain structures shall be shown. Dimensions may be shown on either the storm drain schedule, the storm drain profiles, or on the storm drain structure detail drawings.

k) **Storm Water Pollution Prevention Plan (SWPPP) Site Map:** Provide a site map indicating 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 erosion 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.

l) **Erosion Control Details:** Provide details of best management practices used to control erosion.

m) **Typical Pavement Sections and Details:** Provide typical driveway, sidewalk, patio, pavement overlay, curb and gutter, curb ramps, and road repair sections and details.

n) **Typical Driveway Pavement Joint Layout Plans:** Provide typical pavement joint layout plans for each type of housing unit provided. Each type of joint shall be shown with a different symbol and a joint legend provided. Under no circumstances shall pavement joint layout plans be combined with any other plans.

o) **Typical Patio Joint Layout Plans:** Provide typical joint layout plans for the patio area for each type of housing unit provided. Each type of joint shall be shown with a different symbol and a joint legend provided. Under no circumstances shall pavement joint layout plans be combined with any other plans.

p) **Sanitary Sewer and Water Plans:** Sanitary sewer and water plans shall show locations of new and existing mains and service lines, elevation of sewer pipe, valves, connections. Thrust blocks, manholes, etc. Scale to match site plans.

q) Natural Gas Plans: Scale to match site plans foe natural gas plans. Natural gas distribution system plans shall include, but not limited to, the following:

--Locations of existing mains and service lines, including those to be removed.
--Locations of new gas service mains and service lines, including points of connection to existing piping.
--Trench installation Details for both the main lines and the service lines.
--Valve Box Details.
--Gas Service Regulator Assembly Detail.
--Cathodic Protection Details.

q) Electrical Distribution Plans (Scale to match site plan): Electrical distribution plan shall show site lighting (street and walkway), primary cable routing (new and existing) pad-mounted transformers & switches, and secondary service laterals. Scale to match site plans.

Show the following:

-- Site lighting (street and walkway)
-- Primary cable routing (new and existing)
-- Pad-mounted transformers & switches
-- Secondary service laterals
--On-Site One Line Diagram

r) On-Site Distribution Transformer Schedule (with the following headings:)

--Transformer Designation
--Transformer Size (KVA)
--Building(s) Served
--Primary Phase(s) and Circuit to which connected.

s) On-Site Details (Site Lighting, Trenching, etc.)

2.1.1.1 Required Site Infrastructure Specifications (100% Complete):

Required technical specifications Omaha District Guides for site and infrastructure shall be complete and fully edited to reflect and coordinate 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.

For Asbestos Abatement Specification: Procedures for demolition of structures with Category I nonfriable asbestos-containing materials in place are described in Section 01400 SPECIAL SAFETY REQUIREMENTS FOR DEMOLITION. The Contractor shall comply with applicable Federal and state regulations, especially South Dakota Emission Standard for Hazardous Air Pollutants 33-15-13-02.

For Lead-Based Paint: Any lead-based painted architectural components proposed for removal prior to demolition shall be identified in writing and the removal procedures and associated health and safety protocols shall be provided. Where lead-based painted surfaces will remain in the units for demolition, follow the protocols described in Section 01400 SPECIAL SAFETY REQUIREMENTS FOR DEMOLITION.

Note: Much of the site work requires the specific use of Government Provided Guide Specifications as indicated in Attachment No. 3 and Paragraph 3.2.2. GOVERNMENT PROVIDED GUIDE SPECIFICATIONS, herein. In other areas of site work, which do not require the specific use of a Government Provided Guide Specifications, the Contractor shall produce final specifications as required by Paragraph 3.2 SPECIFICATIONS.

2.1.2 HOUSING UNITS

Submit for each typical housing type.

a) Floor Plans: (Scale 1/4" = 1'-0")

For each housing type, show the following:

-- Overall dimensions
-- Room description with dimensions and areas
-- Furniture layouts
-- Vanities
-- Appliances (including occupant-owned washer, dryer, and micro-wave Oven; and contractor-furnished refrigerator, stove, and Dishwasher)
-- Plumbing fixtures locations
-- Kitchen layout
-- Door swings
-- Garage locations
-- Patio, Walks, Privacy and Good Neighbor fencing
-- Exterior/Interior bulk storage
-- Service (trash) area
-- Furnace, AC units, and hot water heater locations
-- Calculated gross and net floor areas
-- Electrical switches, outlets, telephone jacks, CATV jacks
-- Electric light fixture locations and schedule
-- Equipment Layout
-- Smoke/carbon monoxide detectors

b) Exterior Elevations: (Scale 1/4" or 1/8" = 1'- 0")

For each housing type, show all sides of a building complete with notes indicating the exterior finish materials shall be shown.

c) Interior Elevations: (Scale 1/4" = 1'- 0")

Show the following:

-- Kitchen
-- Bathrooms

d) Building Cross Sections for Each Type of Building: (Scale 1/4" = 1'-0")

For each housing type, show the following:

--Structural system
--Building materials
--Finishes
--Vertical dimensions

e) Typical Wall Section: (Scale 3/4" = 1'- 0")

For each housing type, show the following:

--Typical wall
--Foundation

--Floor and roof section
--Materials
--Cavity wall
--Party wall w/STC rating
--Fire rated construction with UL or Gypsum Association File No.
--Thermal Insulation

f) **Finish Schedule: Show** finish schedule of all rooms.

g) **Fire and Sound Rated Assemblies:** Show the construction of fire and sound rated assemblies in detail and note on the drawings the tested design upon which the construction is based. Note any modification to materials or method of construction. Detail all penetrations of rated partitions.

h) **Detail References:** All details shall be referenced to floor plans, elevations or sections.

i) **Kitchen Cabinet Elevations:** Kitchen cabinet elevations shall note cabinet sizes.

j) **Foundation and Floor Slab Plans: (Scale: 1/4" = 1'-0")**

For Each Housing Type show:
--Dimensions and materials of foundation system (If not shown on any other typical drawing)

k) **Structural Floor and Roof Framing Plans: (Scale: 1/4" = 1'-0")**

For Each Housing Type show:
--Structural framing members and spacing dimensions
--Details of any main structural framing members or connections such as beams, headers, etc.

l) **Architectural Rendering:** Contractor shall provide ground level perspective artist's renderings of typical family housing units completed with walks, parking, and landscaping. Renderings shall be no smaller than 14 inches by 18 inches or larger than 28 inches by 36 inches, multi-colored, and shall be suitably titled, matted, and framed.

m) **Color Boards:** Color Boards shall be submitted showing color and pattern of materials prepared for interior and exterior finish materials, including floor, wall and ceiling finishes, roofing, siding, and trim shall be submitted to Contracting Officer on 8-1/2 inches by 11 inches sample boards/binder format.

n) **Consumer Information for Handicapped Requirements:** The Contractor shall furnish a report including drawings in accordance with the Uniform Federal Accessibility Standards, paragraph 4.34.4 "Consumer Information" for the modified and adaptable features of each applicable unit type of family housing.

2.1.3 SPECIFIC MECHANICAL AND PLUMBING REQUIREMENTS

Required Plans, Diagrams, Schedules and Details on Unit Mechanical Drawings (100% Only Design Stages):

a) **Mechanical Floor Plan: (Scale 1/4" = 1'-0")**

The floor plans shall show all principle architectural features of the building which will affect the mechanical design. The floor plan shall also show the following:

--Room designations
--Mechanical legend and applicable notes
--Location of all ductwork or piping (double line ductwork required **100% only**)
--Location and capacity of all terminal units (i.e., registers, diffusers, grilles, hydronic baseboards)
--Exhaust fan and range hood location
--Size of all ductwork and piping shown **100% only**

--Thermostat location
--Location of heating equipment (i.e., furnace(s))
--Location of air conditioning equipment (Condensing Unit Refrigerant Piping and Sizing. **100% only**)
--Return air paths (i.e., undercut doors)
- Transfer grilles
--Flue piping – location**; sizing 100% only**
--Piping diagrams for forced hot water system (if used) **100% only**
--Fuel supply and return piping
--Location of all Mechanical Equipment, including Furnace, Condensing Unit, Exhaust Fans, Range Hood, etc.
--Locations of all Balancing Dampers and Access Panels **100% only**.
--Location of Combustion Air and Furnace Flues**; sizing 100% only**.
--Natural Gas Service Entrance and location of Gas Piping**; sizing 100% only**.
--Dryer Exhaust Ducting.

b) Equipment Schedule Sheet:

Complete equipment schedules shall be provided. Schedule shall also include:

--Capacity
--Electrical characteristics
--Efficiency (if applicable)
--Manufacturer's name
--Any optional features to be provided
--Physical size
--Water Heater Schedule.
--Furnace/AC Coil Schedule.
--Condensing Unit Schedule.
--Exhaust Fan Schedule.
--Range Hood Schedule.
--Register and Grille Schedule.
--Exhaust Fan Schedule.

c) Details:

Construction details, sections, elevations, etc. shall be provided where required for clarification of methods and materials of design. All roof and exterior wall penetrations shall be detailed on the drawings. As a minimum, the following Details and Schedules shall be provided:

--Furnace Connection Detail, including Gas Piping, Flexible Connectors, and Filter Access **100% only**.
--Side-Views of Mechanical Equipment Room to ensure proper space exists for installation of Furnace and Water Heater with associated Ductwork, Piping, and Flues **100% only**.
--Condensing Unit Mounting Detail **100% only**.
--Exhaust Fan Details**100% only**.
--Roof and Exterior Wall Penetrations shall be detailed **100% only**.
--Below Slab Radon Piping Installation Detail.
--Radon Piping Manifold Detail.
-Water Service Entrance Detail.
--Water Heater Detail.
--Furnace AC Coil Condensate Drain Detail.
--Radon Sump Pump Details.
--Dishwasher Hook-Up Detail, including Connection to Disposal and Sink **100% only**.
--Sump Pump Detail.

d) Plumbing Floor Plan: (Scale: 1/4" = 1'-0")

The floor plan shall show all principal architectural features of the building that will affect the plumbing design. The floor plan shall also show the following:

--Room designations
--Plumbing Legend and applicable Notes.
--Fixture Schedule and Fixture designations
--Location of utility entrances
--Waste, vent, and hot and cold water pipe locations **(sizes 100% only)**
--Location of hot water heater
--Plumbing riser diagram **100% only**
--Below Slab Radon Piping.
--Above Floor Radon Piping.
-- Radon Exhaust Fan Location.
--Radon Vent locations through Roof and visual light location.
--Location of Water Service Entrance.
--Water Heater, Furnace, and Floor Drain Locations.
--Water Heater Flue Piping, including Venting through Roof.
--Foundation Drain Sump Pump.
--Plumbing Vents through Roof locations.
--Waste Piping Cleanout Locations.
--Wall Hydrant Locations.
--Water Hammer Arrestor Locations **100% only**.
--Access Panels and locations **100% only**.

e) Plumbing Plans: Separate-plumbing plans will not be required if sufficient information can be shown on the mechanical plans to meet the requirements shown above.

2.1.4 SPECIFIC ELECTRICAL REQUIREMENTS

a) Electrical Floor Plan: (Scale 1/4" = 1'-0")

The floor plans shall show all principle architectural features of the building which will affect the electrical design. The floor plan shall also show the following:

--Room designations
--Electrical legend and applicable notes
--All lighting fixtures, properly identified
--Location of all smoke detectors
--Location of telephone outlets
--Location of television outlets
--All switches for control of lighting
--All receptacles
--The location and designation of all panelboards. Plans should clearly indicate type of mounting required (flush or surface) and be reflected accordingly in specifications.
--Service entrance (conduit and main disconnect)
--Location, designation and rating of all motors and/or equipment which requires electrical service.
-- Show method of termination and/or connection to motors and/or equipment.
--Show all necessary junction boxes and disconnects
--Controllers (approximate only), conduit stubs and receptacles required to serve the motor and/or
-- equipment. (**100% only)**

b) Building Riser Diagram (from pad-mounted transformer to unit load center panelboard): Indicate the types and sizes of all electrical equipment and wiring. Include grounding and metering requirements.

c) Unit Load Center Panelboard Schedule(s):

Schedule shall indicate the following information:

--Panelboard Characteristics (Panel Designation, Voltage, Phase, Wires, Main Breaker Rating and Mounting
--Branch Circuit Designations.
--Load Designations
--Circuit Breaker Characteristics (Number of Poles, Trip Rating, AIC Rating)
--Branch Circuit Connected Loads (AMPS).
--Any Special Features

d) Lighting Fixture Schedule:

(Schedule shall indicate the following information:)

--Fixture Designation
--General Fixture Description
--Number and Type of Lamp(s)
--Type of Mounting
--Any Special Features

e) **Details**: Construction details, sections, elevations, etc. shall be provided where required for clarification of methods and materials of design.

2.2 DESIGN ANALYSIS & DESIGN CALCULATIONS

Design analysis and design calculations shall include complete site and housing unit descriptions and design calculations for storm drainage improvements, utility distribution systems, structural elements, electrical and mechanical systems, and roadway pavement and shoulder design.

2.2.1 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.

2.2.2 FOUNDATION DRAINAGE SYSTEM CALCULATIONS

Foundation Drainage System Calculations shall include selection of pipe sizes and sump pump calculations.

2.2.3 STRUCTURAL DESIGN CALCULATIONS

Design calculations are required for all structural elements not covered prescriptively by the International Residential Code (IRC). Calculations shall be stamped by a registered structural engineer.

2.2.4 MECHANICAL DESIGN ANALYSIS

a) **Water Supply Calculations:** Submit calculations at Final (100 percent) design stages to determine correct main water supply to each unit and/or building.

b) **Mechanical Calculations: Complete** mechanical design calculations shall be provided for all equipment such as furnaces, cooling coils, condensing units, piping, exhaust fans, air duct design, louvers, gas services and piping, plumbing, water heaters, 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.). Also, see paragraph 3.4 "Design Analysis".

2.2.5 ELECTRICAL DESIGN ANALYSIS

All design and calculations for the electrical systems shall be performed by a licensed professional engineer with experience in family housing, and shall be stamped as such. The design shall be a separate bound assembly, in one or more volumes, of all the functional and engineering criteria, design information, and calculations applicable to the project design. The analysis shall be organized in a format appropriate for review, approval, and record purposes. The design calculations shall be presented in a clear and legible form, with all methods and references identified, and all assumptions and conclusions explained.

a) Load Calculations

(1) A separate demand load calculation shall be provided for each type of individual living unit (per NEC Art. 220). Include catalog cuts of the electrical data for the HVAC equipment that was selected by the mechanical designer.

(2) A separate demand load calculation shall be provided for each type of multifamily dwelling. (Per NEC Art. 220)

(3) Calculate the demand load for each pad-mounted distribution transformer by adding all the demand loads (minus the HVAC load), for each type of living unit connected to the transformer, and then multiply by the appropriate demand factor found in the following table. Then, the HVAC load and any site lighting loads are added to this figure to arrive at the transformer demand load. (Note that the demand factors in the table shall not be applied to the HVAC loads and the Site Lighting loads, which are included at 100% demand.

DEMAND FACTOR TABLE

Number of Quarters	Demand Factor Percent	Number of Quarters	Demand Factor Percent	Number of Quarters	Demand Factor Percent
1	80.0	19	18.6	37	13.2
2	60.0	20	17.5	38	13.0
3	50.0	21	17.1	39	12.8
4	45.0	22	16.6	40	12.6
5	40.0	23	16.1	41	12.4
6	35.0	24	15.8	42	12.2
7	32.0	25	15.6	43	12.0
8	29.0	26	15.4	44	11.8
9	27.0	27	15.2	45	13.6
10	25.0	28	15.0	46	11.4
11	24.0	29	14.8	47	11.2
12	23.0	30	14.6	48	11.0
13	22.0	31	14.4	49	10.8
14	21.0	32	14.2	50	10.6
15	20.0	33	14.0	51	10.4
16	19.4	34	13.8	52	10.4
17	18.7	35	13.6	53	10.1
18	18.3	36	13.4	54	10.0

(4) Calculate the demand load for each phase of each circuit of the primary distribution system. The loads shall be computed using the same method as outlined for the pad-mounted transformers in the previous paragraph. (Note that for 54 or more living-units, the demand factor shall be 10%).

(5) In addition to the complete load calculations required hereinbefore, provide load summary tables which group and identify each type of demand load calculated. (Individual living-units, multifamily dwellings, pad-mounted distribution transformers, and primary phases.)

b) Voltage Drop (VD) Calculations

(1) Select conductor sizes of primary feeders and calculate maximum footage for each phase of each primary circuit, using a maximum allowable VD for each circuit.

(2) Select conductor sizes of site lighting circuits and calculate the VD for each circuit. (Maximum allowable VD = 3%).

(3) Select service lateral conductor sizes for each multifamily swelling and calculate the maximum length (in feet) of each different type of service lateral using a maximum allowable VD of 3%.

(4) Select unit feeder conductor sizes for each individual living unit and calculate the VD for the worst case branch circuit. The combined voltage drop for the service laterals, unit feeders, and branch circuit shall not exceed 5%.

(5) Short Circuit Calculations: Calculate the available fault current at the main breaker of the individual living-unit load center panel. A coordination study shall be provided for all fuse selections.

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.

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. 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:

Drawing Code: AF 711-15-01

3.1.2 DRAWINGS SEQUENCE

Arrange drawings by design discipline in accordance with Omaha District CADD Standards Manual.

3.2 SPECIFICATIONS

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 (Section 01000, Parts 1-14). For these specification sections, write at the Medium scope 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. 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 given on the CD-ROM as an option for use by the Offeror) 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.

For required materials (catalog cuts) submitted under SECTION 00110 PROPOSAL SUBMISSION AND EVALUATION in the Phase 2 portion of the solicitation, if sufficient information is indicated, not withstanding some interior and site requirements, which require both specifications and catalog cuts, the Contractor can furnish the catalog cut information provided under 00110 for the final specification usage in the construction documents. If used, the catalog cuts must demonstrate the “General Usage”, “Product” and “Execution” (Manufacturer’s Installation) instructions. All Specification information shall be arranged by CSI Division 16 format and numbered with TOC. Catalog Cuts shall display an intro sheet with a spec number for easy reference and indexing as combined with fully written specifications for a complete, concise set of construction specifications.

3.2.1 DIVISION 1 SPECIFICATION SECTIONS

Include Division 1 specifications (already edited by the Government) sections 01040 AS-BUILT DRAWINGS, 01200 WARRANTY OF CONSTRUCTION, 01320A PROJECT SCHEDULE, 01330 SUBMITTAL PROCEDURES, 01355 ENVIRONMENT PROTECTION, 01400 SPECIAL SAFETY REQUIREMENTS FOR DEMOLITION AND RENOVATION, and 01451A CONTRACTOR QUALITY CONTROL. These sections are contained in the RFP as part of the project specifications without change. Copies of these sections are included with the RFP on the advertised CD-ROM. Any other Division 1 Specifications required by the Contract shall be the responsibility of the Contractor. No other Division 1 Specifications will be required, unless specified otherwise in this solicitation or required by the Contractor.

3.2.2 GOVERNMENT PROVIDED GUIDE SPECIFICATIONS

Infrastructure work requires the use of Government Provided Guide Specifications (see list below). The contractor is required to fully edit these sections and present them at the 100% design stage. No catalog cut information from Section 00110 may be used in place of specifications listed below. They are mandatory for edit and construction. These Specifications and Software are included on the Advertised CD-ROM:

SECTION 01356 STORM WATER POLLUTION PREVENTION MEASURES
SECTION 02220A DEMOLITION
SECTION 02300A EARTHWORK
SECTION 02316A EXCAVATION, TRENCHING & BACKFILLING FOR UTILITIES
SECTION 02510A WATER DISTRIBUTION SYSTEM
SECTION 02531 SANITARY SEWERS
SECTION 02556A GAS DISTRIBUTION SYSTEM
SECTION 02561 (SOUTH DAKOTA) PAVEMENTS FOR SMALL PROJECTS
SECTION 02532A FORCEMAINS AND INVERTED SIPHONS, SEWER
SECTION 02620A SUBDRAINAGE SYSTEM
SECTION 02630A STORM DRAINAGE SYSTEM
SECTION 02821A FENCING

3.2.3 FORMAT FOR PROJECT SPECIFICATIONS

Submit the project specification, including a Cover page and Table of Contents, printed with a word processor using good quality white paper. The corrected final (100 percent) specifications with review comments incorporated shall be cleaned up (without marked-up edits) and submitted in both hard copy and on magnetic media (A Microsoft Windows compatible CD-ROM and compatible with the Microsoft Word 2000 format. The Cover page and attachments to specification sections shall be prepared in a Microsoft Word (compatible with Microsoft Word 2000) format. Carbon copies are not acceptable.

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.

3.3 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).

3.3.1 SUBMITTALS REGISTER (FORM)

Prepare and maintain a Submittals Register. The Submittal Register (ENG Form 4288 "Submittal Register" shall be prepared. 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 Contractor shall provide an electronic copy of the accepted submittal register, 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.

3.4 DESIGN ANALYSES

Prepare design analyses (basis of design and calculations) for each applicable design 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. Complete site and housing unit design calculations for utility distributions systems, structural elements and electrical and mechanical systems. Include computations for sizing equipment, air duct design, and U-factors for ceilings, roofs and exterior walls and floors. Also include final passive energy strategy performance calculations for each housing unit type. Contractor shall employ commercially available energy analysis techniques to determine the energy performance of all-passive systems and features. Use of hourly energy load computer simulation (e.g., TRNSYS, DOE 2.1 Blast, etc.) is required. Performance calculations shall also determine the peak-cooling load of all passive solar unit types. These calculations can be used to size the unit's mechanical systems.

c. Equipment Schedule. Based on the results of calculations, provide a complete list of the materials and equipment proposed for heating and plumbing, with the manufacturer's published cataloged product installation specifications and

roughing-in data. The heating equipment data shall include the manufacturer's wiring diagrams, installation specifications, ARI certification, and the standard warranty for the equipment. In addition, provide the manufacturer's published cataloged capacities for supply diffusers as evidence that the arrangement of supply air outlets in each room will provide the throw and spread characteristics required to cover completely all exterior wall surfaces with the blanket of warm air at the proper design velocities.

d. 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.

3.4.1 ENGINEERING CONSIDERATIONS AND INSTRUCTIONS (ECI) FOR FIELD PERSONNEL

3.4.1.1 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.

3.4.1.2 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."

3.4.1.3 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.

3.4.2 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.

3.5 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.

3.6 REVIEW BY GOVERNMENT AGENCIES

3.6.1 DISTRIBUTION OF DESIGN DOCUMENTS FOR CONFORMANCE REVIEW

(a) Government agencies shall receive review documents twenty (20) days prior to review conferences. Agencies reviewing documents, and in the quantities indicated, are listed below. All documents must contain an index of contents. Work shall be completed to the percentage required prior to conference. 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 twenty (20) 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.

3.6.1.1 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 3.6.1.3 through 3.6.1.6 for required copies for distribution.

SUBMITTAL ITEM - **ABBREVIATION**

Design Analysis Narrative - **DANar**
Design Analysis Calculations - **DACalcs**
Specifications - **Specs**
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**

3.6.1.2 Activity Distribution Addresses

U.S. Army Engineering District, Omaha
ATTN: CENWO-PM-M, Mr. John Stobbe
106 South 15th Street
Omaha, NE 68102-1618
Phone: (402) 221-3985

Construction Division
Attn: CENWO-CD-QC, Ms. Sarah Kellogg
U.S. Army Engineer District, Omaha
106 South 15th Street
Omaha, NE 68l02-1618
Phone: (402) 221-4160

U.S Army Corps of Engineers
Black Hills Area Office
ATTN: CENWO-CD-BH, Mr.Mark Mailander
631 St. Anne Street
Suite 101
Rapid City SD 57701
Phone: (601) 341-3169

U.S Army Corps of Engineers
Ellsworth AFB Resident Office
ATTN: CENWO-CD-BH-E, Mr. Dwight Pochant
2149 Scott Drive
Ellsworth AFB, SD 57706-4711
Phone: (605) 923-2983

HQ ACC
ATTN: HQ ACC/CECW, Mr. Conrad Browe
129 Andrews Street, Suite 102, Room 315
Langley AFB, VA 23665-2769
Phone: (757) 764-3680

28 CES/CECN
ATTN: Mr. Larry Herges
2149 Scott Drive
Ellsworth AFB, SD 57706-4711
Phone: (605) 385-2523

3.6.1.3 Final 100 % Site & 60% Housing Design Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item is listed below.

Activity Submittal item	CENWO-PM-M	CENWO-CD-QC	CENWO-CD-BH	HQ, ACC/CECW	28 CES/CECN	CENWO-CD-BH-M/ CENWO-CD-BH-G
DANar-	12	2	2	4	8	1/1
DACalcs-	6	2	2	4	8	1/1
Specs-	12	2	2	4	8	1/1
SubReg-	2	2	2	-	-	1/1
Dwg-1/2-	12	2	2	4	8	2/2
MMin-*(1)	12	2	2	4	8	1/1
EMDwg-*(2)	1	-	-	-	-	1/0
DCLet-	12	2	2	4	8	1/1
Colbd-*(3)	1	-	-	1	2	1/0
EP Plan	1	-	1	1	1	1/1
Rend-*(4)	1	-	-	1	1	1/0
ECI-	12	2	2	1	8	2/2

*100 PERCENT SITE SUBMITTAL NOTES:

*(1) To be submitted after Review Conference per requirements of this section.
*(2 Electronic Media Drawings:
Fifteen (15) percent of all drawings, representative of all design disciplines, shall be submitted in AutoCAD 2000 on CD-ROM to verify that the CADD standards being specified are complied with.
*(3) Color boards shall show actual color samples of all proposed exterior and interior finishes.
*(4) Pencil or Computer Sketch Rendering (3 views) of typical housing units.

3.6.1.4 Final 100 % Housing Design Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item is listed below.

Activity						
	CENWO-PM-M	CENWO-CD-QC	CENWO-CD-BH	HQ, ACC/CECW	28 CES/CECN	CENWO-CD-BH-M/ CENWO-CD-BH-G
Submittal item						
DANar-	12	2	2	4	8	1/1
DACalcs-	6	2	2	4	8	1/1
Specs-	12	2	2	4	8	1/1
SubReg-	2	2	2	-	-	1/1
Dwg-1/2-	12	2	2	4	8	2/2
MMin-*(1)	12	2	2	4	8	1/1
EMDwg-*(2)	1	-	-	-	-	1/0
DCLet-	12	2	2	4	8	1/1
Colbd-*(3)	1	-	-	1	2	1/0
EP Plan	1	-	1	1	1	1/1
Rend-*(4)	1	-	-	1	1	1/0
ECI-	12	2	2	1	8	2/2

*100 PERCENT HOUSING SUBMITTAL NOTES:

*(1) To be submitted after Review Conference per requirements of this section.
*(2 Electronic Media Drawings:
Fifteen (15) percent of all drawings, representative of all design disciplines, shall be submitted in AutoCAD 2000 on CD-ROM to verify that the CADD standards being specified are complied with.
*(3) Color boards shall show actual color samples of all proposed exterior and interior finishes (Resubmit only if changed form 60% design).
*(4) Pencil or Computer Sketch Rendering (3 views) of typical housing units. (Resubmit only if changed form 60% design).

3.6.1.5 Corrected Final (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						
	CENWO-PM-M	CENWO-CD-QC	CENWO-CD-BH	HQ, ACC/CECW	28 CES/CECN	CENWO-CD-BH-M/ CENWO-CD-BH-G
Submittal item						
DANar-	12	2	2	1	8	1/1
DACalcs-	6	2	2	1	8	1/1
Specs-	12	2	2	1	8	1/1
SubReg-	2	2	2	-	-	1/1
Dwg-1/2-	12	2	2	1	8	2/2
MMin	12	2	2	1	8	1/1
EMDwg-*(1)	1	-	-	-	-	-/-
DCLet-	12	2	2	1	8	1/1
Colbd-*(2)	1	-	-	1	2	1/0
EP Plan	1	-	1	1	1	1/1
Rend-*(3)	1	-	-	1	1	1/0
ECI-	12	2	2	1	8	2/2
DD1354-*(4)	1	1	1	1	1	0/1

*CORRECTED FINAL (100 PERCENT) DESIGN SUBMITTAL NOTES:

*(1) Electronic Media Drawings AutoCAD 2000 on CD-ROM shall be submitted to verify that the CADD standards being specified are complied with.
*(2) 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.
*(3) Color Copy of Rendering and electronic copy of scanned image of rendering on CD.
*(4) Draft submittal of DD Form 1354.

3.6.1.6 "For 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	CENWO-PM-M	CENWO-CD-QC	CENWO-CD-BH	HQ, ACC/CECW	28 CES/CECN	CENWO-CD-BH-M/ CENWO-CD-BH-G
DANar-	12	2	2	1	8	2/1
DACalcs-	6	2	2	1	8	2/1
Specs-	12	2	3	1	8	2/1
SubReg-	2	2	2	-	-	2/1
Dwg-1/2-	12	2	3	1	8	2/1
Dwg-Full	-	-	1	-	-	2/0
MMin-	12	2	2	1	8	2/1
EMDwg-*(1)	4	-	-	-	-	-/-
EMSpecs-*(1)	4	-	-	-	-	-/-
EMDA-*(1)	4	-	-	-	-	-/-
DCLet-	12	2	2	1	8	2/1
Colbd-*(2)	1	-	-	1	1	1/0
Rend-*(3)	1	-	-	1	3	1/0
ECI-*(4)	12	2	2	1	8	2/1

*"FOR CONSTRUCTION" SET SUBMITTAL NOTES:

Copies shall incorporate any additional comments made to the Corrected Final (100 percent) design submittal.

*(1) Electronic Media Drawings (AutoCAD 2000), Electronic Media Specifications (compatible with MS Word 2000), and Electronic Media Design Analysis (compatible with MS Word 2000) 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)
*(2) Reflects all changes made through accepted Corrected Final (100 Percent) Design. 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.

*(3) Framed and matted color Renderings and electronic copy of scanned image of rendering on CD (If different than previous rendering submittal)
*(4) In addition, the Contractor shall e-mail the designated offices a copy of the ECI per requirements stated in this section.

3.6.1.7 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 / Submittal Item	CENWO-PM-M	CENWO-CD-QC	CENWO-CD-BH	HQ, ACC/CECW	28 CES/CECN	CENWO-CD-BH-M/ CENWO-CD-BH-G
Asblt-DD1354-*(1)	* 1	* 1	* 1	* 1	* 1	*/* 1/1

*NOTES for As-Built Submittals:

*See Section 01040, AS-BUILT DRAWINGS for requirements.
*(1) Final submittal of DD Form 1354.

3.6.1.8 Design Submittal Alternative

The design-build Contractor may submit hard copy design analysis, design analysis calculations and appendices, specifications, submittal register, design certification letter, and engineering considerations and instructions on CD-ROM in an Adobe Acrobat 5.0 .pdf format and maximum of 2 hard copies 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.

3.6.2 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 14 days after receipt and review conference will be held approximately 20 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.

3.6.3 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: www.buildersnet.org/drchecks, 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 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, Mechanical, Electrical, and Civil/Site work.

3.6.4 DELAYS

Delays caused by the Contractor in completion of the Final (100 percent) design or the Corrected Final (100 percent) 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.

3.6.5 REPRODUCTION (FOR CONSTRUCTION):

Upon the Government's completion of the review of the Corrected Final (100 percent) 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 Final (100 percent) 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 and all cover sheets shall be stamped "For Construction". The Contractor shall provide corrected (100 percent) specifications in both hard copy and electronic media (compatible with MS Word 2000). 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.

3.6.6 GOVERNMENT DESIGN REVIEW AND ACCEPTANCE

3.6.6.1 Design Review Conference and Post-Design Review Conference Action:

All design review conferences shall be held at Ellsworth AFB, South Dakota. 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 Corrected Final (100 percent) 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 (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.

3.6.6.2 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 final (100 percent) design submittal (one or more) until the Government is satisfied that all review comments have been addressed and resolved.

3.6.6.3 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.

3.6.7 DD FORM 1354, TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY

The Contractor shall provide, for acceptance, a Draft DD Form 1354 "Transfer and Acceptance of Military Real Property" (Copy attached at the end of this section) with the Corrected Final (100 percent) design documents. The Final Form 1354 shall be submitted with the As-Built submittals, near the end of the construction of the project. DD Form 1354 shall be filled out in accordance with Draft Army Pamphlet 405-45 "Real Property Inventory Management", Table B-16 "Preparation of DD Form 1354" (Copy attached) and Army Pamphlet 415-28 "Guide to Army Real Property Codes" (Copy is available at the following website: http://www.usapa.army.mil/gils/). The number of copies and distribution of the Draft and Final DD Form 1354 shall be as shown in the distribution requirements above.

3.7 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 Government Review (Resident Engineer) 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

[Typed Name and Signature of an
Officer of the Contractor's Company]

5. All other Design Submittals

6. Deviations

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

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

DD FORM 1354, FEB 90 ***Previous editions are obsolete.*** USAPPC V1.00

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.

Draft Department of the Army Pamphlet 405-45

Real Property Inventory Management

Table B-16, Preparation of DD Form 1354

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Hammerhead
Gang latrine style constructed mid-1950s to mid-1960s. Has company dining facility at one end, giving T-, or hammer, shape to building.

H-Shape
Gang latrine style constructed in 1950s. Two main sections with connecting piece most commonly constructed in shape of letter H. Sometimes in shape of letter A.

Historic Permanent construction before 1950 (perhaps all were before 1940).
Any permanent construction preceding H-shape.

Other
Post-1950 permanent construction not included in above list

Table B-16
Preparation of DD Form 1354 (Transfer & Acceptance of Military Real Property)

Upon receiving information on a DD Form 1354 the real property office will enter the information in the appropriate fields/screens in the automated real property system. The voucher register will be updated with the information and the DD Form 1354 filed in the real property records.

Purpose. This table provides the procedures for completing DD Form 1354 (Transfer and Acceptance of Military Real Property) by all responsible parties. A DD Form 1354 will be prepared for transfer of construction by the District Engineer, transfer of construction accomplished by the designated facility engineer, acquisitions, construction, disposal, purchased or leased real property, reactivation of excess installations, transfers of real property of non-appropriated fund or non-Army agencies to the government, transfers of accountability for usable research and development and acceptance of other construction, and any other real property accountability action.

Detailed Instructions. DD Form 1354 will be filled in as

follows:

1. From: This block will include the name of the transferring agency: organization, installation, division, etc. It will also include the address and zip code. This information is for those performing the work or making the transfer.

---

2. Operating Unit: For other than Army use.

---

3. District Code: For other than Army use.

---

4. Operating Agency: For other than Army use.

---

5. Date: This is the preparation date of the DD Form 1354.

---

6. Job Number: The job number depends on who initiates the job. If the Director of Engineering and Housing (DEH) or the Director of Public Works (DPW) initiates the job then they will put a job number in this block and it will relate to a special project (for contract) or a DA 4283 job order (in house).

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7. Serial Number: This is the voucher number at source, e.g., DPW, COE.

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8. Contract Number: If a project has been let to a contractor then the contract number will be that assigned by the contracting office in the Director of Contracting or the District Engineer contracting office.

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9. To: This will include the name of the receiving organization, installation, division, etc. where the work has been performed or where the transfer has been made. The address and zip code will also be included.

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10. Operating Unit: Other than Army Use.

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11. District Code: Other than Army use.

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12. Operating Agency: Other than Army Use.

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13. Accounting Number: Other than Army Use.

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14. Accountable Officer Number: Other than Army Use.

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15. Type of Transaction: This will identify whether it is new construction, capital improvement or other. It will also indicate whether it is the final cost of the project, beneficial occupancy or physical completion The District Engineer or in house project officer must indicate on the DD Form 1354 whether cost shown is preliminary (for Beneficial Occupancy/Physical Completion DD Forms 1354) or final cost. If it is a preliminary (estimated cost) the real property officer will create a suspense file to ensure that the district furnishes an updated DD Form 1354 with final construction cost. Update to the database should be handled accordingly. Final costs may take several years if legal claims are involved.

a. Block A: Insert an 'X' in the appropriate box of block A to indicate whether the transaction involves new construction, transfer of existing facilities or capital improvements to existing facilities. If the "Other" box is used, explain the transaction in Item 31, "Remarks" on the back of the DD Form 1354.

b. Block B: If block A has been checked for new construction then use this block to indicate whether transaction is being made at time of beneficial occupancy, physical completion, or financial completion. If the "Other" box is used, explain the transaction in Item 31, "Remarks" on the back of the DD Form 1354.

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16. Project Number: Enter the project number and code number assigned to identify the project. For construction,

enter the public law authorizing the work.

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17. Item Number: Identify each entry on the DD Form 1354 by giving it an item number. Each portion of a facility with a unique DA PAM 415-28 category code must be identified with a separate line number.

---

18. Category Code: This column will identify the five-digit design use category code associated with the design of the facility as indicated in the DA PAM 415-28. Each facility may have more than one design use; however, they must be identified as separate items in block 17.

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19. Facility (Category Description): The description for the facility will be entered as it relates to the category short title in the DA PAM 415-28. Each facility number should be identified in this field as it relates to the construction.

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20. Number of Units: Self-explanatory.

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21. Type: This will indicate the type of construction: "P" = Permanent, "T" = Temporary and "S" = Semi-permanent.

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22. Unit of Measure UM1, UM2: This indicates the gross area or capacity of a facility as it relates to the design use category code of the facility. See DA PAM 415-28.

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23. Total Quantity: This indicates the total quantity of the facility as it relates to the unit of measure assigned to the facility: e.g., UM1 = square feet (SF), acres (AC) or square yards (SY), UM2 = each (EA), families (FA), etc.

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24. Cost: Cost for each line item entry must be entered. All engineering, design and inspection costs associated with a project must also be captured on the DD Form 1354.

a. If the cost is the final cost figure for the line

item it will carry an alphabetical suffix of "F" indicating that it is a final cost. If the cost is preliminary it will contain a "P" indicating it to be a preliminary cost and not final.

b. If the cost is a capital improvement to an existing facility previously accounted for, enter only the amount which will increase the cost of the real property, i.e., enter the amount by which the general ledger balance is to be increased.

c. All engineering, design and inspection costs will be entered on the DD Form 1354 for the real property office to capitalize as project costs. These will be identified as a separate entry.

Types of funds are mandatory and will be shown in column 24 or column 26 (i.e.: MCA, Housing, and NAF).

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25. Drawing Number: Indicates the number assigned to a particular drawing of a construction project as it relates to the different components to a facility: the architectural drawing would be number one, the plumbing would be number two, etc. Using the old manual system the drawing numbers would relate to
each page of the project, however, now that the automated system of CADD is operational at many installations this is not the case.

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26. Remarks: Self-evident. This field may be used to note any information about the drawing numbers, project number, reason for the DD Form 1354: change in unit of measure, reason for increase/decrease in cost, etc.

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27. Statement of Completion: Indicates the signature/title of the individual responsible for the transfer of the facility/equipment. The date is self explanatory, however, the date must be prior to or the same as the date of acceptance in item 28 on the 1354.

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28. Accepted By: Indicates the signature/title of the individual responsible for accepting the transfer of such properties. The date is self-explanatory.

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29. Property Voucher Number: This number will be assigned sequentially by the receiving real property office to indicate the voucher occurrence that the transaction was accepted/vouchered.

Example: V123-90, This indicates that this is the 123rd voucher for FY 90. When an installation transfers from one to another, the losing installation fills in block 7 and the gaining block 29.

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30. Construction Deficiencies: This should indicate any deficiencies of the design or construction of the project.

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31. Remarks: Self-explanatory. If the "Other" box is checked in item 15 an explanation should be noted in the "Remarks" column.

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01355

ENVIRONMENTAL PROTECTION

10/00

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SECTION 01355

ENVIRONMENTAL PROTECTION
10/00

PART 1 GENERAL

Attachments: State of South Dakota Department of Environment and Natural Resources, Authorization to Discharge Under the Surface Water Discharge System Permit #SDR100000.

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. AIR FORCE (USAF)

AFI 32-1053	Pest Management Program

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

33 CFR 328	Definitions
40 CFR 68	Chemical Accident Prevention Provisions
40 CFR 152 - 186	Pesticide Programs
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 279	Standards for the Management of Used Oil
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification
49 CFR 171 - 178	Hazardous Materials Regulations

ELLSWORTH AIR FORCE BASE

SPCCP	Spill Prevention and Control Counter-Measurement Plan
SWPPP	Storm Water Pollution Prevention Plan

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(1996) U.S. Army Corps on Engineers Safety and Health Requirements Manual
WETLAND MANUAL	Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

1.2.4 Installation Pest Management Coordinator

Installation Pest Management Coordinator (IPMC) is the individual officially designated by the Installation Commander to oversee the Installation Pest Management Program and the Installation Pest Management Plan.

1.2.5 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor shall discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" shall occur. Land Application shall be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.6 Pesticide

Pesticide is defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.2.7 Pests

The term "pests" means arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.2.8 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency.

1.2.9 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.2.10 Wetlands

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with WETLAND MANUAL.

1.3 GENERAL REQUIREMENTS

The Contractor shall 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 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 01332 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Environmental Protection Plan; G-RE

The environmental protection plan.

1.7 CERTIFICATION REQUIREMENTS

An environmental agency may require design and construction documents to be certified by a Professional Engineer (PE) registered in the State of South Dakota. The Contractor shall comply with the certification requirements of the environmental regulatory agencies.

1.8 ENVIRONMENTAL COORDINATION, PERMITS, NOTICES, REVIEWS AND/OR APPROVALS

The Contractor shall be responsible for contacting the appropriate Federal, State, Regional, and local environmental agencies to identify all required environmental permits (construction and operating), notices, reviews, and approvals required for the project. Once the requirements are identified, the Contractor shall be responsible for coordinating the requirements with Ellsworth's Environmental Flight and the Contracting Officer in regard to implementation for a Federal Facility project. The Contractor shall ensure that all coordination, permits, notices, reviews and/or approvals are completed and submitted with each applicable phase of the design. Prior to construction starting for any phase, the Contractor shall assure that all permits and/or approvals are received and copies are submitted to the Contracting Officer. The Contractor shall be responsible for any contract delays resulting from failure to obtain environmental permits, notices, reviews and/or approvals when required.

1.8.1 Applications, Supporting Documents, and Fees

The Contractor shall obtain and complete all environmental permit applications and notices including any documents required for a modification for an existing permit held by the Facility. The Contractor is responsible for preparing all supporting documents, including but not limited to engineering reports, emission surveys, diagrams, pollutant load calculations, etc. If, in lieu of permits, the governing agency requires review and approval of the design, the Contractor shall submit and obtain approval of the design and associated documents. The Contractor shall be responsible for all fees associated with the permits, applications, reviews, approvals, and notices.

1.8.2 Replace Family Housing Environmental Permits, Notices, Reviews, and/or Approvals

The following is a listing of permits, notices, reviews, and/or approvals which **may be** required for this project. This listing and requirements are not to be considered all-inclusive by the Contractor, but is provided as information that may be used in successfully accomplishing the environmental compliances. See Internet site

http://www.state.sd.us/denr/ENVIRO/index.htm for South Dakota's Environmental Permitting and Regulation Guide.

a. The State of South Dakota has authority for the National Pollutant Discharge Elimination System (NPDES) program. Ellsworth Air Force Base (EAFB) has been issued a South Dakota Department of Environmental and Natural Resources Authorization to Discharge Under the Surface Water Discharge System, Permit Number SD-0000281. This permit allows EAFB to discharge storm water from seven drainage systems across the base. The Storm Water Pollution Prevention Plan SWPPP is a requirement of this permit. The SWPPP may be reviewed at the Civil Engineer, Environmental Flight Office. The Contractor shall be responsible for coordination with the Environmental Flight for possible modifications to this permit for surface drainage discharges.

b. If construction activities results in disturbance of 1 acre of land or more (sites that may be smaller than 1 acre but are part of common plan of development are considered to be over 1 acre), coverage under the State of South Dakota Department of Environment and Natural Resources' (SDENR), Authorization to Discharge Under the Surface Water Discharge System Permit #SDR100000 is required. If the current permit is revised by the State of South Dakota to requiring the permit for a project disturbing less than 1 acre, the Contractor shall be responsible for the applying for coverage under the permit. The Contractor shall be responsible for implementing the terms and requirements of the permit and shall be considered the "permittee". The Contractor shall complete and submit a Notice of Intent (NOI) and the Notice of Termination (NOT)in accordance with Permit #SDR100000 and shall be considered the "Facility Operator". The Contractor shall not begin construction until an authorization letter from the State granting coverage for the storm water discharges is received. The Contractor shall be responsible for posting a copy of the NOI and the authorization letter at the construction site in a prominent place for public viewing. The Contractor shall prepare and implement a Storm Water Pollution Prevention Plan, inspections, and reporting in accordance with the SD#100000. Any temporary or permanent erosion and sedimentation control measures shown on the drawings shall be incorporated into the Contractor's Storm Water Pollution Prevention Plan. The Contractor shall be responsible for assuring that their SWPPP is in accordance with EAFB's SWPPP (identified in the above paragraph). The Contractor shall retain copies of the storm water pollution prevention plan and all reports in accordance with the permit. All submissions to the State shall be by certified mail. The Contractor shall include copies of all submittals to the State of South Dakota, plans, and reports in the Appendix to the Environmental Protection Plan.

c. Ellsworth AFB has a State of South Dakota Air Permit for the whole facility. The Contractor shall coordinate all air pollutant emissions with Ellsworth AFB Environmental Flight for possible modifications and/or permit to construct.

d. No soil may be removed off-site without approval from EAFB Environmental Flight and the Contracting Officer.

e. Drinking water, stormwater and sanitary sewer approval of plans

and specifications is required by the State of South Dakota prior to construction commencing. These plans and specifications shall be sent to the South Dakota Department of Environment and Natural Resources (DENR) ATTN: Ray Birchem, Staff Engineer; Joe Foss Building; 523 East Capitol Avenue; Pierre, South Dakota, 57501; for review and approval. The plans and specifications shall be submitted with a cover letter requesting a review and approval. The plans and specifications are required to have a stamp and signature of a registered engineer from the State of South Dakota. A copy of the request shall be forwarded to the Ellsworth Environmental Flight Office and the COR. The State of South Dakota may take up to 30 days for approval.

1.9 ENVIRONMENTAL PROTECTION PLAN

During the initial design phase, the Contractor shall submit an Environmental Protection Plan for compliance review and acceptance by the Contracting Officer. For each additional submittal phases, the plan shall be updated and submitted for compliance review and acceptance by the Contracting Officer. Prior to construction, the Contractor shall meet with the Contracting Officer for the purpose of discussing the implementation of the environmental plan, possible subsequent additions and revisions to the plan including any reporting requirements, and methods for administration of the Contractor's environmental plans. The Contractor shall maintain a current version of the Environmental Protection Plan on site for review by interested parties.

1.9.1 Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, submitting for compliance review, and implementing any additional requirements to be included in the Environmental Protection Plan.

1.9.2 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 Ellsworth AFB Spill Prevention and Control Counter-Measurement 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 Contracting Officer, Ellsworth AFB Fire Department, and Ellsworth AFB Environmental Flight in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

3. Training requirements for Contractor's personnel and methods of accomplishing the training.

4. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

6. The methods and procedures to be used for expeditious contaminant cleanup.

k. A non-hazardous solid waste disposal plan identifying methods and

locations for solid waste disposal including clearing debris. The plan shall include schedules for disposal. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction. The Contractor shall attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. The report shall be submitted on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and shall be for the previous quarter (e.g. the first working day of January, April, July, and October). The report shall indicate the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.

l. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. The plan shall detail the Contractor's actions to comply with and to participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

m. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become airborne 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. The Contractor shall furnish a copy of the initial and all updated contaminant prevention plans including each MSDS and quantities to Ellsworth AFB's Environmental Flight.

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 resources biological resources and wetlands plan that defines procedures for identifying and

protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project site: **and/or** identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during design or construction. The plan shall include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Contracting Officer.

q. If applicable, a pesticide treatment plan shall be included and updated, as information becomes available. The plan shall include: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. The Contractor is responsible for Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation specific requirements. The Contractor shall follow AFI 32-1053 Sections 3.4.13 and 3.4.14 for data required to be reported to the Installation.

r. If applicable, a freon disposal plan shall be included and updated, as information becaomes available. If the Contractor does not reuse or sell refrigerators left in the structures, the Contractor will develop a freon removal plan that shall include: quanitites of freon that will be removed from refrigerators before disposal, recycling plan, and qualifications of technicians performing freon removal. Use 40 CFR 82 as a reference.

1.9.3 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.

1.10 PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite 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.

1.11 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.

1.12 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.

3.1.1 Work Area Limits

Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are not to be disturbed shall be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.1.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of

the approved work area.

3.1.3 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. The Contractor shall construct or install temporary and permanent erosion and sediment control best management practices (BMPs). BMPs may include, but not be limited to, vegetation cover, 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.

3.1.4 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.2 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated. All water areas affected by construction activities shall be monitored by the Contractor. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.2.1 Wetlands

The Contractor shall not enter, disturb, destroy, or allow discharge of contaminants into any wetlands.

3.3 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal and State air emission and performance laws and standards.

3.3.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants; shall be controlled at all times, including weekends, holidays and hours when work is not in progress. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas

within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations.

3.3.2 Odors

Odors from construction activities shall be controlled at all times. The odors shall not cause a health hazard and shall be in compliance with State regulations and/or local ordinances.

3.3.3 Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise.

3.3.4 Burning

Burning shall be prohibited on the Government premises.

3.4 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.4.1 Solid Wastes

Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. Handling, storage, and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill shall be the minimum acceptable off-site solid waste disposal option. The Contractor shall verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate.

3.4.2 Chemicals and Chemical Wastes

Chemicals shall be dispensed ensuring no spillage to the ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. This documentation will be periodically reviewed by the Government. Chemical waste shall be collected in corrosion resistant, compatible containers. Collection drums shall be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes shall be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations. All hazardous materials brought on the facility shall be bar coded and tracked by the Ellsworth AFB's HAZMART. The Contractor shall contact the HAZMART office prior to hazardous materials being brought on the facility to arrange for on-site bar coding and tracking by the HAZMART

office.

3.4.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. The Contractor shall, at a minimum, manage and store hazardous waste in compliance with 40 CFR 262 and shall manage and store hazardous waste in accordance with the Installation hazardous waste management plan. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. The Contractor shall segregate hazardous waste from other materials and wastes, shall protect it from the weather by placing it in a safe covered location, and shall take precautionary measures such as berming or other appropriate measures against accidental spillage. The Contractor shall be responsible for storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations. The Contractor shall contact Ellsworth AFB's HAZMART office to arrange for acceptance of any Contractor generated hazardous waste. No hazardous waste will be taken off the facility by the Contractor. Unused or partially used containers of hazardous materials (i.e., paint, adhesives) are not hazardous waste and will be taken off the factility for reuse by the Contractor. 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.

3.4.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations. There shall be no storage of fuel on the project site. Fuel must be brought to the project site each day that work is performed.

3.4.5 Waste Water

Disposal of waste water shall be as specified below.

a. Waste water from construction activities, such as onsite 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.

b. Ground water shall not be pumped or discharged without prior approval from the Contracting Officer.

c. Water generated from the flushing of lines after disinfection or disinfection in conjunction with hydrostatic testing shall be land

applied in accordance with all Federal, State, and local laws and regulations for land application or discharged into the sanitary sewer with prior approval and/or notification to the Waste Water Treatment Plant's Operator.

3.5 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

3.6 NON-HAZARDOUS SOLID WASTE DIVERSION REPORT

The Contractor shall maintain an inventory of non-hazardous solid waste diversion and disposal of construction and demolition debris. The Contractor shall submit a report to Ellsworth AFB's Environmental Flight through the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that non-hazardous solid waste has been generated. The following shall be included in the report:

a. Construction and Demolition (C&D) Debris Disposed = _____ in cubic yards or tons, as appropriate.

b. Construction and Demolition (C&D) Debris Recycled = _____ in cubic yards or tons, as appropriate.

c. Total C&D Debris Generated = _____ in cubic yards or tons, as appropriate.

d. Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount) = _____ in cubic yards or tons, as appropriate.

3.7 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other humanm historical activities. Upon such discovery or find, the Contractor shall immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in impact to or the destruction of these resources. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.8 BIOLOGICAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations.

3.9 INTEGRATED PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, the Contractor, through the Contracting Officer, shall coordinate with the Installation Pest Management Coordinator (IPMC) at the earliest possible time prior to pesticide application. The Contractor shall discuss integrated pest management strategies with the IPMC and receive concurrence from the IPMC through the COR prior to the application of any pesticide associated with these specifications. Installation Pest Management personnel shall be given the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. The use and management of pesticides are regulated under 40 CFR 152 - 186.

3.9.1 Pesticide Delivery and Storage

Pesticides shall be delivered to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Pesticides shall be stored according to manufacturer's instructions and under lock and key when unattended.

3.9.2 Qualifications

For the application of pesticides, the Contractor shall use the services of a subcontractor whose principal business is pest control. The subcontractor shall be licensed and certified in the state where the work is to be performed.

3.9.3 Pesticide Handling Requirements

The Contractor shall formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and shall use the clothing and personal protective equipment specified on the labeling for use during all phases of the application. Material Safety Data Sheets (MSDS)shall be available for all pesticide products.

3.9.4 Application

Pesticides shall be applied by a State Certified Pesticide Applicator in accordance with EPA label restrictions and recommendation. The Certified Applicator shall wear clothing and personal protective equipment as specified on the pesticide label. Water used for formulating shall only come from locations designated by the Contracting Officer. The Contractor shall not allow the equipment to overflow. Prior to application of pesticide, all equipment shall be inspected for leaks, clogging, wear, or damage and shall be repaired prior to being used.

3.10 PREVIOUSLY USED EQUIPMENT

The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. The Contractor shall consult with the USDA jurisdictional office for additional cleaning requirements.

3.11 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.12 MILITARY MUNITIONS

In the event the Contractor discovers or uncovers military munitions as defined in 40 CFR 260, the Contractor shall immediately stop work in that area and immediately inform the Contracting Officer.

3.13 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. The Contractor shall document all attendess with date of attendance for all meetings held. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.14 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". The Contractor shall, unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

-- End of Section --

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SECTION 01400

SPECIAL SAFETY REQUIREMENTS

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SECTION 01400

SPECIAL SAFETY REQUIREMENTS
05/00 Rev 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.

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

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH Pub No. 84-100	(1984; Supple 1985, 1987, 1988 & 1990) NIOSH Manual of Analytical Methods

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 and a copy is included on the CD-ROM issued with this solicitation. 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.

If the Contractor intends to demolish the buildings with asbestos-containing materials (sheetrock mud) in place, all requirements in this section pertaining to asbestos and lead shall be followed. If the Contractor intends to remove asbestos-containing materials (reflectors in light fixtures and firestop gypsum board) prior to demolition, only the lead requirements of this section apply, and removal requirements specified in Section 13280A ASBESTOS ABATEMENT shall be followed. Buildings may also

contain mercury switches in thermostats and PCBs in light ballasts (see Section 13286N HANDLING OF LIGHT BALLASTS AND LAMPS CONTAINING PCBS AND MERCURY for instructions)

1.2.2 Description of Work

This project involves the replacement of family housing units at Ellsworth AFB,SD.

1.3 PRECONSTRUCTION CONFERENCE

See Contract Clause "PRECONSTRUCTION CONFERENCE". A preconstruction conference will be scheduled prior to beginning of site work. Requirements relative to planning and administration of the overall safety program will be discussed.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan; G-RE

The written site-specific Accident Prevention Plan.

1.5 ACCIDENT PREVENTION PLAN

The Contractor shall submit, prior to the start of on site construction activity, a proposed accident prevention plan which shall be the accident prevention policy to be followed by all of the Contractor's and subcontractor's personnel and supervisory staff during performance of the work.

1.5.1 Requirements

The proposed plan shall be developed after a careful analysis of the work involved and shall be tailored specifically to the conditions of this project. The Contractor's accident prevention plan shall contain, as a minimum, the following general information or procedures for the activity indicated. The Contractor shall submit his plan for review and acceptance prior to commencing work.

1.5.1.1 Responsible Individual(s)

The Contractor shall designate an onsite employee as the individual responsible for insuring the accident prevention plan is implemented and enforced.

1.5.1.2 Subcontractor Supervision

Explain procedures to assure that subcontractor(s) fully comply with the accident prevention plan.

1.5.1.3 Indoctrination of New Employees

The plan shall include provisions for advising workers of the purpose of the accident prevention plan, specific hazards on the job and precautions to be taken, emergency procedures, information concerning tool box safety meetings, required protective equipment, cleanup rules and location of company safety rules (posting or handout).

1.5.1.4 Tool Box Safety Meetings

Hold weekly "Tool Box" safety meetings. Timely safety subjects shall be determined by a responsible individual. Employees will be informed of time, location, who will conduct, and subject. Identify procedures for including subcontractors. The Contractor shall provide a copy of the Weekly Tool Box Meeting and Monthly Supervisor's Safety Meeting to the Contracting Officer.

1.5.1.5 Fire Prevention and Protection

Identify source of fire protection. Insure adequate fire extinguishers, water barrels, or other fire-fighting equipment is located on site. Explain prevention activities to include storage areas and special hazards such as welding and use of flammable liquids, and other special hazards.

1.5.1.6 Housekeeping

Daily cleanup of all debris and waste materials is required. Adequate disposal containers should be placed strategically around the site. Debris shall be removed on a regular basis. Explain procedures that include use of barrels, dumpsters, trash chutes, etc.

1.5.1.7 Mechanical Equipment Inspection

All mechanical equipment (trucks, cranes, forklifts, backhoes, graders, etc.) shall be inspected prior to use and at fixed intervals throughout the life of the contract. Explain how inspections will be accomplished (frequency, by whom, and records to be kept).

1.5.1.8 First Aid and Medical Facilities

First aid facilities shall be made available on the job site. Arrangements for emergency medical attention shall be made prior to start of work. All emergency numbers (doctor, hospital, ambulance, fire department) shall be posted at the project superintendent's office.

1.5.1.9 Sanitation

Include provisions for toilet facilities, drinking water and washing facilities. A sufficient number of toilet facilities as specified in EM 385-1-1 shall be provided unless permission is granted to use existing facilities (portable chemical are authorized). Insure safe drinking water and individual cups are available. For the projects where corrosive or toxic materials are used, separate washing facilities are required.

1.5.1.10 Safety Promotions

The Contractor shall promote accident prevention. Identify method (posters, awards etc.).

1.5.1.11 Accident Reporting

All accidents (employee injuries, vehicle, building, or equipment damage etc.) regardless of their severity, shall be reported to the onsite government representative or to the area engineer, who in turn will advise the Contractor of forms to be submitted and timeframes.

1.5.1.12 Job Hazard Analysis

When job situations change and it is necessary to alter safety requirements, a Job Hazard Analysis will be accomplished, documented, and added as an addendum to the Accident Prevention Plan. Each Job Hazard Analysis shall include, but not be limited to, a description of the work, probable hazards related to that work and positive precautionary measures to be taken to reduce or eliminate each hazard. An example of changing situations may be new subcontractors performing work such as earth moving, trenching, concrete work, roofing, electrical, masonry etc. The onsite government representative will determine the format and amount of detail required of the written plan.

1.6 RADIOLOGICAL EQUIPMENT

In addition to any applicable Nuclear Regulatory Commission, state, local, or other federal licenses or permits, and in accordance with requirements of EM 385-1-1, Safety and Health Requirement Manual, the Contractor is required to obtain a service permit to use, store, operate, or handle a radiation producing machine or radioactive materials on a Department of Defense (DOD) Installation. The service permit shall be obtained from the appropriate U.S. Army or U.S. Air Force Command through the Contracting Officer's representative. The Contractor should notify the Contracting Officer during the prework conference if a radiation producing device will be utilized on a DOD Installation in order to determine the permit application requirements, and allow a lead time of 45 days for obtaining a permit.

1.7 EXCAVATION AND TRENCHING

The standards for excavation and trenching are outlined in 29 CFR 1926, Subpart P. These standards shall be followed in addition to those outlined in EM 385-1-1.

1.8 ASBESTOS AND LEAD PAINT

1.8.1 Safety Plans

The accident prevention plan shall contain distinct sections entitled Lead Safety Plan and Asbestos Safety Plan. Each section will address the following topics: qualifications of the competent person, laboratory qualifications, personal air monitoring, exposure assessment, work practices for specific Class II asbestos activities, engineering controls to reduce exposure, personal protection equipment, respiratory protection program, hygiene facilities and practices, medical surveillance, employee training, housekeeping, and waste containerization, labeling and disposal.

1.8.2 Safety and Health Oversight

Work which may expose personnel to asbestos and lead paint shall be supervised by a Competent Person as defined in 29 CFR 1926.1101 and 29 CFR 1926.62 and as required in paragraph: Qualifications of this section. The

Competent Person shall be able to identify existing and predictable asbestos and lead paint hazards and shall have the authority to take corrective measures to eliminate them. Personal air monitoring shall be overseen by the Competent Person.

1.8.3 Qualifications

1.8.3.1 Competent Person

a. Asbestos

The Contractor's full-time onsite Competent Person shall meet the competent person requirements of 29 CFR 1926 Section .1101 and shall have completed the EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training accreditation required by 40 CFR 763, Subpart E, Appendix C. The Competent Person shall be experienced in the administration and supervision of asbestos abatement projects, including exposure assessment and monitoring, work practices, protective measures for personnel, setting up and inspecting asbestos abatement work areas, ACM generated waste containment and disposal procedures, decontamination units installation and maintenance requirements, site safety and health requirements, etc. and have had a minimum of 2 years on-the-job experience.

b. Lead Paint

The Contractor's full-time onsite Competent Person shall meet the competent person requirements of 29 CFR 1926 Section .62 and be experienced in administration and supervision of projects involving lead-based paint, including work practices, protective measures for personnel, etc. This person shall have completed a Contractor Supervisor LBP abatement course by an EPA Training Center or an equivalent certification course, and have had a minimum of 2 years on-the-job experience.

1.8.3.2 Testing Laboratory

a. Asbestos

The Contractor shall provide the name, address and telephone number of the independent testing laboratory selected to perform the sample analyses and report the results. The testing laboratory shall be completely independent from the Contractor as recognized by federal, state or local regulations. Written verification, signed by the testing laboratory principal and the Contractor, that the laboratory is fully equipped and proficient in conducting PCM of airborne samples using the methods specified by 29 CFR 1926, Section .1101, OSHA method ID-160, and the most current version of NIOSH Pub No. 84-100 Method 7400. Evidence that the laboratory is currently judged proficient (classified as acceptable) in counting airborne asbestos samples by PCM by successful participation in each of the last 4 rounds in the American Industrial Hygiene Association (AIHA) shall be submitted.

b. Lead Paint

The laboratory performing the analysis shall be an EPA National Lead Laboratory Accreditation Program (NLLAP) accredited laboratory and be rated proficient in the NIOSH/EPA Environmental Lead Proficiency Analytical Testing Program (ELPAT). Currently, the American

Association for Laboratory Accreditation (ASLA) and the American Industrial Hygiene Association (AIHA) are the EPA recognized laboratory accreditors.

1.8.4 Exposure Assessment

1.8.4.1 Asbestos

a. Initial Exposure Assessment

The Contractor's Competent Person shall conduct an exposure assessment immediately before or at the initiation of an asbestos abatement operation to ascertain expected exposures during that operation. The assessment shall be completed in time to comply with the requirements, which are triggered by exposure data or the lack of a negative exposure assessment, and to provide information necessary to assure that all control systems planned are appropriate for that operation. The assessment shall take into consideration both the monitoring results and all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of the operations of the Contractor which indicate the levels of airborne asbestos likely to be encountered on the job.

b. Negative Exposure Assessment

The Contractor may provide a negative exposure assessment for the specific asbestos job covered by this Specification Section. When provided, the Negative Exposure Assessment shall be based on one or more of the following criteria:

(1) Objective Data: Objective data demonstrating that the product or material containing asbestos minerals or the activity involving such product or material cannot release airborne fibers in concentrations exceeding the PEL-TWA and PEL-Excursion Limit under those work conditions having the greatest potential for releasing asbestos.

(2) Prior Asbestos Jobs: Where the Contractor has monitored prior asbestos jobs for the PEL and the PEL-Excursion Limit within 12 months of the current job, the monitoring and analysis were performed in compliance with asbestos standard in effect; the data were obtained during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the Contractor's current operations; the operations were conducted by employees whose training and experience are no more extensive than that of employees performing the current job; and these data show that under the conditions prevailing and which will prevail in the current workplace, there is a high degree of certainty that the monitoring covered exposure from employee exposures will not exceed the PEL-TWA and PEL-Excursion Limit.

(3) Initial Exposure Monitoring: The results of initial exposure monitoring of the current job, made from breathing zone air samples that are representative of the 8-hour PEL-TWA and 30-minute short-term exposures of each employee. The monitoring covered exposure from operations which are most likely during the

performance of the entire asbestos job to result in exposures over the PELs.

1.8.4.2 Lead Paint

For personnel who may be exposed to dust resulting from demolition or removal of painted surfaces, the Contractor is required to perform an exposure assessment to determine personnel exposure levels to lead. This assessment shall consist of personal air monitoring representative of a full shift. Airborne concentrations of lead shall be collected and analyzed in accordance with 29 CFR 1926 Section .62. Results shall be reported in micrograms per cubic meter of air. The Competent Person shall use personal air monitoring results to determine the effectiveness of engineering controls, the adequacy of PPE and to determine if proper work practices are being employed. The Contracting Officer shall be notified if any personal air monitoring result equals or exceeds 30 micrograms per cubic meter of air. The Contractor shall take steps to reduce the concentration of lead in the air. If results are obtained indicating employee exposure below the action level for lead (30 ug/m3) the Competent Person may recommend to the Contracting Officer, in writing, appropriate reductions in employee protection. Alternatively, as determined by the Competent Person, where the Contractor has previously monitored for lead exposures within the past 12 months during work operations conducted under workplace conditions closely resembling the processes, type of materials, control methods, work practices, and environmental conditions used and prevailing in the Contractor's current operations, the Contractor may, upon approval of the Contracting Officer, use this data in making the initial determination of employee exposure.

1.8.5 Employee Protection

Until monitoring results are received which document that the employee is not exposed above the action level for asbestos or lead, the Contractor shall implement employee protective measures as listed below:

1.8.5.1 Respiratory Protection Program

A respiratory protection program shall be established as required by 29 CFR 1926 Section .103, .1101 and .62 and in accordance with 29 CFR 1910 Section .134. A NIOSH-approved respirator and cartridges appropriate to the job, as determined by the Competent Person, shall be furnished to each employee and visitor potentially exposed to airborne asbestos or lead. A fit test shall be conducted in accordance with applicable sections of 29 CFR 1926.

1.8.5.2 Protective Equipment

The Contractor shall furnish, at no cost to personnel, equipment/clothing for protection from airborne and waterborne asbestos and LBP debris. An adequate supply of disposable full-body coveralls, steel toe/shank boots with nonskid soles or impermeable work boot covers, gloves, hard hats and eye protection shall be worn by workers in regulated work areas. Employees shall be instructed in appropriate practices for donning and removing protective equipment. Protective clothing and equipment shall not be removed from the work site at any time.

1.8.5.3 Decontamination Areas

The employer shall establish a decontamination area that is adjacent to the regulated area for the decontamination of employees and their equipment

which is contaminated with asbestos. The decontamination area shall be a designated area shall be covered by an impermeable drop cloth and shall be of sufficient size to accommodate cleaning of equipment and for removing personal protective equipment without spreading contamination beyond the area. The decontamination area shall be established in a manner such that employees must enter and exit the decontamination area through the equipment drop area. Work clothing, must be HEPA vacuumed before it is removed. Equipment and other surfaces shall be cleaned prior to removing the items from the decontamination area. To prevent cross-contamination, the employer shall provide storage facilities for protective work clothing and equipment that are segregated from storage areas for street clothes and non-contaminated equipment. The employer shall also assure that employees do not leave the workplace wearing any protective clothing or equipment that is required to be worn during the work shift.

1.8.5.4 Handwashing Facilities

The employer shall provide adequate handwashing facilities for use by employees in accordance with 29 CFR 1926.51(f) and shall assure that employees wash their hands and face at the end of the work-shift.

1.8.5.5 Medical Surveillance

a. Asbestos

Before being exposed to airborne asbestos fibers, workers shall be provided with a medical examination as required by 29 CFR 1926, Section .1101(m) and other pertinent state or local requirements. This requirement shall have been satisfied within the last 12 months. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation. X-ray films of asbestos workers shall be identified to the consulting radiologist and medical record jackets shall be marked with the word "asbestos."

b. Lead Paint

Medical surveillance for lead shall comply with the requirements of 29 CFR 1926 Section 62(j) and other pertinent state or local requirements. Analysis for blood lead and zinc protoporphyrin levels shall be included in the examination portion of the medical surveillance program.

1.8.5.6 Training

a. Asbestos

Workers conducting Class II asbestos work shall be provided training prior to the time of job assignment and, at least, annually. Training shall include, at a minimum the elements specified in 29 CFR 1926 Section .1101(k)(9)"Employee Information and Training".

b. Lead Paint

Workers potentially exposed to lead-contaminated dust shall be provided training regarding lead hazards prior to the time of job assignment and, at least, annually. Training shall include, at a minimum the elements specified in 29 CFR 1926 Section .62(l) "Employee Information and Training".

1.12.6 Engineering Controls

Engineering controls shall be employed to maintain the integrity of the asbestos material and lead paint and to minimize the potential for release of asbestos fibers or generation of lead-containing dust. To the degree possible, asbestos-containing materials shall not be cut, ground, abraded or handled in any other manner that may render the material friable as described in 40 CFR 61, Subpart M and OSHA 29 CFR 1926.1101. The contractor shall describe proposed engineering control methods and practices in the lead safety and asbestos safety portions of the accident prevention plan."

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

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CONTRACTOR QUALITY CONTROL

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SECTION 01451A

CONTRACTOR QUALITY CONTROL
07/01; Omaha Rev. 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 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

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 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. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.1 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project 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, 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 will be approved by the Contracting Officer.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified

deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.3 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 10 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the 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 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 construction person with a minimum of 5 years in related work. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned no other duties. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

3.4.3 CQC Personnel

A staff shall be maintained under the direction of the CQC system manager to perform all QC activities. The staff must be of sufficient size to ensure adequate QC coverage of all work phases, work shifts, and work crews involved in the construction. These personnel may perform other duties, but must be fully qualified by experience and technical training to perform their assigned QC responsibilities and must be allowed sufficient time to carry out these responsibilities. The QC plan will clearly state the duties and responsibilities of each staff member.

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.

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 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 Area or Resident Office (as directed)

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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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01670

RECYCLED / RECOVERED MATERIALS

12/01

-- End of Section Table of Contents --

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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FINAL FOUNDATION ANALYSIS
REPLACE FAMILY HOUSING PHASE III
ELLSWORTH AIR FORCE BASE, SOUTH DAKOTA
18 April 2003

1. Scope

The results of the foundation investigation and analysis for the Replace Family Housing Phase 3 project at Ellsworth Air Force Base, South Dakota 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 demolition of existing housing units by the Base and construction of 75 housing structures by the Contractor. Houses will be single story units with a crawl space having 44 inches of clear space. Including the slab, the below grade portion of the structures will extend to a depth of approximately 4 feet. Also included in the project are paved drives, parks and playgrounds.

3. Subsurface Investigations

3.1. General

The field investigation for the Replace Family Housing Phase 3 project was conducted from January 30 through February 4, 2003 by an Omaha District drill crew. The exploratory program consisted of ten test borings numbered sequentially from EL03-1 through EL02-10, with holes 1 and 10 having a “P” suffix denoting completion as temporary piezometers. A private contractor, Jim Theis, staked the boring locations and completed utility clearances. The borings were advanced with a Gus Pech 1100C truck- mounted soil-sampling rig using 4 3/8-inch inside diameter (I.D.) hollow stem augers with a 4 1/4-inch bullet bit. Borings EL03-1P and EL03-10P were drilled to a depth of 25 feet; all other borings were drilled to a depth of 20 feet. Holes not completed as piezometers were abandoned by filling with a high solids (30%) bentonite grout. After settlement of the grout the holes were topped-off with soil.

TABLE 1: Summary of Borings

Boring Number	Date Drilled	Total Depth (ft)	Water During Drilling (ft)	Water After Drilling (ft)
EL03-1P	30-Jan-2003	25	16.7	14.75
EL03-2	31-Jan-2003	20	Not Encountered	Not Recorded
EL03-3	31-Jan-2003	20	18.0	Not Recorded
EL03-4	31-Jan-2003	20	11.5	Not Recorded
EL03-5	31-Jan-2003	20	17.0	Not Recorded
EL03-6	31-Jan-2003	20	Not Encountered	Not Recorded
EL03-7	31-Jan-2003	20	14.0	Not Recorded
EL03-8	31-Jan-2003	20	Not Encountered	Not Recorded

Boring Number	Date Drilled	Total Depth (ft)	Water During Drilling (ft)	Water After Drilling (ft)
EL03-9	30-Jan-2003	20	Not Encountered	Not Recorded
EL03-10P	30-Jan-2003	25	17.5	14.5

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 in borings EL03-4, EL03-5, EL03-6 and EL03-9. 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 via Federal Express 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, and swell/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 attached to this report and are available from the Geotechnical Branch, Soils Section A, of the Omaha District.

5. Site Conditions

5.1. General Geology

Ellsworth AFB is located in the unglaciated Missouri Plateau Section of the Great Plains Physiographic Province. The section is characterized by old plateaus, terraces, and local badlands. Eight miles west of Ellsworth AFB tilted sandstone beds form the hogback ridges that separate the Black Hills Section from the Missouri River Section of the Great Plains Province. Bedrock in the vicinity of Ellsworth AFB is the Cretaceous Pierre Shale, a dark gray to black, non-calcareous marine shale that weathers to plastic, brown to olive-brown clay. Faulting of the Pierre Shale in the immediate study area has not been documented. Bedrock dips gently to the east and is capped by remnants of Quaternary (Pleistocene) terrace deposits laid down by eastward-flowing streams. Ellsworth AFB is located on the south flank of the terrace ridge that separates Elk Creek and Box Elder Creek valleys. Drainage in the vicinity is generally eastward, with streams being tributaries of the Cheyenne River.

5.2. Site-Specific Geology

The site is currently a residential area containing single-story houses, grassed lawn and common areas, paved roads and parking areas. The upper 5 to 10 feet of each boring was comprised of medium plasticity clay with fine to medium grained sand and trace amounts of gravel. This material had a liquid limit of approximately 40 to 56 and classified as either CL or CH. The interval from approximately 7 to 18 feet consisted mainly of poorly sorted sand and gravel with silt and cobbles that classified as GM, GP-GM, GP-GC and SP-SC. Refusal of the augur was encountered at a depth of 14 feet in boring EL03-6 due to a suspected large cobble or boulder. Underlying the sand and gravel was weathered shale exhibiting very high plasticity. Liquid limits of the tested samples of this material ranged from 87 to 126. An exception to this sequence was encountered in boring EL03-3, which had no sand layer. Although the sand content of the upper clay layer increased with depth, weathered shale was found at a depth of approximately 8 feet bgs.

5.3. Ground Water

Ground water was encountered during drilling in 6 of the 10 borings during drilling, at depths ranging from 11.5 to 18 feet below the surface. In general, ground water was found at or near the contact between weathered shale bedrock and the overlying granular material. Borings EL03-1P and EL03-10P were converted to temporary piezometers to obtain more accurate ground water depths. The piezometers were installed at the bottom of the boring so that the screen straddled the top of the water-bearing zone. Each piezometer consists of 2-inch-nominal PVC riser with a 10-foot long 0.010-inch PVC screen. The filter pack consists of 20/40 Silica Sand placed around the screen to approximately two feet above the screen. A 2 to 3 foot bentonite seal consisting of 1/4" inch bentonite pellets was placed on top of the filter pack, and the remaining annulus filled to 1 foot (bgs) with 30% solids bentonite grout. Surface completion consists of a concrete pad and a 4-inch square

steel, lockable protective cover. Stabilized water levels in these two piezometers were reported as 14.75 and 14.5 feet below the surface, respectively. Based on these observations, ground water is not anticipated within 10 feet of the existing surface. Ground water levels may fluctuate in response to seasonal and long-term variations in precipitation, and the water levels in these piezometers should be monitored periodically and immediately before the start of construction to determine if changes are occurring. Dewatering of excavations is not anticipated to be necessary in view of the shallow depth at which the planned crawl spaces are located and the additional depth to which over excavations below them will reach.

5.4. Seismic Evaluation

In reference to 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", Ellsworth AFB has a 0.2 second Spectral Response Acceleration (S_s) of 0.145g and a one second spectral response acceleration (S_1) of 0.040g. These 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 0.145)= 0.232.

The 1 Second Period Spectral Acceleration ($S_{M1} = F_v S_1$) for site class D is (2.4 x 0.040)= 0.096.

6. Subsurface Recommendations

6.1. General

Soils at the project site consist primarily of lean to fat clay overlying poorly-graded sand and gravel with weathered shale bedrock below that. High plasticity clay was encountered at this site is not suitable for use as structural fill. This material is suitable for use in general grading away from structures. Weathered shale should not be used for fill as it has poor engineering properties and is difficult to work. 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 Recommendations

6.2.1. Shallow Spread and Continuous Footings

The recommended foundation type for this design is shallow spread and continuous footings bearing on a layer of compacted structural fill material to reduce the potential for movement caused by swelling soil. Standard Penetration Test blow counts were 10 or greater blows per foot of penetration in all intervals but one; a value of 6 blows per foot was recorded in weathered shale at approximately 18 feet below the surface in boring EL03-7. These results indicate generally favorable conditions from a bearing capacity standpoint. Footings bearing on the layer of structural fill described below may be designed for an allowable excess bearing capacity of 2000 psf. This value represents the maximum allowable bearing pressure at the base of the footings in excess of that due to existing surrounding overburden. With structural fill reducing the potential for swell induced movement, there is no minimum bearing pressure required.

All exterior footings for heated structures should be founded a minimum of 4.0 feet below final exterior grade to provide adequate frost protection.

All footings for unheated structures should be founded a minimum of 5.0 feet below final exterior grade to provide adequate frost protection.

6.1.1 Structural Fill

Atterberg Limits tests indicate that soils from the surface to the underlying sand and gravel possess moderate to high plasticity. Because of that, a minimum of 4 feet of this material should be removed and replaced with compacted structural fill. The over excavation must extend below footings and floor slabs to a point 3 feet beyond the foundation walls. Structures attached to the buildings, such as stoops and porches should also be underlain by an equal thickness of structural fill to prevent differential movement with respect to the houses. The top 18 inches of material exterior to the walls should consist of cohesive fine-grained native soils to limit infiltration of surface water and promote vegetation growth. Where sidewalks abut the structure, the structural fill may be extended to the surface if desired. The characteristics the structural fill must possess include the following:

- be non-expansive
- be easy to place and compact
- be relatively unaffected by moisture content change
- be readily available at reasonable cost
- be uniform in composition so the same construction procedures will produce the same results

Material meeting the requirements for South Dakota Department of Transportation (S.D.D.O.T.) Limestone Ledge Rock, Base Course, as found in Section 882, Page 405 of the “Standard Specifications for Roads and Bridges” (1998) publication satisfies all of these and is specified for use as structural fill.

This material should be placed in lifts not exceeding 8 inches, and compacted to 95 percent of maximum Standard Proctor density. The base of the over excavation, and the walls of the excavation to at least the final surface of the structural fill (i.e. 18 inches below grade) should be lined with an 8-oz non-woven geotextile to prevent migration of fine particles and facilitate compaction. The geotextile may be extended over the edge of the excavation and trimmed flush later if construction is simpler that way. Vehicle traffic must not be allowed directly on the geotextile, and care must be taken when turning vehicles on the first lift of structural fill.

6.2. Slabs on Grade

Slabs for these structures will be concrete floors in the crawl spaces. The slabs will bear on compacted structural fill and may be designed using a modulus of subgrade reaction, “K” of 250 pci (without frost penetration). A vapor barrier overlying a six-inch capillary water barrier will be required beneath all floor slabs on grade.

6.3. Pavement Design

Soil underlying pavement is predominantly lean and fat clay. Based on site observations and photographs included in the Design Analysis, pavements in the area have provided relatively good service except for areas where later underground utility work has taken place and improper compaction of the subgrade was apparently performed. At those locations settling of the pavement and failure of the curb has occurred. The site soils have a frost design classification of F3.

If rigid pavement design does not consider frost penetration, a modulus of subgrade reaction "K" of 150 pci is recommended for design purposes. Flexible pavement designs should use a California Bearing Ratio (CBR) value of 5 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".

6.4. Settlement and Swell Potential

Based on an analysis of consolidation tests performed on material from representative samples and a simulated layer of compacted granular material, 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. The granular layer is not necessary from a settlement standpoint, however it is necessary to reduce the potential for movement caused by swelling of the subgrade.

6.5. 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. Foundations and slabs will also be isolated from the subgrade by the structural fill being placed. Based on criteria outlined in ACI 201.2, a low exposure condition exists and sulfate-resistant cement will not be required for concrete in contact with soil or groundwater.

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.

6.6. Corrosion Potential

Soil resistivity tests were performed on three representative samples from buried utility depth (approximately 5 to 6 feet). Test results indicated a resistivity of 1820, 1760 and 2220 ohm-cm, respectively. 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 8.0, 8.2 and 8.0, respectively.

6.7. Lateral Earth Pressure

Earth pressures on foundation walls will result from a combination of granular structural fill against the lower portion and cohesive soil against the upper portion. A unit weight of 130 pounds per cubic foot, and an angle of internal friction of 35 degrees may be used for the structural fill; a unit weight of 120 pounds per cubic foot, and an angle of internal friction of 15 degrees may be used for the overlying cohesive soil. The coefficient of friction against formed concrete is 0.35.

6.8. Foundation Drainage

A foundation drain consisting of 4 or 6-inch diameter perforated pipe surrounded by free-draining granular material is recommended. The drainage material should extend a minimum of two pipe diameters around the circumference and should be surrounded by an 8-oz. non-woven geotextile to prevent fines migration into the material. The perforated pipe itself should not be wrapped. Since the depth of over excavation is relatively shallow compared to the ground water table, the drain may be located at the base of the over excavation to aid in keeping the structural fill layer dry.

7. Construction Considerations

7.1. Cold Weather Fill Placement

If fill, including structural fill, will be placed in freezing weather, care must be taken to prevent the formation of ice lenses or frozen soil masses. In extreme cases placement may have to be suspended until the temperature increases in order for proper compaction of the material to be achieved. The project specifications should include prohibition of placing frozen materials.

7.2. Protection of Exposed Subgrade

Subgrades exposed during over excavation should be protected from moisture content change by placing backfill as soon as possible. Precipitation should be prevented from collecting on the surface as much as possible.

7.3. Questions During Construction

Questions regarding the intent of the provisions in this report, as well as any that arise during construction may be directed to Gordon Lewis, Soils A Section, Geotechnical Branch, CENWO-ED-GA, at email Gordon.G.Lewis@usace.army.mil or phone(402) 221-4306.

CENWO-ED-GA 18 April 2003

MEMORANDUM FOR CENWO-PM-M (Stobbe)

SUBJECT: Final Foundation Analysis for the Replace Family Housing Phase 3 Project at Ellsworth Air Force Base, South Dakota

1. Enclosed is the Final Foundation Analysis for the design of the Replace Family Housing Phase 3 project at Ellsworth AFB, South Dakota.

2. Questions regarding this report may be directed to Gordon Lewis, CENWO-ED-GA, (402) 221-4306.

Encl
as

JOHN W. MONZINGO, P.E.
Chief, Geotechnical Engineering
and Sciences Branch

Lewis/ggl/4306

Wagner/CENWO-ED-GG

Skeen/CENWO-ED-GG

Ray/CENWO-ED-GA

Monzingo/CENWO-ED-G

CENWO-ED-GA 18 April 2003

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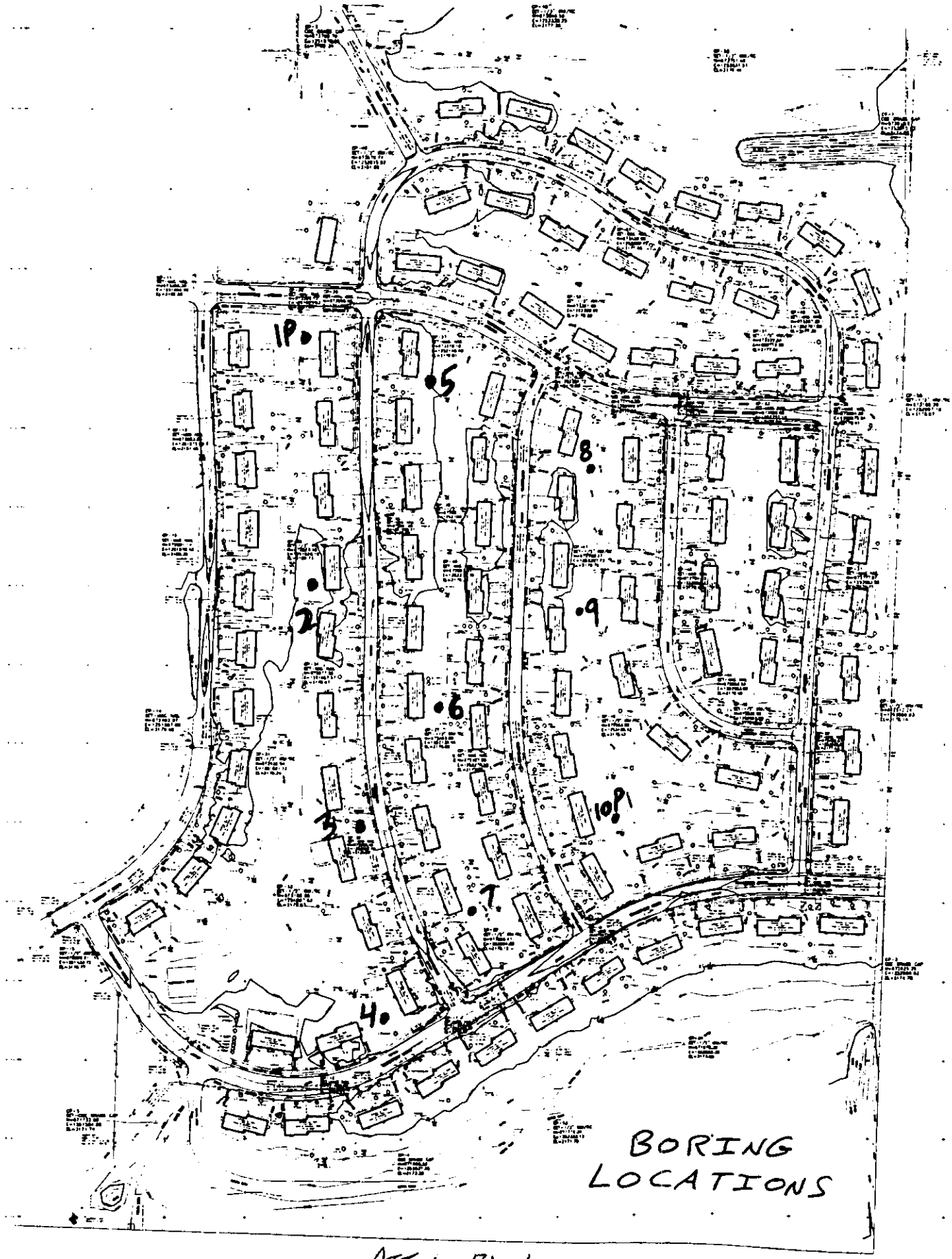
JOHN W. MONZINGO, P.E.
Chief, Geotechnical Engineering
and Sciences Branch

CF: CENWO-ED-DF (Harris)
CENWO-CD-BH (Mailander)



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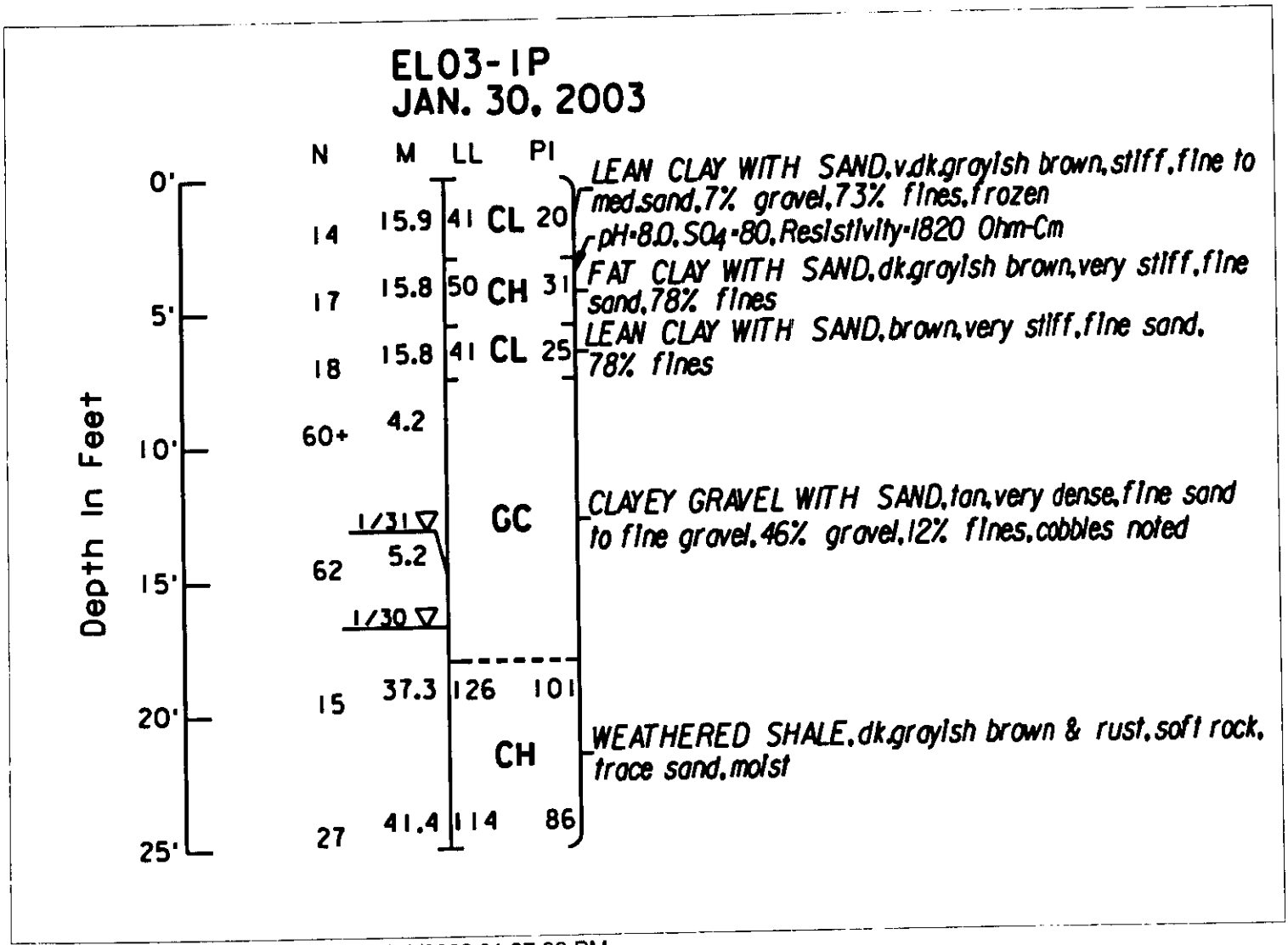

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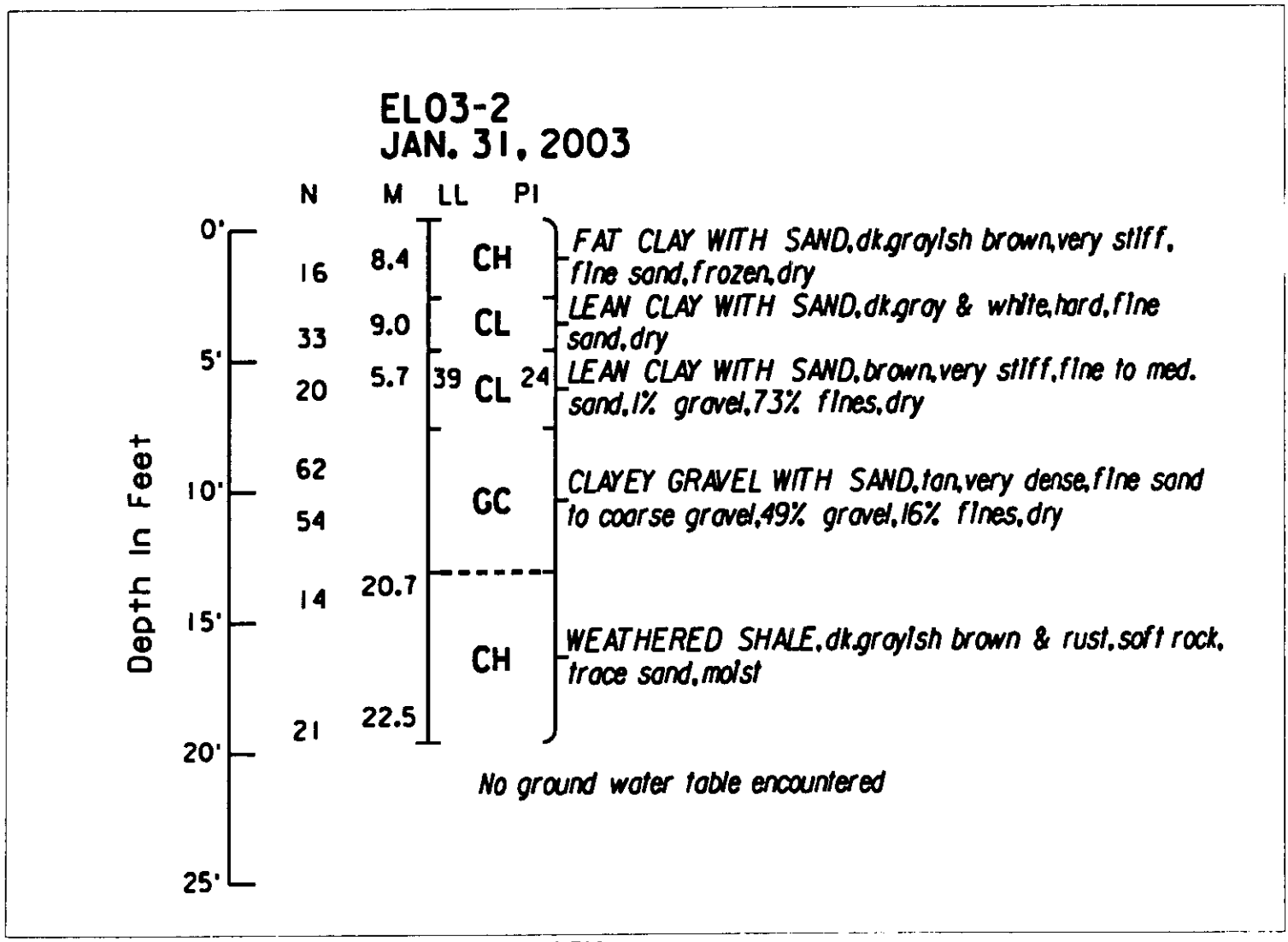

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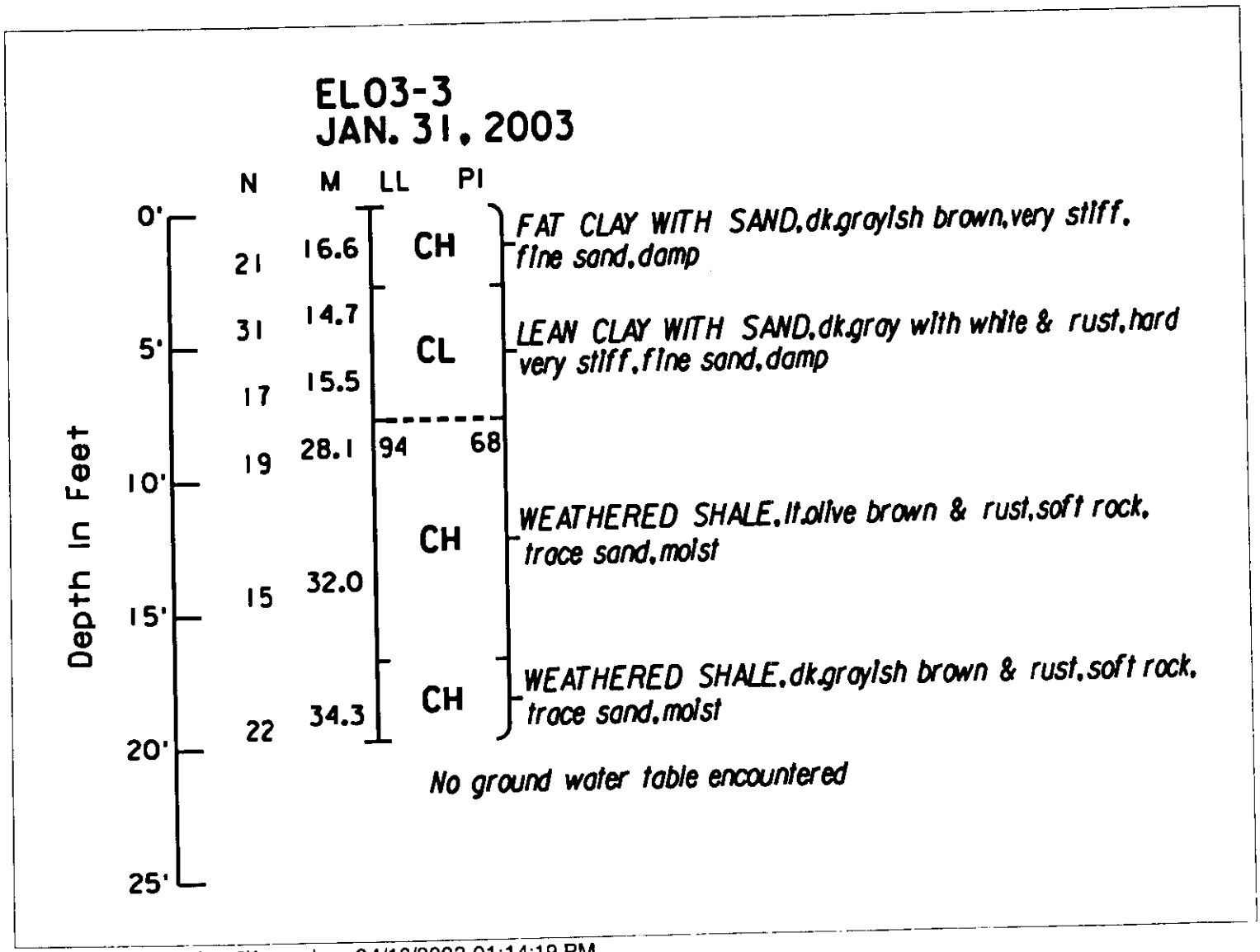

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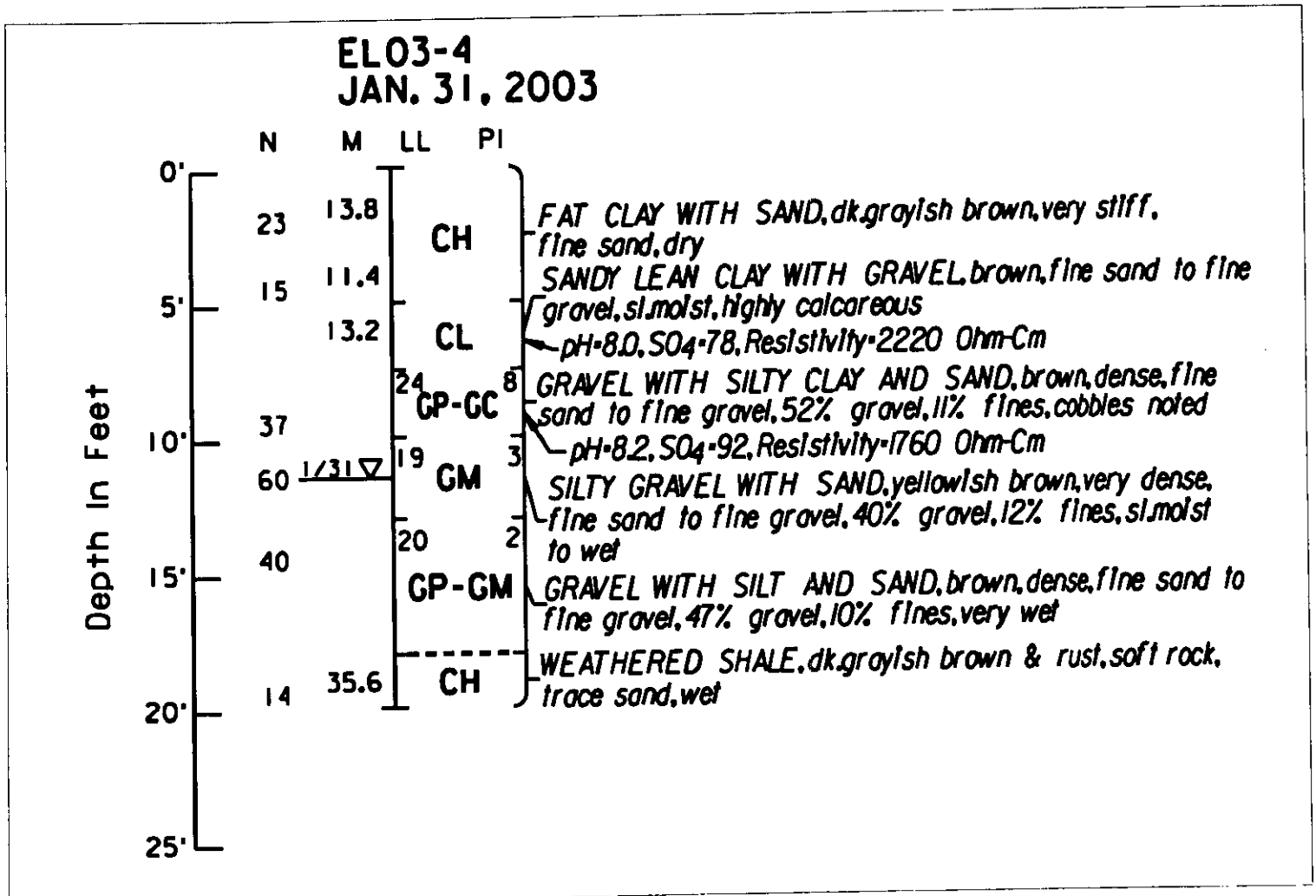

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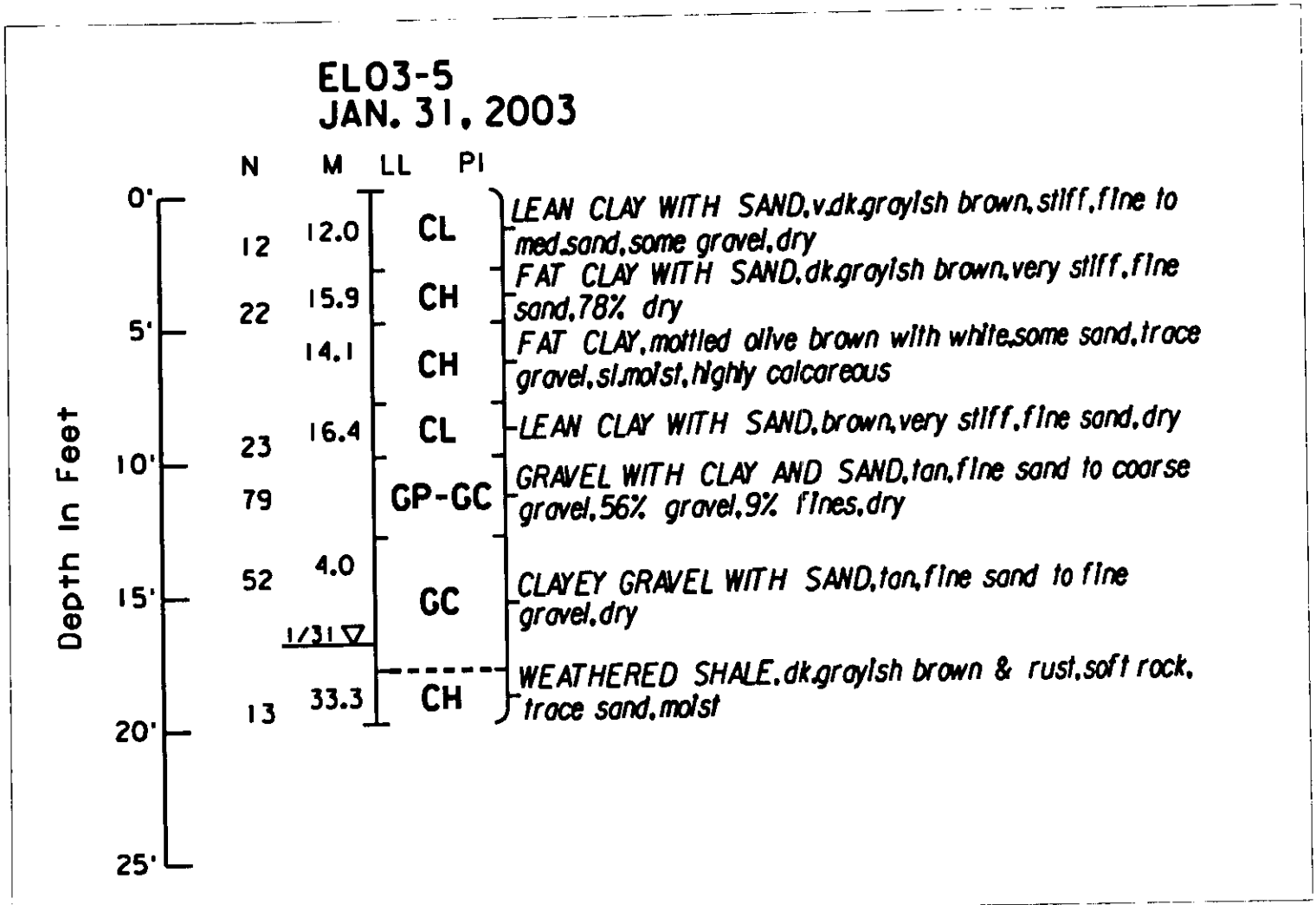

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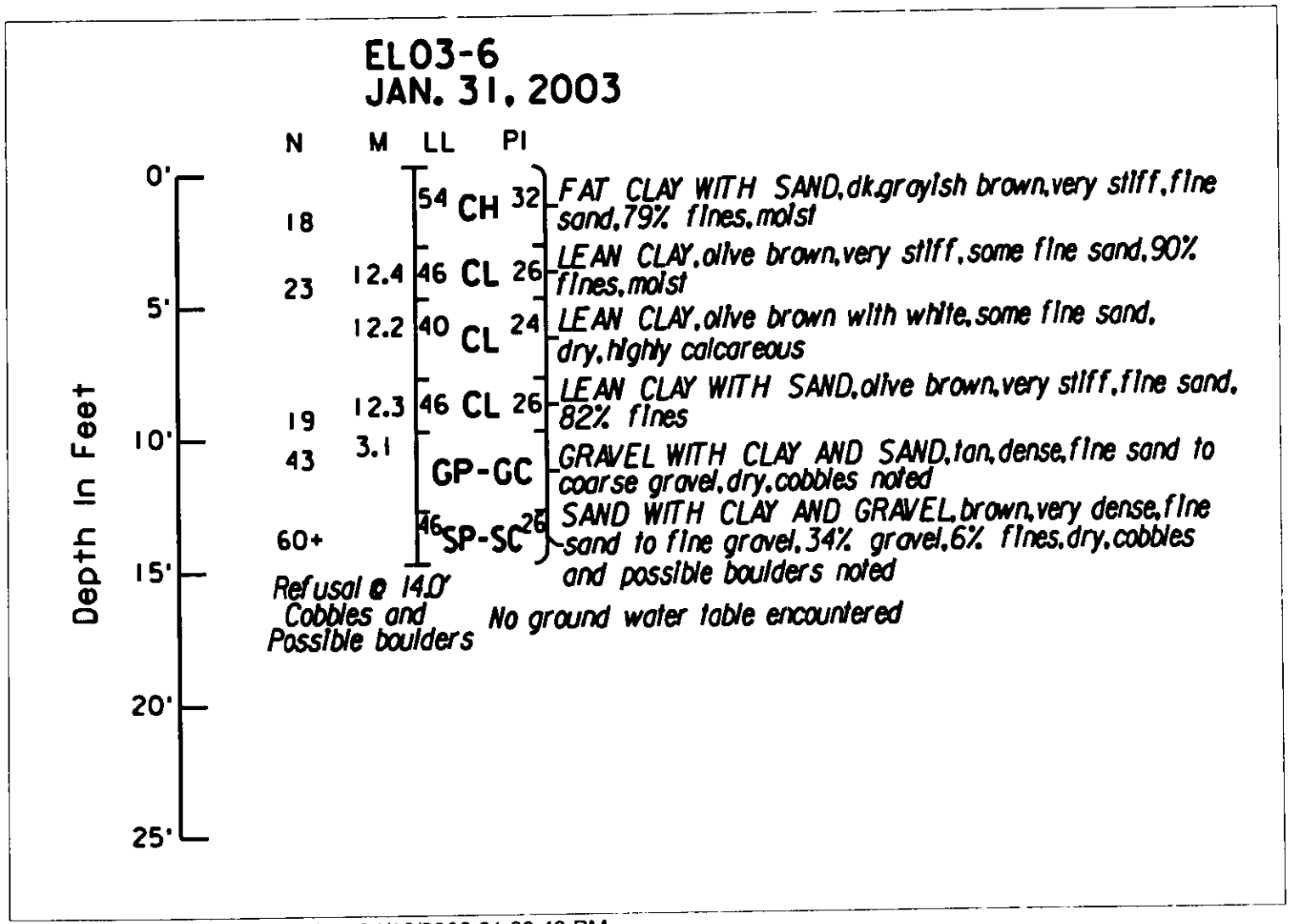

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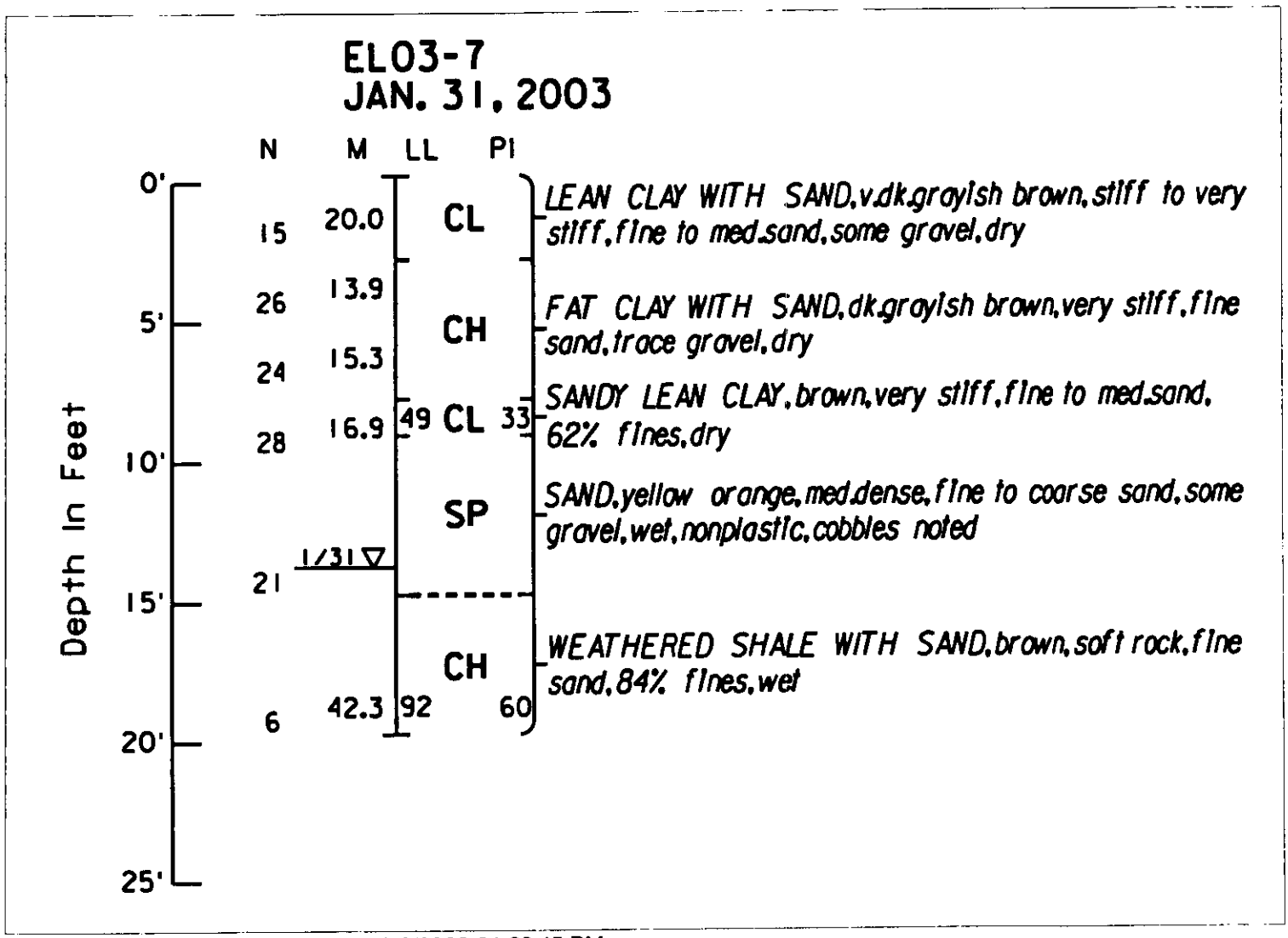

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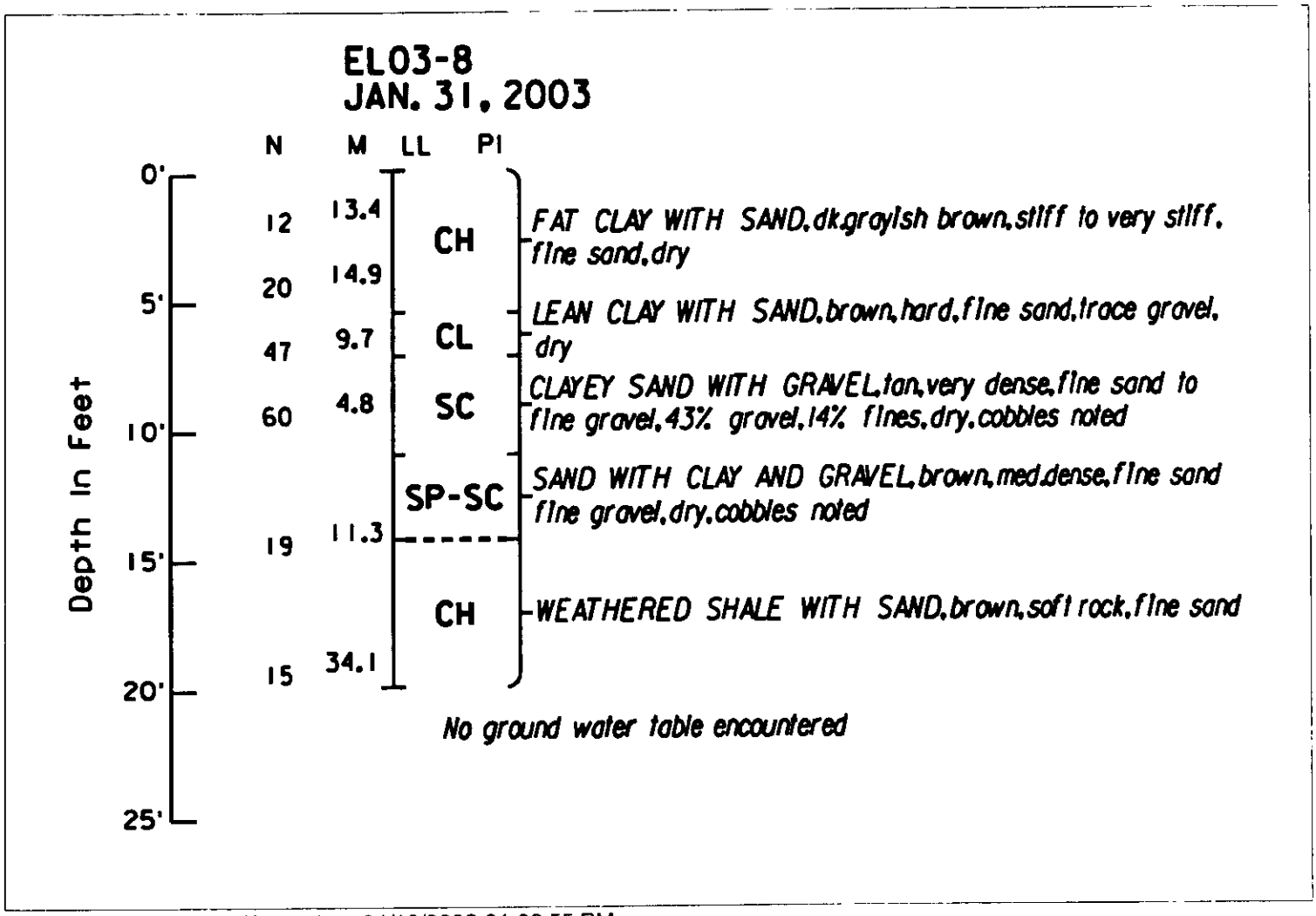

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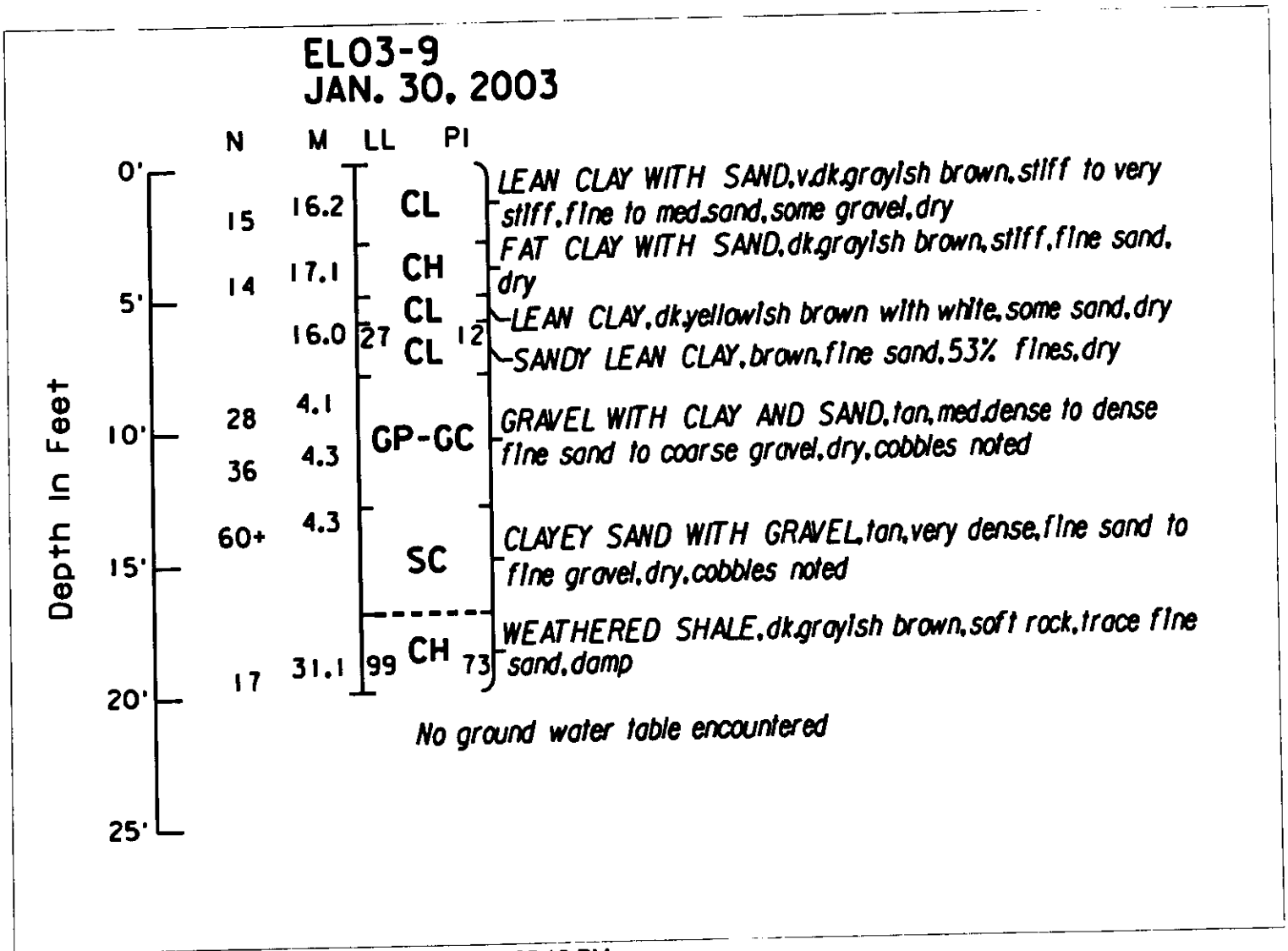

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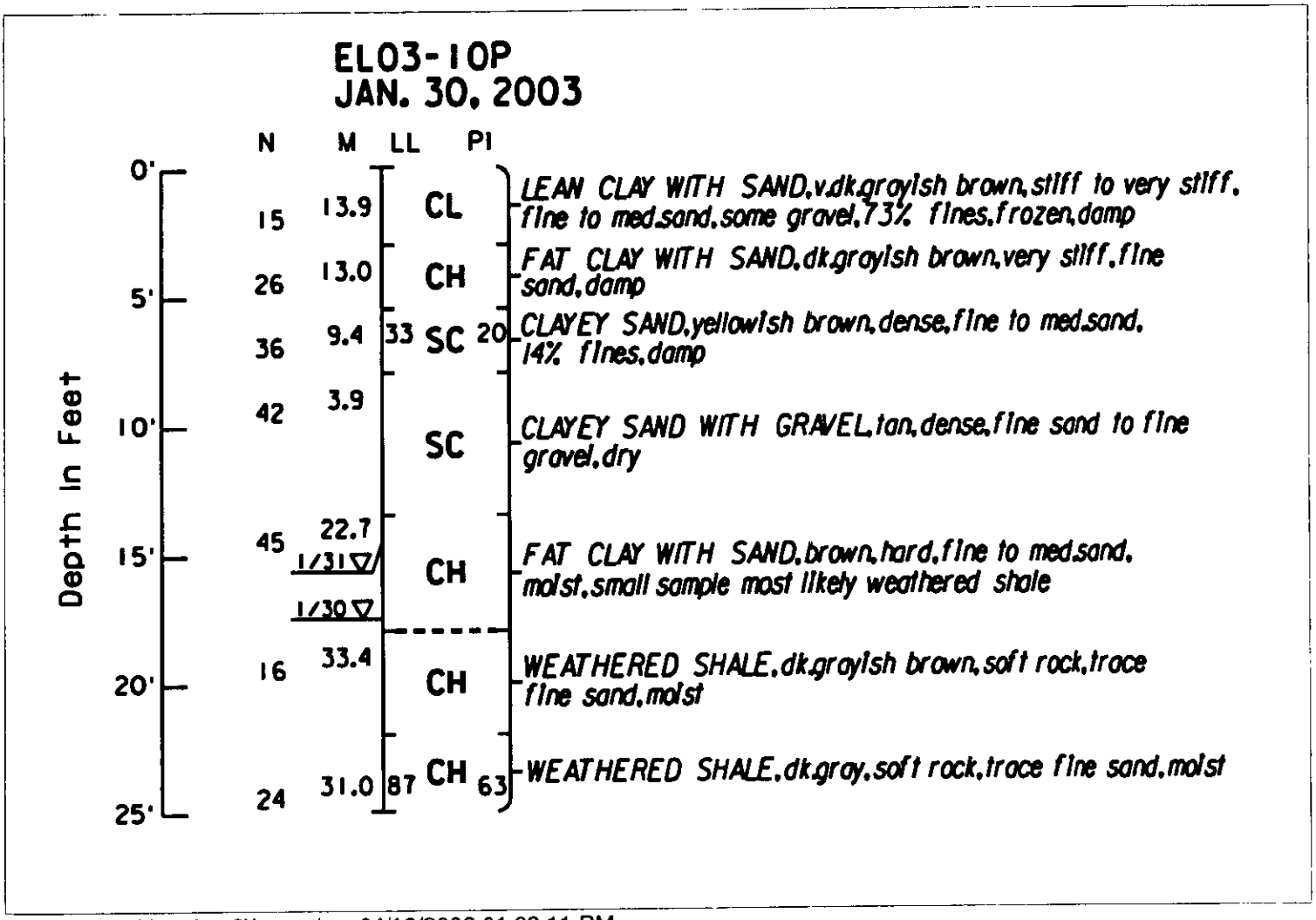

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ATTACHMENT NO. 2

ELLSWORTH AFB ASBESTOS AND LEAD-BASED PAINT IDENTIFICATION SURVEY

SEE ADVERTISED CD-ROM (AS_LBP SURVEY.PDF) FOR FULL TEXT DOCUMENT

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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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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 (CEGS)
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
11215A 06/01 FANS/BLOWERS/PUMPS; OFF-GAS
11220A 01/03 PRECIPITATION/COAGULATION/FLOCCULATION WATER TREATMENT
11225A 06/01 DOWNFLOW LIQUID ACTIVATED CARBON ADSORPTION UNITS
11226A 04/98 VAPOR PHASE ACTIVATED CARBON ADSORPTION UNITS
11241A 12/88 CHLORINE-FEEDING MACHINES (AUTOMATIC, SEMIAUTOMATIC AND MANUAL)
11242A 12/01 CHEMICAL FEED SYSTEMS
11243A 04/99 CHEMICAL TREATMENT OF WATER FOR MECHANICAL SYSTEMS
11250A 11/01 WATER SOFTENERS, CATION-EXCHANGE (SODIUM CYCLE)
11285A 01/94 MITER GATES
11286A 01/94 SECTOR GATES
11287A 01/94 TAINTER GATES AND ANCHORAGES
11288A 07/93 VERTICAL LIFT GATES

11289A 04/93 CLOSURE GATES
11301A 04/99 AIR STRIPPER
11310A 11/90 PUMPS; SEWAGE AND SLUDGE
11311 02/02 PARALLEL PLATE [OR VERTICAL TUBE], GRAVITY OIL-WATER SEPARATOR
11312A 04/98 SIPHONS, DOSING
11312N 01/01 PACKAGE [GRINDER PUMP][LIFT] STATION
11313A 04/01 PNEUMATIC SEWAGE EJECTORS
11320N 08/01 GRIT COLLECTING EQUIPMENT
11330A 04/89 SEWAGE BAR SCREEN AND MECHANICAL SHREDDER
11331N 08/01 COMMINUTOR
11334A 01/89 COMMINUTOR
11338N 08/01 CIRCULAR CLARIFIER
11350A 07/01 SLUDGE-COLLECTING EQUIPMENT
11360A 06/01 RECESSED CHAMBER FILTER PRESS SYSTEM
11365A 06/90 TRICKLING FILTER
11375A 11/01 AIR SUPPLY AND DIFFUSION EQUIPMENT FOR SEWAGE TREATMENT
11375N 08/01 AERATION EQUIPMENT
11376 03/93 ULTRAVIOLET DISINFECTION EQUIPMENT
11377 06/01 ADVANCED OXIDATION PROCESSES (AOP)
11378 10/01 THERMAL (CATALYTIC) OXIDATION SYSTEMS
11380 12/89 SLUDGE-DIGESTER GAS, HEATING, AND MIXING SYSTEM
11390 08/01 PREFABRICATED BIOCHEMICAL WASTEWATER TREATMENT PLANT
11391 08/01 CONTINUOUS LOOP REACTOR WASTEWATER TREATMENT SYSTEM
11393 06/01 FILTRATION SYSTEM
11400A 01/02 FOOD SERVICE EQUIPMENT
11400N 09/99 FOOD SERVICE EQUIPMENT
11401N 08/01 ELECTRIC KITCHEN EQUIPMENT
11475 08/01 RADIOGRAPHIC DARKROOM EQUIPMENT
11500A 05/01 AIR POLLUTION CONTROL
11601N 08/01 LABORATORY EQUIPMENT AND FUMEHOODS
11613N 08/01 STILLS AND ASSOCIATED EQUIPMENT
11700N 08/01 GENERAL REQUIREMENTS FOR MEDICAL AND DENTAL EQUIPMENT
11702N 08/01 MEDICAL EQUIPMENT, MISCELLANEOUS
11704N 09/99 [CASEWORK] [AND] [MATERIAL HANDLING UNITS] IN MEDICAL FACILITIES
11706N 09/99 HYDROTHERAPY EQUIPMENT
11707N 08/01 HOSPITAL AND LABORATORY WASHING EQUIPMENT
11708N 09/99 INSTALLATION OF GOVERNMENT-FURNISHED MEDICAL EQUIPMENT
11710A 07/01 WARMING CABINETS, STERILIZERS, AND ASSOCIATED EQUIPMENT
11712N 08/01 STERILIZERS AND ASSOCIATED EQUIPMENT
11744N 09/99 DENTAL EQUIPMENT

DIVISION 12 - FURNISHINGS
(UFGS UNLESS DESIGNATED OTHERWISE)

12301N 09/99 MANUFACTURED VANITIES
12320A 05/98 CABINETS AND COUNTERTOPS
12350A 04/99 CASEWORK FOR MEDICAL AND DENTAL FACILITIES
12351N 03/01 MEDICAL AND DENTAL CASEWORK
12352N 09/99 RESIDENTIAL CASEWORK
12490A 01/98 WINDOW TREATMENT
12490N 09/99 BLINDS, VENETIAN (AND AUDIO VISUAL)
12491N 08/01 CURTAINS AND DRAPES
12600A 03/02 THEATER CHAIRS

12601N 09/99 THEATER SEATING
12705 06/01 FURNITURE SYSTEMS

DIVISION 13 - SPECIAL CONSTRUCTION
(UFGS UNLESS DESIGNATED OTHERWISE)

13034N 08/01 PREFABRICATED AUDIOMETRIC ROOMS
13038 08/01 COLD-STORAGE ROOMS (PREFABRICATED PANEL TYPE)
13080 04/99 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT
13090A 01/94 X-RAY SHIELDING
13092N 09/99 X-RAY SHIELDING
13093N 12/01 RADIO FREQUENCY SHIELDED ENCLOSURES, DEMOUNTABLE TYPE
13094N 12/01 RADIO FREQUENCY SHIELDED ENCLOSURES, WELDED TYPE
13095A 07/01 ELECTROMAGNETIC (EM) SHIELDING
13095N 09/99 HEMP SHIELDED DOOR
13100A 07/01 LIGHTNING PROTECTION SYSTEM
13100N 09/99 LIGHTNING PROTECTION SYSTEM
13110A 11/98 CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE)
13110N 09/00 CATHODIC PROTECTION BY GALVANIC ANODES
13111A 11/98 CATHODIC PROTECTION SYSTEM (STEEL WATER TANKS)
13111N 08/01 CATHODIC PROTECTION BY IMPRESSED CURRENT
13112A 11/98 CATHODIC PROTECTION SYSTEM (IMPRESSED CURRENT)
13112N 03/00 CATHODIC PROTECTION SYSTEM (STEEL WATER TANKS)
13113A 09/01 CATHODIC PROTECTION SYSTEMS (IMPRESSED CURRENT)FOR LOCK MITER GATES
13120A 01/02 STANDARD METAL BUILDING SYSTEMS
13121A 01/02 METAL BUILDING SYSTEMS (MINOR REQUIREMENTS)
13121N 08/01 PREENGINEERED METAL BUILDINGS
13202A 07/02 FUEL STORAGE SYSTEMS
13203A 08/93 TIGHTNESS TESTING OF UNDERGROUND FUEL SYSTEMS
13205N 06/02 STEEL TANKS WITH FIXED ROOFS
13206A 02/02 STEEL STANDPIPES AND GROUND STORAGE RESERVOIRS
13208N 09/99 WIRE-WOUND CIRCULAR PRESTRESSED-CONCRETE WATER TANK
13209N 09/00 WATER STORAGE TANKS
13210A 02/02 ELEVATED STEEL WATER TANK
13210N 2/02 ABOVEGROUND FUEL OIL STORAGE TANKS
13211A 07/89 PRESSURE VESSELS FOR STORAGE OF COMPRESSED GASES
13216N 09/99 UNDERGROUND PETROLEUM TANKS
13217N 09/99 FIBERGLASS-PLASTIC LINING FOR STEEL TANK BOTTOMS (FOR PETROLEUM)
13219N 09/99 CLEANING PETROLEUM STORAGE TANKS
13234A 04/01 FLOATING COVER FOR SLUDGE-DIGESTION TANKS
13280A 11/01 ASBESTOS ABATEMENT
13281A 03/02 LEAD HAZARD CONTROL ACTIVITIES
13281N 01/02 ENGINEERING CONTROL OF ASBESTOS CONTAINING MATERIALS
13282N 02/02 LEAD IN CONSTRUCTION
13283N 02/02 REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD
13284N 09/99 REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBs)
13285N 09/99 REMOVAL AND DISPOSAL OF PCB CONTAMINATED SOILS
13286N 01/01 HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBs AND MERCURY
13287N 09/99 RADON MITIGATION
13290A 03/89 COMPOSTING TOILET
13401N 09/99 FLOW MEASURING EQUIPMENT [POTABLE WATER] [SEWAGE TREATMENT PLANT]

13405A 01/03 PROCESS CONTROL
13420A 11/97 SELF-ACTING BLAST VALVES
13451A 06/02 POWER MONITORING SYSTEM
13600A 08/01 SOLAR WATER HEATING EQUIPMENT
13610N 09/99 SOLAR LIQUID FLAT PLATE COLLECTORS
13702N 09/99 BASIC INTRUSION DETECTION SYSTEMS (IDS)
13703N 09/99 COMMERCIAL INTRUSION DETECTION SYSTEMS (IDS)
13720A 05/98 ELECTRONIC SECURITY SYSTEM
13721A 03/97 SMALL INTRUSION DETECTION SYSTEM
13798 09/99 DURESS SIGNAL SYSTEM [FOR BRIG FACILITIES]
13799 09/99 WATCHTOUR SYSTEM [FOR BRIG FACILITIES]
13801A 12/01 UTILITY MONITORING AND CONTROL SYSTEM (UMCS)
13814A 04/89 BUILDING PREPARATION FOR ENERGY MONITORING AND CONTROL SYSTEMS (EMCS)
13820A 04/01 MULTI-BUILDING EXPANSION OF ENERGY MONITORING AND CONTROL SYSTEMS
13850A 02/02 FIRE DETECTION AND ALARM SYSTEM, DIRECT CURRENT LOOP
13851A 02/02 FIRE DETECTION AND ALARM SYSTEM, ADDRESSABLE
13851N 09/99 EXTERIOR FIRE ALARM SYSTEM, CLOSED CIRCUIT TELEGRAPHIC TYPE
13852A 11/97 FIRE ALARM REPORTING SYSTEM, RADIO TYPE
13852N 09/99 INTERIOR FIRE DETECTION AND ALARM SYSTEM
13853A 11/97 CENTRAL FIRE ALARM SYSTEM, DIGITAL ALARM COMMUNICATOR TYPE
13853N 09/99 FIRE ALARM SYSTEM, RADIO TYPE
13854N 08/00 FIRE ALARM REPORTING SYSTEMS - DIGITAL COMMUNICATORS
13855N 03/00 ANALOG/ADDRESSABLE INTERIOR FIRE ALARM SYSTEM
13856N 04/02 CARBON MONOXIDE DETECTORS
13920A 12/01 FIRE PUMPS
13920N 09/99 FIRE PUMPS
13930A 12/02 WET PIPE SPRINKLER SYSTEM, FIRE PROTECTION
13930N 09/99 WET-PIPE FIRE SUPPRESSION SPRINKLERS
13931N 09/99 FIRE EXTINGUISHING SPRINKLER SYSTEMS (RESIDENTIAL)
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SECTION 01356

STORM WATER POLLUTION PREVENTION MEASURES

11/01

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 015__ NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES.] [The Contractor shall install and maintain stabilization and structural best management practices which will minimize erosion and sediment pollution from the construction site to the extent attainable. The Contractor shall be responsible for selection of appropriate best management practices as specified herein.]

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 015__ NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION

SITES][below].

1.4.1 Stabilization Practices

The stabilization practices to be implemented may include temporary seeding, mulching, sod stabilization, vegetative buffer strips, erosion control blankets, [protection of trees,] preservation of mature vegetation, etc. On his daily CQC Report, the Contractor shall record the dates when the major grading activities occur; when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated.

1.4.1.1 Permanent Seeding

Disturbed areas of the site where construction activities permanently ceases shall be stabilized with permanent seeding no more than 14 days after the construction activity ceases, except as follows. When the initiation of permanent seeding is stopped due to snow cover or arid conditions, permanent seeding shall be initiated as soon as practicable.

1.4.1.2 Temporary Seeding and Mulching

Areas where construction activities will temporarily cease for more than one year shall be temporarily seeded and mulched. Disturbed areas of the site where construction activities temporarily cease for more than 21 days and less than one year shall be stabilized with either temporary seeding and mulching or mulching not more than 14 days after construction activity ceases, except as follows. When the initiation of temporary stabilization measures is stopped due to snow cover or arid conditions, stabilization measures shall be initiated as soon as practicable.

1.4.1.3 Erosion Control Blankets

Erosion control blanket may be installed on steep slopes and in drainage swales and ditches to protect finished grades from erosion.

1.4.2 Temporary Structural Practices

Temporary structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. Temporary structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Temporary structural practices shall include but not be limited to the following devices. [Location and details of installation and construction are shown on the drawings.]

1.4.2.1 Silt Fences

The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading). Silt fence barriers shall be installed along the down slope boundary of all disturbed areas prior to begining land-distrubing activities in those areas. Silt fence barriers may be installed across ditches or swales but not where the drainage area is greater than 1 acre. Removal of silt fence barriers shall be approved by the Contracting Officer.

1.4.2.2 Storm Drain Inlet Protection

Storm drain inlet protection shall be installed at each new and existing inlet which receives storm runoff from disturbed areas of 1 acre of less. The protection at each inlet shall be removed once the disturbed area has been finally stabilized.

1.4.2.3 Culvert Inlet Protection

Culvert inlet protection shall be installed at all culverts with a drainage area of 1 acre or less.

1.4.2.4 Rock Check Dams

Rock check dams may be used to reduce erosion of temporary or permanent ditches or swales. Type 1 rock check dams shall be used when the upstream drainage area is less than 2 acres. Type 2 rock check dams shall be used when the upstream area is 2 to 10 acres.

1.4.2.5 Stone Construction Entrance

A stone construction entrance shall be constructed wherever traffic will be leaving the construction site and move directly onto a paved road. Stone construction entrances shall be removed after the site has been finally stabilized.

1.4.2.6 Sediment Trap

Sediment traps may be constructed below disturbed areas where the total contributing drainage area is less than 3 acres. Sediment traps, when used, should be constructed prior to disturbance of upslope areas. Sediment traps must have an initial storage volume of 134 cubic yards per acre of drainage area, half of which shall be in the form of a permanent pool or wet storage to provide a stable settling medium. The remaining half shall be in the form of a drawdown or dry storage which will provide extended settling time during less frequent, larger storm events.

1.4.2.7 Diversion Dikes

Diversion dikes may be constructed to divert runoff from upslope drainage areas away from unprotected disturbed areas and slopes to a stabiilized outlet or to divert sediment-laden runoff from a disturbed area to a sediment-trapping facility such as a sediment trap or sediment basin. Diversion dikes shall have a maximum channel slope of 2 percent and shall be adequately compacted to prevent failure. The minimum height measured from the top of the dike to the bottom of the channel shall be 18 inches. The minimum base width shall be 6 feet and the minimum top width shall be 2 feet. The Contractor shall ensure that the diversion dikes are not damaged by construction operations or traffic.

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.] [The following procedures shall be followed to maintain the protective measures.]

3.4.1 Silt Fences

Silt fences shall be inspected in accordance with paragraph INSPECTIONS. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with Section 02921 SEEDING.

3.4.2 Storm Drain Inlet Protection

Inlet protection structures shall be inspected after each rainfall and repairs made as needed. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design depth.

3.4.3 Rock Check Dams

Check dams should be checked for sediment after each runoff-producing sotrm event. Sediment should be removed when it reaches one half the original height of the measure.

3.4.4 Stone Construction Entrance

Stone construction entrances shall be maintained in a conditon which will prevent tracking or flow of mud onto paved roads. This may require periodic top dressing with additional stone or the washing and reworking of existing stone as conditions demand and repair and/or cleanout of any structures used to trap sediment. The use of water trucks to remove materials dropped, washed, or tracked onto roadways will not be permitted under any circumstances.

3.4.5 Sediment Traps

Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design volume of the wet storage. Filter stone shall be regularly checked to ensure that filtration performance is maintained. Stone choked with sediment shall be removed and cleaned or replaced. The structure should be inspected regularly to ensure that it is structurally sound and has not been damaged by erosion or construction equipement. The height of the stone outlet should be inspected to ensure that its center is a least 1 foot below the top of the embankment.

3.4.6 Diversion Dikes

Diversion dikes shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damaged diversion dikes and necessary repairs shall be accomplished promptly. When diversion dikes are no longer required, they shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with Section 02921 SEEDING.

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.]

3.5.2 Inspections Details

Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.

3.5.3 Inspection Reports

For each inspection conducted, the Contractor shall prepare a report summarizing the scope of the inspection, name(s) of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention measures, maintenance performed, and actions taken. The report shall be furnished to the Contracting Officer within 24 hours of the inspection as a part of the Contractor's daily CQC REPORT.

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SECTION 02300A

EARTHWORK

12/97

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SECTION 02300A

EARTHWORK
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN 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.

-- End of Section --

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DIVISION 02 - SITE WORK

SECTION 02316A

EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS

05/02

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SECTION 02316A

EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS
05/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 1556	(1990; R 1996) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(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	(1996) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(1988; R1996el) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

1.2 MEASUREMENT AND PAYMENT

Measurement and payment shall be based on completed work performed in accordance with the drawings and specifications.

1.2.1 Trench Excavation

Trench excavation shall be the number of linear feet measured along the centerline of the trench and excavated to the depths and widths specified for the particular size of pipe. No increase shall be made for the extra width required at manholes and similar structures. Payment for trench excavation, as so measured, shall constitute full payment for excavation and backfilling, [including specified overdepth] except in rock or unstable trench bottoms. Unstable trench bottoms shall be replaced by select granular material and paid for as specified below. Trench excavation shall also include the additional width at manholes and similar structures, the furnishing, placing and removal of sheeting and bracing, pumping and bailing, and all incidentals necessary to complete the work required by

this section.

1.2.2 Rock Excavation

Rock excavation shall be measured and paid for by the number of cubic yards of acceptably excavated rock material. The material shall be measured in place, but volume shall be based on a maximum 30 inch width for pipes 12 inches in diameter or less, and a maximum width of 16 inches greater than the outside diameter of the pipe for pipes over 12 inches in diameter. The measurement shall include all authorized overdepth rock excavation as determined by the Contracting Officer. For manholes and other appurtenances, volumes of rock excavation shall be computed on the basis of 1 foot outside of the wall lines of the structures. Payment for rock excavation will be made in addition to the price bid for the trench excavation, and will include all necessary drilling and blasting and all incidentals necessary to excavate and dispose of the rock. Backfill replacing rock excavation will not be paid for separately, but will be included in the unit price for rock excavation.

1.2.3 Sheeting and Bracing

Sheeting and bracing, when shown or authorized by the Contracting Officer to be left in place, will be paid for as follows: [_____].

1.2.3.1 Timber Sheeting

Timber sheeting will be paid for as the number of board feet of lumber below finish grade measured in place prior to backfilling. Sheeting wasted when cut off between the finished grade and 1 foot below the finished grade also shall be included in the measurement.

1.2.3.2 Steel Sheeting and Soldier Piles

Steel sheeting, soldier piles, and steel bracing will be paid for according to the number of pounds of steel calculated. This calculation shall be made by multiplying the measured in-place length in feet below finish grade by the unit weight of the section in pounds per foot. Unit weight of rolled steel sections shall be obtained from recognized steel manuals. [Sheeting wasted when cut off between the finished grade and a distance of up to [_____] feet below the finished grade shall be included in the measurement.]

1.2.4 Select Granular Material

Select granular material shall be measured in place as the actual cubic yards replacing wet or unstable material in trench bottoms [within the limits shown] [in authorized overdepth areas]. The unit price shall include furnishing and placing the granular material, excavation and disposal of unsatisfactory material, and additional requirements for sheeting and bracing, pumping, bailing, cleaning, and other incidentals necessary to complete the work. Payment for select granular material will be made in addition to the bid price for trench excavation.

1.3 DEGREE OF COMPACTION

Degree of compaction shall be expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-06 Test Reports

Field Density Tests; [_____], [_____]
Testing of Backfill Materials; [_____], [_____]

Copies of all laboratory and field test reports within 24 hours of the completion of the test.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 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].

2.1.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Unsatisfactory materials also include man-made fills, trash, refuse, or backfills from previous construction. Unsatisfactory material also includes material classified as satisfactory which contains root and other organic matter, frozen material, and stones larger than [_____] inches. The Contracting Officer shall be notified of any contaminated materials.

2.1.3 Cohesionless and Cohesive Materials

Cohesionless materials shall include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials shall include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM shall be identified as cohesionless only when the fines are nonplastic.

2.1.4 Rock

Rock shall consist of boulders measuring 1/2 cubic yard or more and materials that cannot be removed without systematic drilling and blasting such as rock material in ledges, bedded deposits, unstratified masses and conglomerate deposits, and below ground concrete or masonry structures, exceeding 1/2 cubic yard in volume, except that pavements shall not be considered as rock.

2.1.5 Unyielding Material

Unyielding material shall consist of rock and gravelly soils with stones greater than [_____] inches in any dimension or as defined by the pipe manufacturer, whichever is smaller.

2.1.6 Unstable Material

Unstable material shall consist of materials too wet to properly support the utility pipe, conduit, or appurtenant structure.

2.1.7 Select Granular Material

Select granular material shall consist of well-graded sand, gravel, crushed gravel, crushed stone or crushed slag composed of hard, tough and durable particles, and shall contain not more than 10 percent by weight of material passing a No. 200 mesh sieve and no less than 95 percent by weight passing the l inch sieve. The maximum allowable aggregate size shall be [_____] inches, or the maximum size recommended by the pipe manufacturer, whichever is smaller.

2.1.8 Initial Backfill Material

Initial backfill shall consist of select granular material or satisfactory materials free from rocks [_____] inches or larger in any dimension or free from rocks of such size as recommended by the pipe manufacturer, whichever is smaller. When the pipe is coated or wrapped for corrosion protection, the initial backfill material shall be free of stones larger than [_____] inches in any dimension or as recommended by the pipe manufacturer, whichever is smaller.

2.2 PLASTIC MARKING TAPE

Plastic marking tape shall be acid and alkali-resistant polyethylene film, 6 inches wide with minimum thickness of 0.004 inch. Tape shall have a minimum strength of 1750 psi lengthwise and 1500 psi crosswise. The tape shall be manufactured with integral wires, foil backing or other means to enable detection by a metal detector when the tape is buried up to 3 feet deep. The tape shall be of a type specifically manufactured for marking and locating underground utilities. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. Tape color shall be as specified in TABLE 1 and shall bear a continuous printed inscription describing the specific utility.

TABLE 1. Tape Color

Red:	Electric
Yellow:	Gas, Oil, Dangerous Materials
Orange:	Telephone, Telegraph, Television, Police, and Fire Communications
Blue:	Water Systems
Green:	Sewer Systems

2.3 Detection Wire For Non-Metalic Piping

Detection wire shall be insulated single strand, solid copper with a minimum diameter of 12 AWG.

PART 3 EXECUTION

3.1 EXCAVATION

Excavation shall be performed to the lines and grades indicated. Rock excavation shall include removal and disposition of material defined as rock in paragraph MATERIALS. Earth excavation shall include removal and disposal of material not classified as rock excavation. During excavation, material satisfactory for backfilling shall be stockpiled in an orderly

manner at a distance from the banks of the trench equal to 1/2 the depth of the excavation, but in no instance closer than 2 feet. Excavated material not required or not satisfactory for backfill shall be removed from the site [or shall be disposed of by [_____]]. Grading shall be done as may be necessary to prevent surface water from flowing into the excavation, and any water accumulating shall be removed to maintain the stability of the bottom and sides of the excavation. Unauthorized overexcavation shall be backfilled in accordance with paragraph BACKFILLING AND COMPACTION at no additional cost to the Government.

3.1.1 Trench Excavation Requirements

The trench shall be excavated as recommended by the manufacturer of the pipe to be installed. Trench walls below the top of the pipe shall be sloped, or made vertical, and of such width as recommended in the manufacturer's installation manual. Where no manufacturer's installation manual is available, trench walls shall be made vertical. Trench walls more than [_____] feet high shall be shored, cut back to a stable slope, or provided with equivalent means of protection for employees who may be exposed to moving ground or cave in. Vertical trench walls more than [_____] feet high shall be shored. Trench walls which are cut back shall be excavated to at least the angle of repose of the soil. Special attention shall be given to slopes which may be adversely affected by weather or moisture content. The trench width below the top of pipe shall not exceed 24 inches plus pipe outside diameter (O.D.) for pipes of less than 24 inches inside diameter and shall not exceed 36 inches plus pipe outside diameter for sizes larger than 24 inches inside diameter. Where recommended trench widths are exceeded, redesign, stronger pipe, or special installation procedures shall be utilized by the Contractor. The cost of redesign, stronger pipe, or special installation procedures shall be borne by the Contractor without any additional cost to the Government.

3.1.1.1 Bottom Preparation

The bottoms of trenches shall be accurately graded to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Bell holes shall be excavated to the necessary size at each joint or coupling to eliminate point bearing. Stones of [_____] inches or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, shall be removed to avoid point bearing.

3.1.1.2 Removal of Unyielding Material

Where [overdepth is not indicated and] unyielding material is encountered in the bottom of the trench, such material shall be removed [_____] inches below the required grade and replaced with suitable materials as provided in paragraph BACKFILLING AND COMPACTION.

3.1.1.3 Removal of Unstable Material

Where unstable material is encountered in the bottom of the trench, such material shall be removed to the depth directed and replaced to the proper grade with select granular material as provided in paragraph BACKFILLING AND COMPACTION. When removal of unstable material is required due to the Contractor's fault or neglect in performing the work, the resulting material shall be excavated and replaced by the Contractor without additional cost to the Government.

3.1.1.4 Excavation for Appurtenances

Excavation for manholes, catch-basins, inlets, or similar structures shall be [sufficient to leave at least 12 inches clear between the outer structure surfaces and the face of the excavation or support members] [of sufficient size to permit the placement and removal of forms for the full length and width of structure footings and foundations as shown.] Rock shall be cleaned of loose debris and cut to a firm surface either level, stepped, or serrated, as shown or as directed. Loose disintegrated rock and thin strata shall be removed. Removal of unstable material shall be as specified above. When concrete or masonry is to be placed in an excavated area, special care shall be taken not to disturb the bottom of the excavation. Excavation to the final grade level shall not be made until just before the concrete or masonry is to be placed.

3.1.1.5 Jacking, Boring, and Tunneling

Unless otherwise indicated, excavation shall be by open cut except that sections of a trench may be jacked, bored, or tunneled if, in the opinion of the Contracting Officer, the pipe, cable, or duct can be safely and properly installed and backfill can be properly compacted in such sections.

3.1.2 Stockpiles

Stockpiles of satisfactory [and unsatisfactory] [and wasted materials] shall be placed and graded as specified. Stockpiles shall be kept in a neat and well drained condition, giving due consideration to drainage at all times. The ground surface at stockpile locations shall be cleared, grubbed, and sealed by rubber-tired equipment, excavated satisfactory and unsatisfactory materials shall be separately stockpiled. Stockpiles of satisfactory materials shall be protected from contamination which may destroy the quality and fitness of the stockpiled material. If the Contractor fails to protect the stockpiles, and any material becomes unsatisfactory, such material shall be removed and replaced with satisfactory material from approved sources at no additional cost to the Government. [Locations of stockpiles of satisfactory materials shall be [as shown] [subject to prior approval of the Contracting Officer].]

3.2 BACKFILLING AND COMPACTION

Backfill material shall consist of satisfactory material, select granular material, or initial backfill material as required. Backfill shall be placed in layers not exceeding 6 inches loose thickness for compaction by hand operated machine compactors, and 8 inches loose thickness for other than hand operated machines, unless otherwise specified. Each layer shall be compacted to at least 95 percent maximum density for cohesionless soils and 90 percent maximum density for cohesive soils, unless otherwise specified.

3.2.1 Trench Backfill

Trenches shall be backfilled to the grade shown. [The trench shall be backfilled to [_____] feet above the top of pipe prior to performing the required pressure tests. The joints and couplings shall be left uncovered during the pressure test.] [The trench shall not be backfilled until all specified tests are performed.]

3.2.1.1 Replacement of Unyielding Material

Unyielding material removed from the bottom of the trench shall be replaced

with select granular material or initial backfill material.

3.2.1.2 Replacement of Unstable Material

Unstable material removed from the bottom of the trench or excavation shall be replaced with select granular material placed in layers not exceeding 6 inches loose thickness.

3.2.1.3 Bedding and Initial Backfill

[Bedding shall be of the type and thickness shown.] Initial backfill material shall be placed and compacted with approved tampers to a height of at least one foot above the utility pipe or conduit. The backfill shall be brought up evenly on both sides of the pipe for the full length of the pipe. Care shall be taken to ensure thorough compaction of the fill under the haunches of the pipe.

3.2.1.4 Final Backfill

The remainder of the trench, except for special materials for roadways, railroads and airfields, shall be filled with satisfactory material. Backfill material shall be placed and compacted as follows:

a. Roadways, Railroads, and Airfields: Backfill shall be placed up to the elevation at which the requirements in Section 02300 EARTHWORK control. Water flooding or jetting methods of compaction will not be permitted.

b. Sidewalks, Turfed or Seeded Areas and Miscellaneous Areas: Backfill shall be deposited in layers of a maximum of 12 inch loose thickness, and compacted to 85 percent maximum density for cohesive soils and 90 percent maximum density for cohesionless soils. [Water flooding or jetting methods of compaction will be permitted for granular noncohesive backfill material. Water jetting shall not be allowed to penetrate the initial backfill.] [Compaction by water flooding or jetting will not be permitted.] This requirement shall also apply to all other areas not specifically designated above.

3.2.2 Backfill for Appurtenances

After the manhole, catchbasin, inlet, or similar structure has been constructed [and the concrete has been allowed to cure for [_____] days], backfill shall be placed in such a manner that the structure will not be damaged by the shock of falling earth. The backfill material shall be deposited and compacted as specified for final backfill, and shall be brought up evenly on all sides of the structure to prevent eccentric loading and excessive stress.

3.3 SPECIAL REQUIREMENTS

Special requirements for both excavation and backfill relating to the specific utilities are as follows:

3.3.1 Gas Distribution

Trenches shall be excavated to a depth that will provide not less than 18 inches of cover in rock excavation and not less than 24 inches of cover in other excavation. Trenches shall be graded as specified for pipe-laying

requirements in Section 02556 GAS DISTRIBUTION SYSTEM.

3.3.2 Water Lines

Trenches shall be of a depth to provide a minimum cover of [_____] feet from the existing ground surface, or from the indicated finished grade, whichever is lower, to the top of the pipe. [For fire protection yard mains or piping, an additional [_____] inches of cover is required.]

3.3.3 Heat Distribution System

Initial backfill material shall be free of stones larger than 1/4 inch in any dimension.

3.3.4 Electrical Distribution System

Direct burial cable and conduit or duct line shall have a minimum cover of 24 inches from the finished grade, unless otherwise indicated. [Special trenching requirements for direct-burial electrical cables and conduits are specified in Section 16375 ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND.]

3.3.5 Plastic Marking Tape

Warning [tapes][wires] shall be installed directly above the pipe, at a depth of [18] [_____] inches below finished grade unless otherwise shown.

3.4 TESTING

Testing shall be the responsibility of the Contractor and shall be performed at no additional cost to the Government.

3.4.1 Testing Facilities

Tests shall be performed by an approved commercial testing laboratory or may be tested by facilities furnished by the Contractor. No work requiring testing will be permitted until the facilities have been inspected and approved by the Contracting Officer.

3.4.2 Testing of Backfill Materials

Classification of backfill materials shall be determined in accordance with ASTM D 2487 and the moisture-density relations of soils shall be determined in accordance with ASTM D 1557. A minimum of one soil classification and one moisture-density relation test shall be performed on each different type of material used for bedding and backfill.

3.4.3 Field Density Tests

Tests shall be performed in sufficient numbers to ensure that the specified density is being obtained. A minimum of one field density test per lift of backfill for every [_____] feet of installation shall be performed. One moisture density relationship shall be determined for every 1500 cubic yards of material used. 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 the sand cone method as described in paragraph Calibration of the ASTM publication. ASTM D 2922 results in a wet unit weight of soil and when using this method, ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture

gauges shall 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, at intervals as directed by the Contracting Officer. Copies of calibration curves, results of calibration tests, and field and laboratory density tests shall be furnished to the Contracting Officer. Trenches improperly compacted shall be reopened to the depth directed, then refilled and compacted to the density specified at no additional cost to the Government.

3.4.4 Displacement of Sewers

After other required tests have been performed and the trench backfill compacted to [[_____] feet above the top of the pipe] [the finished grade surface], the pipe shall be inspected to determine whether significant displacement has occurred. This inspection shall be conducted in the presence of the Contracting Officer. Pipe sizes larger than 36 inches shall be entered and examined, while smaller diameter pipe shall be inspected by shining a light or laser between manholes or manhole locations, or by the use of television cameras passed through the pipe. If, in the judgement of the Contracting Officer, the interior of the pipe shows poor alignment or any other defects that would cause improper functioning of the system, the defects shall be remedied as directed at no additional cost to the Government.

-- End of Section --

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SECTION 02510A

WATER DISTRIBUTION SYSTEM
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN RAILWAY ENGINEERING & MAINTENANCE-OF-WAY ASSOCIATION (AREMA)

AREMA Manual	(1999) Manual for Railway Engineering (4 Vol.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 36/A 36M	(1997ael) Carbon Structural Steel
ASTM A 53	(1999b) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM B 88	(1996) Seamless Copper Water Tube
ASTM B 88M	(1996) Seamless Copper Water Tube (Metric)
ASTM C 76	(1999) Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C 76M	(1999a) Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe (Metric)
ASTM D 1599	(1999) Resistance to Short-Time Hydraulic Failure Pressure of Plastic Pipe, Tubing, and Fittings
ASTM D 1784	(1999a) Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D 1785	(1999) Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D 2241	(1996b) Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
ASTM D 2464	(1999) Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D 2466	(1999) Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40

ASTM D 2467	(1999) Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D 2564	(1996a) Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems
ASTM D 2657	(1997) Heat Fusion Joining Polyolefin Pipe and Fittings
ASTM D 2774	(1994) Underground Installation of Thermoplastic Pressure Piping
ASTM D 2855	(1996) Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings
ASTM D 2996	(1995) Filament-Wound "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
ASTM D 2997	(1995) Centrifugally Cast "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
ASTM D 3139	(1998) Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
ASTM D 3839	(1994a) Underground Installation of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pipe
ASTM D 4161	(1996) "Fiberglass"(Glass-Fiber-Reinforced Thermosetting Resin) Pipe Joints Using Elastomeric Seals
ASTM F 477	(1999) Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F 1483	(1998) Oriented Poly(Vinyl Chloride), PVCO, Pressure Pipe

ASME INTERNATIONAL (ASME)

ASME B1.20.1	(1983; R 1992) Pipe Threads, General Purpose (Inch)
ASME B16.1	(1998) Cast Iron Pipe Flanges and Flanged Fittings
ASME B16.3	(1992) Malleable Iron Threaded Fittings
ASME B16.26	(1988) Cast Copper Alloy Fittings for Flared Copper Tubes
ASME B36.10M	(1996) Welded and Seamless Wrought Steel Pipe

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA B300	(1992) Hypochlorites
AWWA B301	(1992) Liquid Chlorine
AWWA C104	(1995) Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
AWWA C110	(1993) Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (75 mm through 1200 mm), for Water and Other Liquids
AWWA C111	(1995) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C115	(1996) Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges
AWWA C151	(1996) Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids
AWWA C153	(1994; Errata Nov 1996) Ductile-Iron Compact Fittings, 3 In. Through 24 In. (76 mm through 610 mm) and 54 In. through 64 In. (1,400 mm through 1,600 mm) for Water Service
AWWA C200	(1997) Steel Water Pipe - 6 In. (150 mm) and Larger
AWWA C203	(1997) Coal-Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot-Applied
AWWA C205	(1995) Cement-Mortar Protective Lining and Coating for Steel Water Pipe - 4 In. (100 mm) and Larger - Shop Applied
AWWA C207	(1994) Steel Pipe Flanges for Waterworks Service - Sizes 4 In. Through 144 In. (100 mm through 3,600 mm)
AWWA C208	(1996) Dimensions for Fabricated Steel Water Pipe Fittings
AWWA C300	(1997) Reinforced Concrete Pressure Pipe, Steel-Cylinder Type, for Water and Other Liquids
AWWA C301	(1992) Prestressed Concrete Pressure Pipe, Steel-Cylinder Type, for Water and Other Liquids
AWWA C303	(1995) Concrete Pressure Pipe, Bar-Wrapped, Steel Cylinder Type
AWWA C500	(1993; C500a) Metal-Sealed Gate Valves for Water Supply Service

AWWA C502	(1994; C502a) Dry-Barrel Fire Hydrants
AWWA C503	(1997) Wet-Barrel Fire Hydrants
AWWA C504	(1994) Rubber-Seated Butterfly Valves
AWWA C509	(1994; Addendum 1995) Resilient-Seated Gate Valves for Water Supply Service
AWWA C600	(1993) Installation of Ductile-Iron Water Mains and Their Appurtenances
AWWA C606	(1997) Grooved and Shouldered Joints
AWWA C651	(1992) Disinfecting Water Mains
AWWA C700	(1995) Cold-Water Meters - Displacement Type, Bronze Main Case
AWWA C701	(1988) Cold-Water Meters - Turbine Type, for Customer Service
AWWA C702	(1992) Cold-Water Meters - Compound Type
AWWA C703	(1996) Cold-Water Meters - Fire Service Type
AWWA C704	(1992) Propeller-Type Meters Waterworks Applications
AWWA C706	(1996) Direct-Reading, Remote-Registration Systems for Cold-Water Meters
AWWA C707	(1982; R 1992) Encoder-Type Remote-Registration Systems for Cold-Water Meters
AWWA C800	(1989) Underground Service Line Valves and Fittings
AWWA C900	(1997; C900a) Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In., for Water Distribution
AWWA C901	(1996) Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. Through 3 In., for Water Service
AWWA C905	(1997) Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameters 14 In. Through 36 In.
AWWA C909	(1998) Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe, 4 IN through 12 IN (100 mm through 300 mm), for Water Distribution
AWWA C950	(1995) Fiberglass Pressure Pipe

AWWA M23	(1980) Manual: PVC Pipe - Design and Installation

ASBESTOS CEMENT PIPE PRODUCERS ASSOCIATION (ACPPA)

ACPPA 1344	(1988) Recommended Work Practices for A/C Pipe

DUCTILE IRON PIPE RESEARCH ASSOCIATION (DIPRA)

DIPRA TRD	(1997) Thrust Restraint Design for Ductile Iron Pipe

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS SP-80	(1997) Bronze Gate, Globe, Angle and Check Valves

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 24	(1995) Installation of Private Fire Service Mains and Their Appurtenances
NFPA 49	(1994) Hazardous Chemicals Data
NFPA 325-1	(1994) Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids
NFPA 704	(1996) Identification of the Fire Hazards of Materials for Emergency Response
NFPA 1961	(1997) Fire Hose

NSF INTERNATIONAL (NSF)

NSF 14	(1998) Plastics Piping Components and Related Materials
NSF 61	(1999) Drinking Water System Components - Health Effects (Sections 1-9)

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC Paint 21	(1991) White or Colored Silicone Alkyd Paint
SSPC Paint 25	(1991) Red Iron Oxide, Zinc Oxide, Raw Linseed Oil and Alkyd Primer (Without Lead and Chromate Pigments)

1.2 PIPING

This section covers water [supply] [distribution] [service] lines, and connections to building service at a point approximately 5 feet outside buildings and structures to which service is required. The Contractor shall have a copy of the manufacturer's recommendations for each material or procedure to be utilized available at the construction site at all times.

1.2.1 Service Lines

Piping for water service lines less than 3 inchesin diameter shall be galvanized steel, polyvinyl chloride (PVC) plastic, Oriented PVC plastic polyethylene, or copper tubing, unless otherwise shown or specified. Piping for water service lines 3 inchesand larger shall be ductile iron, polyvinyl chloride (PVC) plastic, filament-wound or centrifugally cast reinforced thermosetting resin, reinforced plastic mortar pressure pipe or steel, unless otherwise shown or specified.

1.2.2 Distribution Lines 80 mm (3 Inches) or Larger

Piping for water distribution lines 3 inches or larger shall be ductile iron, polyvinyl chloride (PVC) through 36 inch nominal diameter plastic, Oriented PVC plastic filament-wound or centrifugally cast reinforced thermosetting resin, reinforced plastic mortar pressure pipe, or reinforced concrete, unless otherwise shown or specified.

1.2.3 Supply Lines 80 mm (3 Inches) or Larger

Piping for water supply lines 3 inches or larger shall be ductile iron, polyvinyl chloride (PVC) plastic, through 36 inch nominal diameter, Oriented PVC plastic filament-wound reinforced or centrifugally cast reinforced thermosetting resin, reinforced plastic mortar pressure pipe, steel, or reinforced concrete, unless otherwise shown or specified.

1.2.4 Sprinkler Supply Lines

Piping for water lines supplying sprinkler systems for building fire protection shall conform to NFPA 24 from the point of connection with the water distribution system to the building 5 foot line.

1.2.5 Potable Water Lines

Piping and components of potable water systems which come in contact with the potable water shall conform to NSF 61.

1.2.6 Plastic Piping System

Plastic piping system components (PVC, polyethylene, thermosetting resin and reinforced plastic mortar pressure) intended for transportation of potable water shall comply with NSF 14 and be legibly marked with their symbol.

1.2.7 Excavation, Trenching, and Backfilling

Excavation, trenching, and backfilling shall be in accordance with the applicable provisions of Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS, except as modified herein.

1.3 UNIT PRICES

Measurement and payment will be based on completed work performed in accordance with the drawings, specifications, and the contract payment schedules. Payment will not be made under this section for excavation, trenching, or backfilling. Payment for such work will be made under Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

1.3.1 Measurement

The length of water lines to be paid for will be determined by measuring along the centerlines of the various sizes of pipe furnished and installed. Pipe will be measured from center of fitting to center of fitting, from center of water distribution line to end of service connection, and from center of water distribution line to center of hydrant. No deduction will be made for the space occupied by valves or fittings.

1.3.2 Payment

Payment will be made for water lines at the contract unit price per linear foot for the various types and sizes of water lines, and will be full compensation for all pipes, joints, specials, and fittings, complete in place. Payment for fire hydrants, gate valves, valve boxes, and standard valve manholes will be made at the respective contract unit price each for such items complete in place. Payment will include the furnishing of all testing, plant, labor, and material and incidentals necessary to complete the work, as specified and as shown.

1.4 MANUFACTURER'S REPRESENTATIVE

The Contractor shall have a manufacturer's field representative present at the jobsite during the installation and testing of PE, RTRP, and/or RPMP pipe to provide technical assistance and to verify that the materials are being installed in accordance with the manufacturer's prescribed procedures. When the representative feels that the Contractor is installing and testing the PE, RTRP, and/or RPMP pipe in a satisfactory manner, certification shall be written to note which individuals employed by the Contractor are capable of properly installing the pipe. The field representative shall advise the Contractor of unsatisfactory conditions immediately when they occur. Such conditions include improper diameter of pipe ends, damaged interior liner, poorly prepared joints, improper curing of joints, moving pipe before joints are cured, bending pipe to follow abrupt changes in trench contours, leaving pipe ends open in trench overnight, not properly drying joints after rain storms, exceeding effective adhesive life, sharp objects in trench bed, backfill that could damage pipe, improper procedure for concrete encasement of pipe, omission of thrust blocks at changes in direction or any other condition which could have an adverse effect on the satisfactory completion and operation of the piping system.

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

Installation; [_____], [_____].

The manufacturer's recommendations for each material or procedure to be utilized.

Waste Water Disposal Method; [_____], [_____].

The method proposed for disposal of waste water from hydrostatic tests and disinfection, prior to performing hydrostatic tests.

Satisfactory Installation; [_____], [_____].

A statement signed by the principal officer of the contracting firm stating that the installation is satisfactory and in accordance with the contract drawings and specifications, and the manufacturer's prescribed procedures and techniques, upon completion of the project and before final acceptance.

SD-06 Test Reports

Bacteriological Disinfection; [_____], [_____].

Test results from commercial laboratory verifying disinfection.

SD-07 Certificates

Manufacturer's Representative; [_____], [_____].

The name and qualifications of the manufacturer's representative and written certification from the manufacturer that the representative is technically qualified in all phases of PE, RTRP, and/or RPMP pipe laying and jointing and experienced to supervise the work and train the Contractor's field installers, prior to commencing installation.

Installation; [_____], [_____].

A statement signed by the manufacturer's field representative certifying that the Contractor's personnel are capable of properly installing the pipe on the project.

Meters; [_____], [_____].

Manufacturer's certificate stating that each meter furnished has been tested for accuracy of registration and compliance with the accuracy and capacity requirements of the appropriate AWWA standard.

1.6 HANDLING

Pipe and accessories shall be handled to ensure delivery to the trench in sound, undamaged condition, including no injury to the pipe coating or lining. If the coating or lining of any pipe or fitting is damaged, the repair shall be made by the Contractor in a satisfactory manner, at no additional cost to the Government. No other pipe or material shall be placed inside a pipe or fitting after the coating has been applied. Pipe shall be carried into position and not dragged. Use of pinch bars and tongs for aligning or turning pipe will be permitted only on the bare ends of the pipe. The interior of pipe and accessories shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved method. Before installation, the pipe shall be inspected for defects. Material found to be defective before or after laying shall be replaced with sound material without additional expense to the Government. Rubber gaskets that are not to be installed immediately shall be stored in a cool and dark place.

1.6.1 Coated and Wrapped Steel Pipe

Coated and wrapped steel pipe shall be handled in conformance with AWWA C203.

1.6.2 Polyethylene (PE) Pipe Fittings and Accessories

PE pipe, fittings, and accessories shall be handled in conformance with AWWA C901.

1.6.3 Miscellaneous Plastic Pipe and Fittings

Polyvinyl Chloride (PVC), Reinforced Thermosetting Resin Pipe (RTRP), and Reinforced Plastic Mortar Pressure (RPMP) pipe and fittings shall be handled and stored in accordance with the manufacturer's recommendations. Storage facilities shall be classified and marked in accordance with NFPA 704, with classification as indicated in NFPA 49 and NFPA 325-1.

PART 2 PRODUCTS

2.1 PIPE

Pipe shall conform to the respective specifications and other requirements specified below.

2.1.1 Reinforced and Prestressed Concrete Pipe

Steel cylinder reinforced concrete pipe shall conform to AWWA C300, AWWA C301, or AWWA C303 and shall be designed to withstand a working pressure of not less than 150 psi unless otherwise shown or specified.

2.1.2 Plastic Pipe

2.1.2.1 PE Plastic Pipe

Pipe, tubing, and heat-fusion fittings shall conform to AWWA C901.

2.1.2.2 PVC Plastic Pipe

Pipe, couplings and fittings shall be manufactured of material conforming to ASTM D 1784, Class 12454B.

a. Pipe Less Than 4 inch Diameter:

(1) Screw-Joint: Pipe shall conform to dimensional requirements of ASTM D 1785 Schedule 80, with joints meeting requirements of 150 psi working pressure, 200 psi hydrostatic test pressure, unless otherwise shown or specified. Pipe couplings when used, shall be tested as required by ASTM D 2464.

(2) Elastomeric-Gasket Joint: Pipe shall conform to dimensional requirements of ASTM D 1785 Schedule 40, with joints meeting the requirements of 150 psi working pressure, 200 psi hydrostatic test pressure, unless otherwise shown or specified, or it may be pipe conforming to requirements of ASTM D 2241, elastomeric joint, with the following applications:

SDR	Maximum Working Pressure psi	Minimum Hydrostatic Pressure psi
26	100	133
21	120	160
17	150	200
13.5	200	266

(3) Solvent Cement Joint: Pipe shall conform to dimensional requirements of ASTM D 1785 or ASTM D 2241 with joints meeting the requirements of 150 psi working pressure and 200 psi hydrostatic test pressure.

b. Pipe 4 through 12 inch Diameter: Pipe, couplings and fittings shall conform to AWWA C900, Class 150, CIOD pipe dimensions, elastomeric-gasket joint, unless otherwise shown or specified.

c. Pipe 14 through 36 inch Diameter: Pipe shall conform to AWWA C905 unless otherwise shown or specified.

2.1.2.3 Oriented Polyvinyl Chloride (PVCO) Plastic Pipe

Pipe, couplings, and fittings shall be manufactured of material conforming to ASTM D 1784, Class 12454-B. Pipe shall conform to AWWA C909, Class 150, and to ASTM F 1483 and shall have an outside diameter equal to cast iron outside diameter.

2.1.3 Reinforced Plastic Mortar Pressure (RPMP) Pipe

RPMP shall be produced by centrifugal casting and shall have an OD 12 to 48 inches equal to ductile-iron, with a 150 psi pressure rating and with a minimum pipe stiffness of 36 psi. RPMP shall be in accordance with AWWA C950.

2.1.4 Reinforced Thermosetting Resin Pipe (RTRP)

Pipe shall have a quick-burst strength greater than or equal to four times the normal working pressure of the pipe. The quick-burst strength test shall conform to the requirements of ASTM D 1599.

2.1.4.1 RTRP-I

RTRP-I shall conform to ASTM D 2996, except pipe shall have an outside diameter equal to cast iron outside diameter or standard weight steel pipe. The pipe shall be suitable for a normal working pressure of 150 psi at 73 degrees F. The inner surface of the pipe shall have a smooth uniform continuous resin-rich surface liner conforming to ASTM D 2996.

2.1.4.2 RTRP-II

RTRP-II shall conform to ASTM D 2997. Pipe shall have an outside diameter equal to standard weight steel pipe.

2.1.5 Ductile-Iron Pipe

Ductile-iron pipe shall conform to AWWA C151, working pressure not less

than 150 psi, unless otherwise shown or specified. Pipe shall be cement-mortar lined in accordance with AWWA C104. Linings shall be standard. When installed underground, pipe shall be coated in accordance with Section 13110 CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE). Flanged ductile iron pipe with threaded flanges shall be in accordance with AWWA C115.

2.1.6 Steel Pipe

2.1.6.1 Pipe 80 mm (3 Inches) and Larger, Not Galvanized

Steel pipe, not galvanized, shall conform to AWWA C200 with dimensional requirements as given in ASME B36.10M for pipe 6 inches in diameter and larger, and ASTM A 53 for smaller sizes. Pipe shall be welded or seamless with plain or shouldered and grooved ends in accordance with AWWA C606 for use with mechanical couplings or bell-and-spigot ends with rubber gaskets. Bell-and-spigot ends for sizes less than 6 inches diameter shall be as required by AWWA C200. The minimum wall thickness of the various sizes of pipe shall be as follows:

Pipe Sizes	Thickness
[_____]	[_____]

2.1.6.2 Galvanized Steel Pipe

Galvanized steel pipe shall conform to ASTM A 53, standard weight.

2.1.6.3 Protective Materials for Steel Pipe

Protective materials for steel pipe, except as otherwise specified, shall be mechanically applied in a factory or plant especially equipped for the purpose. The materials shall, unless otherwise indicated on the drawings, consist of [one of the following] [the following] for the indicated pipe material and size:

a. Pipe and fittings less than 3 inches in diameter shall be thoroughly cleaned of foreign material by wire brushing and solvent cleaning, and then given 1 coat of coal-tar primer and 2 coats of coal-tar enamel conforming to AWWA C203; threaded ends of pipe and fittings shall be adequately protected prior to coating.

b. Pipe 3 Inches or Larger, Not Galvanized:

(1) Cement-mortar coating and lining shall conform to and shall be applied in conformance with AWWA C205. Cement-mortar coating and linings shall not be used for pipe less than 4 inches in diameter.

(2) Coal-tar enamel lining, coating and wrapping shall conform to AWWA C203 for materials, method of application, tests and handling. Non-asbestos material shall be used for the outerwrap.

(3) Cement-mortar lining, in lieu of coal-tar enamel lining, may be used with coal-tar enamel coating and wrapping. Cement-mortar lining shall conform to and shall be applied in conformance with AWWA C205.

2.1.7 Copper Tubing

Copper tubing shall conform to ASTM B 88, Type K, annealed.

2.2 FITTINGS AND SPECIALS

2.2.1 Reinforced Concrete Pipe System

Fittings and specials required for closures, curves, bends, branches and connections to valves, pipe, or structures shall be approved by the Contracting Officer and conform to the details furnished by the manufacturer and to AWWA C300, AWWA C301, or AWWA C303, as applicable.

2.2.2 PVC Pipe System

a. For pipe less than 4 inch diameter, fittings for threaded pipe shall conform to requirements of ASTM D 2464, threaded to conform to the requirements of ASME B1.20.1 for use with Schedule 80 pipe and fittings; fittings for solvent cement jointing shall conform to ASTM D 2466 or ASTM D 2467; and fittings for elastomeric-gasket joint pipe shall be iron conforming to AWWA C110 or AWWA C111. Iron fittings and specials shall be cement-mortar lined (standard thickness) in accordance with AWWA C104.

b. For pipe 4 inch diameter and larger, fittings and specials shall be iron, bell end in accordance with AWWA C110, 150 psi pressure rating unless otherwise shown or specified, except that profile of bell may have special dimensions as required by the pipe manufacturer; or fittings and specials may be of the same material as the pipe with elastomeric gaskets, all in conformance with AWWA C900. Iron fittings and specials shall be cement-mortar lined (standard thickness) in accordance with AWWA C104. Fittings shall be bell and spigot or plain end pipe, or as applicable. Ductile iron compact fittings shall be in accordance with AWWA C153.

2.2.3 RTRP and RPMP Pipe

Fittings and specials shall be compatible with the pipe supplied. Filament wound or molded fittings up to 6 inches shall conform to AWWA C950. Iron fittings shall be cement-mortar lined in accordance with AWWA C104 and shall conform to AWWA C110 and AWWA C111. Fittings shall be suitable for working and testing pressures specified for the pipe.

2.2.4 Ductile-Iron Pipe System

Fittings and specials shall be suitable for 150 psi pressure rating, unless otherwise specified. Fittings and specials for mechanical joint pipe shall conform to AWWA C110. Fittings and specials for use with push-on joint pipe shall conform to AWWA C110 and AWWA C111. Fittings and specials for grooved and shouldered end pipe shall conform to AWWA C606. Fittings and specials shall be cement-mortar lined (standard thickness) in accordance with AWWA C104. Ductile iron compact fittings shall conform to AWWA C153.

2.2.5 Steel Pipe System

2.2.5.1 Not Galvanized Steel Pipe

Fittings and specials shall be made of the same material as the pipe. Specials and fittings may be made of standard steel tube turns or segmentally welded sections, with ends to accommodate the type of couplings

or joints specified for the pipe. Dimensions of steel pipe fittings shall be in accordance with AWWA C208. The thickness and pressure rating of pipe fittings and specials shall be not less than the thickness specified and the pressure rating calculated for the pipe with which they are used. Protective materials for fittings and specials shall be as specified for the pipe. Specials and fittings that cannot be mechanically lined, coated, and wrapped shall be lined, coated, and wrapped by hand, using the same material used for the pipe with the same number of applications of each material, smoothly applied.

2.2.5.2 Galvanized Steel Piping

Steel fittings shall be galvanized. Screwed fittings shall conform to ASME B16.3. Flanged fittings shall conform to AWWA C207.

2.2.5.3 Dielectric Fittings

Dielectric fittings shall be installed between threaded ferrous and nonferrous metallic pipe, fittings and valves, except where corporation stops join mains. Dielectric fittings shall prevent metal-to-metal contact of dissimilar metallic piping elements and shall be suitable for the required working pressure.

2.2.6 Copper Tubing System

Fittings and specials shall be flared and conform to ASME B16.26.

2.3 JOINTS

2.3.1 Gaskets for Reinforced Concrete Pipe

Rubber-gasket joints shall be of the type using a bell-and-spigot joint design of steel. The gaskets shall conform to AWWA C300, AWWA C301, or AWWA C303, as applicable.

2.3.2 Plastic Pipe Jointing

2.3.2.1 PE Pipe

Joints for pipe fittings and couplings shall be strong tight joints as specified for PE in Paragraph INSTALLATION. Joints connecting pipe of differing materials shall be made in accordance with the manufacturer's recommendation, and as approved by the Contracting Officer.

2.3.2.2 PVC Pipe

Joints, fittings, and couplings shall be as specified for PVC pipe. Joints connecting pipe of differing materials shall be made in accordance with the manufacturer's recommendations, and as approved by the Contracting Officer.

2.3.2.3 PVCO Pipe

Joints shall conform to ASTM D 3139. Elastomeric gaskets shall conform to ASTM F 477.

2.3.3 RPMP Pipe

Joints shall be bell and spigot gasket coupling utilizing an elastomeric gasket in accordance with ASTM D 4161.

2.3.4 RTRP Pipe

2.3.4.1 RTRP-I, Grade 1 and 2

Joints shall be bell and spigot with elastomeric gasket, mechanical coupling with elastomeric gasket, threaded and bonded coupling, or tapered bell and spigot with compatible adhesive. All RTRP-I materials shall be products of a single manufacturer.

2.3.4.2 RTRP-II, Grade 1 and 2

Joints shall be the bell and spigot type with elastomeric gasket, bell and spigot with adhesive, butt-jointed with adhesive bonded reinforced overlay, mechanical, flanged, threaded or commercially available proprietary joints, provided they are capable of conveying water at the pressure and temperature of the pipe.

2.3.5 Ductile-Iron Pipe Jointing

a. Mechanical joints shall be of the stuffing box type and shall conform to AWWA C111.

b. Push-on joints shall conform to AWWA C111.

c. Rubber gaskets and lubricants shall conform to the applicable requirements of AWWA C111.

2.3.6 Steel Pipe Jointing

2.3.6.1 Steel Pipe, Not Galvanized

a. Mechanical couplings shall be as specified.

b. Bell-and-spigot joints for use with rubber gaskets shall conform to AWWA C200, as appropriate for the type of pipe. Rubber gaskets shall conform to applicable requirements of AWWA C200.

c. Flanges shall conform to AWWA C207, and shall be used only in above ground installation or where shown on the drawings, or when approved.

2.3.6.2 Mechanical Couplings

Mechanical couplings for steel pipe shall be the sleeve type, or when approved, the split-sleeve type and shall provide a tight flexible joint under all reasonable conditions, such as pipe movements caused by expansion, contraction, slight setting or shifting in the ground, minor variations in trench gradients, and traffic vibrations. Couplings shall be of strength not less than the adjoining pipeline.

2.3.7 Bonded Joints

[Where indicated] [For all ferrous pipe], a metallic bond shall be provided at each joint, including joints made with flexible couplings, caulking, or rubber gaskets, of ferrous metallic piping to effect continuous conductivity. The bond wire shall be Size 1/0 copper conductor suitable for direct burial shaped to stand clear of the joint. The bond shall be of the thermal weld type.

2.3.8 Isolation Joints

Isolation joints shall be installed between nonthreaded ferrous and nonferrous metallic pipe, fittings and valves. Isolation joints shall consist of a sandwich-type flange isolation gasket of the dielectric type, isolation washers, and isolation sleeves for flange bolts. Isolation gaskets shall be full faced with outside diameter equal to the flange outside diameter. Bolt isolation sleeves shall be full length. Units shall be of a shape to prevent metal-to-metal contact of dissimilar metallic piping elements.

a. Sleeve-type couplings shall be used for joining plain end pipe sections. The two couplings shall consist of one steel middle ring, two steel followers, two gaskets, and the necessary steel bolts and nuts to compress the gaskets.

b. Split-sleeve type couplings may be used in aboveground installations when approved in special situations and shall consist of gaskets and a housing in two or more sections with the necessary bolts and nuts.

2.3.9 Copper Tubing Jointing

Joints shall be compression-pattern flared and shall be made with the specified fittings.

2.4 VALVES

2.4.1 Check Valves

Check valves shall be designed for a minimum working pressure of 150 psi or as indicated. Valves shall have a clear waterway equal to the full nominal diameter of the valve. Valves shall open to permit flow when inlet pressure is greater than the discharge pressure, and shall close tightly to prevent return flow when discharge pressure exceeds inlet pressure. The size of the valve, working pressure, manufacturer's name, initials, or trademark shall be cast on the body of each valve. Valves 2 inches and larger shall be [outside lever and spring] [outside lever and weight] [_____] type.

a. Valves 2 inches and smaller shall be all bronze designed for screwed fittings, and shall conform to MSS SP-80, Class 150, Types 3 and 4 as suitable for the application.

b. Valves larger than 2 inches shall be iron body, bronze mounted, shall have flanged ends, and shall be the non-slam type. Flanges shall be the Class 125 type conforming to ASME B16.1.

2.4.2 Gate Valves

Gate valves shall be designed for a working pressure of not less than 150 psi. Valve connections shall be as required for the piping in which they are installed. Valves shall have a clear waterway equal to the full nominal diameter of the valve, and shall be opened by turning counterclockwise. The operating nut or wheel shall have an arrow, cast in the metal, indicating the direction of opening.

a. Valves smaller than 3 inches shall be all bronze and shall conform

to MSS SP-80, Type 1, Class 150.

b. Valves 3 inches and larger shall be iron body, bronze mounted, and shall conform to AWWA C500. Flanges shall not be buried. An approved pit shall be provided for all flanged connections.

c. Resilient-Seated Gate Valves: For valves 3 to 12 inches in size, resilient-seated gate valves shall conform to AWWA C509.

2.4.3 Rubber-Seated Butterfly Valves

Rubber-seated butterfly valves shall conform to the performance requirements of AWWA C504. Wafer type valves conforming to the performance requirements of AWWA C504 in all respects, but not meeting laying length requirements will be acceptable if supplied and installed with a spacer providing the specified laying length. All tests required by AWWA C504 shall be met. Flanged-end valves shall be installed in an approved pit and provided with a union or sleeve-type coupling in the pit to permit removal. Mechanical-end valves 3 through 10 inches in diameter may be direct burial if provided with a suitable valve box, means for manual operation, and an adjacent pipe joint to facilitate valve removal. Valve operators shall restrict closing to a rate requiring approximately 60 seconds, from fully open to fully closed.

2.4.4 Pressure Reducing Valves

Pressure reducing valves shall maintain a constant downstream pressure regardless of fluctuations in demand. Valves shall be suitable for [_____] psi operating pressure on the inlet side, with outlet pressure set for [_____] psi. The valves shall be of the hydraulically-operated, pilot controlled, globe or angle type, and may be actuated either by diaphragm or piston. The pilot control shall be the diaphragm-operated, adjustable, spring-loaded type, designed to permit flow when controlling pressure exceeds the spring setting. Ends shall be [threaded] [flanged]. Valve bodies shall be bronze, cast iron or cast steel with bronze trim. Valve stem shall be stainless steel. Valve discs and diaphragms shall be synthetic rubber. Valve seats shall be bronze. Pilot controls shall be bronze with stainless steel working parts.

2.4.5 Vacuum and Air Relief Valves

Vacuum and air relief valves shall be of the size shown and shall be of a type that will release air and prevent the formation of a vacuum. The valves shall automatically release air when the lines are being filled with water and shall admit air into the line when water is being withdrawn in excess of the inflow. Valves shall be iron body with bronze trim and stainless steel float.

2.4.6 Indicator Post for Valves

Each valve shown on the drawings with the designation "P.I.V." shall be equipped with indicator post conforming to the requirements of NFPA 24. Operation shall be by a wrench which shall be attached to each post.

2.5 VALVE BOXES

Valve boxes shall be cast iron or concrete, except that concrete boxes may be installed only in locations not subjected to vehicular traffic. Cast-iron boxes shall be extension type with slide-type adjustment and with

flared base. The minimum thickness of metal shall be 3/16 inch. Concrete boxes shall be the standard product of a manufacturer of precast concrete equipment. The word "WATER" shall be cast in the cover. The box length shall adapt, without full extension, to the depth of cover required over the pipe at the valve location.

2.6 VALVE PITS

Valve pits shall be constructed at locations indicated or as required above and in accordance with the details shown. Concrete shall have compressive strength of 3000 psi in accordance with Section 03300CAST-IN-PLACE STRUCTURAL CONCRETE.

2.7 FIRE HYDRANTS

Hydrants shall be [dry-barrel type conforming to AWWA C502 with valve opening at least 5 inches in diameter and designed so that the flange at the main valve seat can be removed with the main valve seat apparatus remaining intact, closed and reasonably tight against leakage and with a breakable valve rod coupling and breakable flange connections located no more than 8 inches above the ground grade] [wet-barrel type conforming to AWWA C503, with either an automatic breakoff check valve or an auxiliary gate valve on hydrant branch]. Hydrants shall have a 6 inch bell connection, two 2-1/2 inch hose connections and one 4-1/2 inch pumper connection. Outlets shall have American National Standard fire-hose coupling threads. Working parts shall be bronze. Design, material, and workmanship shall be equal to the latest stock pattern ordinarily produced by the manufacturer. Hydrants shall be painted with 1 coat of red iron oxide, zinc oxide primer conforming to SSPC Paint 25 and 2 finish coats of silicone alkyd paint conforming to SSPC Paint 21, [of the installation's standard colors or as directed by the Contracting Officer] [color in accordance with NFPA recommendations]. Suitable bronze adapter for [the 4-1/2 inch] [each] outlet, with caps, shall be furnished.

2.8 FIRE-HYDRANT HOSE HOUSES

Hose houses conforming to the requirements of NFPA 24 shall be furnished at each fire hydrant indicated on the drawings to have a fire-hydrant hose house. The following equipment, in addition to that listed in NFPA 24, paragraph 5-6.1, shall be furnished with each hose house:

a. 200 feet of 2-1/2 inch, woven jacketed, rubber lined hose conforming to NFPA 1961 with a minimum service test pressure of 300 psi.

b. 100 feet of 1-1/2 inch, woven jacketed, rubber lined hose conforming to NFPA 1961 with a minimum service test pressure of 300 psi.

c. One gated 2-1/2 by 1-1/2 by 1-1/2 inch wye.

d. One playpipe for 2-1/2 inch hose with 1 inch shutoff nozzle tip.

e. One playpipe for 1-1/2 inch hose with 1/2 inch shutoff nozzle or combination nozzle.

f. Two adapter fittings, 2-1/2 to 1-1/2 inch.

g. Two spanners for 1-1/2 inch hose.

2.9 MISCELLANEOUS ITEMS

2.9.1 Service Clamps

Service clamps shall have a pressure rating not less than that of the pipe to be connected and shall be either the single or double flattened strap type. Clamps shall have a galvanized malleable-iron body with cadmium plated straps and nuts. Clamps shall have a rubber gasket cemented to the body.

2.9.2 Corporation Stops

Corporation stops shall have standard corporation stop thread conforming to AWWA C800 on the inlet end, with flanged joints, compression pattern flared tube couplings, or wiped joints for connections to goosenecks.

2.9.3 Goosenecks

Copper tubing for gooseneck connections shall conform to the applicable requirements of ASTM B 88, Type K, annealed. Length of cable requirement connections shall be in accordance with standard practice.

2.9.4 Service Stops

Service stops shall be water-works inverted-ground-key type, oval or round flow way, tee handle, without drain. Pipe connections shall be suitable for the type of service pipe used. All parts shall be of bronze with female iron-pipe-size connections or compression-pattern flared tube couplings, and shall be designed for a hydrostatic test pressure not less than 200 psi.

2.9.5 Tapping Sleeves

Tapping sleeves of the sizes indicated for connection to existing main shall be the cast gray, ductile, or malleable iron, split-sleeve type with flanged or grooved outlet, and with bolts, follower rings and gaskets on each end of the sleeve. Construction shall be suitable for a maximum working pressure of [150] [_____] psi. Bolts shall have square heads and hexagonal nuts. Longitudinal gaskets and mechanical joints with gaskets shall be as recommended by the manufacturer of the sleeve. When using grooved mechanical tee, it shall consist of an upper housing with full locating collar for rigid positioning which engages a machine-cut hole in pipe, encasing an elastomeric gasket which conforms to the pipe outside diameter around the hole and a lower housing with positioning lugs, secured together during assembly by nuts and bolts as specified, pretorqued to 50 foot-pound.

2.9.6 Service Boxes

Service boxes shall be cast iron or concrete and shall be extension service boxes of the length required for the depth of the line, with either screw or slide-type adjustment. The boxes shall have housings of sufficient size to completely cover the service stop or valve and shall be complete with identifying covers.

2.9.7 Disinfection

Chlorinating materials shall conform to the following:

Chlorine, Liquid: AWWA B301.

Hypochlorite, Calcium and Sodium: AWWA B300.

2.9.8 Meters

Meters shall be the type and size shown on the drawings or specified. Meters of each of the various types furnished and installed shall be supplied by one manufacturer.

2.9.8.1 Displacement Type

Displacement type meters shall conform to AWWA C700. Registers shall be straight-reading and shall read in [U.S. gallons] [cubic feet]. Meters in sizes 1/2 through 1 inch [shall] [shall not] be frost-protection design. Connections shall be suitable to the type of pipe and conditions encountered. Register type shall be [a direct reading remote register designed in accordance with AWWA C706] [or] [an encoder type remote register designed in accordance with AWWA C707]. Meters shall comply with the accuracy and capacity requirements of AWWA C700.

2.9.8.2 Turbine Type

Turbine type meters shall conform to AWWA C701 [Class I] [Class II]. The main casing shall be [bronze] [cast iron protected by corrosion resistant coating] with stainless steel external fasteners. Registers shall be straight-reading type, shall be [permanently sealed] [open] and shall read in [U.S. gallons] [cubic feet]. Connections shall be suitable to the type of pipe and conditions encountered. Register type shall be [a direct reading remote register designed in accordance with AWWA C706] [or] [an encoder type remote register designed in accordance with AWWA C707]. Meters shall comply with the accuracy and capacity requirements of AWWA C701.

2.9.8.3 Compound Type

Compound type meters shall conform to AWWA C702 and [shall] [shall not] be furnished with strainers. The main casing shall be [bronze] [cast iron protected by corrosion resistant coating] with stainless steel external fasteners. The main casing shall be tapped for field testing purposes. Registers shall be straight-reading type, shall be [permanently sealed] [open] and shall read in [U.S. gallons] [cubic feet]. The meter [shall] [shall not] be equipped with a coordinating register. Connections shall be suitable to the type of pipe and conditions encountered. Register type shall be [a direct reading remote register designed in accordance with AWWA C706] [or] [an encoder type remote register designed in accordance with AWWA C707]. Meters shall comply with the accuracy and capacity requirements of AWWA C702.

2.9.8.4 Fire Service Type

Fire service type meters shall be [proportional type] [turbine type] conforming to AWWA C703 and [shall] [shall not] be furnished with strainers. The main casing shall be [bronze] [cast iron protected by corrosion resistant coating] with stainless steel external fasteners. Registers shall be straight-reading type, shall be [permanently sealed] [open] and shall read in [U.S. gallons] [cubic feet]. The meter [shall] [shall not] be equipped with a coordinating register. Connections shall be suitable to the type of pipe and conditions encountered. Register type

shall be [a direct reading remote register designed in accordance with AWWA C706] [or] [an encoder type remote register designed in accordance with AWWA C707]. Meters shall comply with the accuracy and capacity requirements of AWWA C703. When turbine type main line meters are used, the meter shall be supplied with a separate check valve, as a unit.

2.9.8.5 Propeller Type

Propeller type meters shall conform to AWWA C704. Registers shall be straight-reading type, shall be [permanently sealed] [open] and shall read in [U.S. gallons] [cubic feet]. Connections shall be suitable to the type of pipe and conditions encountered. Register type shall be [a direct-reading remote register designed in accordance with AWWA C706] [or] [an encoder-type remote register designed in accordance with AWWA C707]. Meters shall comply with the accuracy and capacity requirements of AWWA C703.

2.9.9 Meter Boxes

Meter boxes shall be of cast iron, concrete, or plastic. The boxes shall be of sufficient size to completely enclose the meter and shutoff valve or service stop. Meter boxes set in paved areas subject to vehicular traffic shall be cast iron, or concrete with cast iron lid and cast iron meter reader lid. Boxes set in sidewalks, not subject to vehicular traffic, [shall use concrete covers with cast iron meter reader lids] [shall be concrete with cast iron lid and cast iron meter reader lid]. Plastic boxes and lids [shall] [shall not] be used in unpaved areas or grass areas not subject to vehicular traffic. Box height shall extend from invert of the meter to final grade at the meter location. The lid shall have the word "WATER" cast in it.

2.10 METER VAULTS

Large meters shall be installed in reinforced concrete vaults in accordance with the details shown on the drawings.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Cutting of Pipe

Cutting of pipe shall be done in a neat and workmanlike manner without damage to the pipe. Unless otherwise recommended by the manufacturer and authorized by the Contracting Officer, cutting shall be done with an approved type mechanical cutter. Wheel cutter shall be used when practicable. Copper tubing shall be cut square and all burrs shall be removed. Squeeze type mechanical cutters shall not be used for ductile iron.

3.1.2 Adjacent Facilities

3.1.2.1 Sewer Lines

Where the location of the water pipe is not clearly defined in dimensions on the drawings, the water pipe shall not be laid closer horizontally than 10 feet from a sewer except where the bottom of the water pipe will be at least 12 inches above the top of the sewer pipe, in which case the water pipe shall not be laid closer horizontally than 6 feet from the sewer. Where water lines cross under gravity-flow sewer lines, the sewer pipe, for

a distance of at least 10 feet each side of the crossing, shall be fully encased in concrete or shall be made of pressure pipe with no joint located within 3 feet horizontally of the crossing. Water lines shall in all cases cross above sewage force mains or inverted siphons and shall be not less than 2 feet above the sewer main. Joints in the sewer main, closer horizontally than 3 feet to the crossing, shall be encased in concrete.

3.1.2.2 Water Lines

Water lines shall not be laid in the same trench with sewer lines, gas lines, fuel lines, or electric wiring.

3.1.2.3 Copper Tubing Lines

Copper tubing shall not be installed in the same trench with ferrous piping materials.

3.1.2.4 Nonferrous Metallic Pipe

Where nonferrous metallic pipe, e.g. copper tubing, crosses any ferrous piping material, a minimum vertical separation of 12 inchesshall be maintained between pipes.

3.1.2.5 Casing Pipe

Water pipe shall be encased in a sleeve of rigid conduit for the lengths shown. Sleeves under railroads shall be in accordance with [the [_____] railroad company requirements] [the criteria contained in AREMA Manual, Part 5]. Where sleeves are required, in all other cases, the pipe sleeve shall be [steel, manufactured in accordance with AWWA C200, ASTM A 36/A 36M, [_____], with a minimum wall thickness of [_____]] [reinforced concrete in accordance with and ASTM C 76, Class [V] [_____] as specified for storm drains in Section 02630 STORM-DRAINAGE SYSTEM]. A minimum clearance of at least 2 inches between the inner wall of the sleeve and the maximum outside diameter of the sleeved pipe and joints shall be provided. Sand bedding or suitable pipe support shall be provided for the water pipe through the sleeve. Sleeves of ferrous material shall be provided with corrosion protection as required in Section [13110 CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE)] [_____].

3.1.2.6 Structures

Where water pipe is required to be installed within 3 feet of existing structures, the water pipe shall be sleeved as required in Paragraph "Casing Pipe". The Contractor shall install the water pipe and sleeve ensuring that there will be no damage to the structures and no settlement or movement of foundations or footings.

3.1.3 Joint Deflection

3.1.3.1 Allowable for Reinforced Concrete Pipe

Maximum allowable deflections from a straight line or grade, as required by vertical curves, horizontal curves, or offsets, shall be 5 degrees for reinforced concrete pipe unless a lesser amount is recommended by the manufacturer. Long radius curves in reinforced concrete pipe shall be formed by straight pipe in which spigot rings are placed on a bevel. Slight deflections may be made by straight pipe, provided that the maximum joint opening caused by such deflection does not exceed the maximum

recommended by the pipe manufacturer. Short radius curves and closures shall be formed by shorter lengths of pipe, bevels, or fabricated specials specified.

3.1.3.2 Offset for Flexible Plastic Pipe

Maximum offset in alignment between adjacent pipe joints shall be as recommended by the manufacturer and approved by the Contracting Officer, but shall not exceed 5 degrees.

3.1.3.3 Allowable for Ductile-Iron Pipe

The maximum allowable deflection shall be as given in AWWA C600. If the alignment requires deflection in excess of the above limitations, special bends or a sufficient number of shorter lengths of pipe shall be furnished to provide angular deflections within the limit set forth.

3.1.3.4 Allowable for Steel Pipe

For pipe with bell-and-spigot rubber-gasket joints, maximum allowable deflections from a straight line or grade, as required by vertical curves, horizontal curves, or offsets shall be 5 degrees unless a lesser amount is recommended by the manufacturer. Short-radius curves and closures shall be formed by short lengths of pipe or fabricated specials specified.

3.1.3.5 Allowable for RPMP Pipe

For pipe with bell and spigot rubber gasket joints, maximum allowable deflections from a straight line or grade shall be 4 degrees determined by the diameter, unless a lesser amount is recommended by the manufacturer. Short-radius curves and closures shall be formed by short lengths of pipe or fabricated specials specified.

3.1.4 Placing and Laying

Pipe and accessories shall be carefully lowered into the trench by means of derrick, ropes, belt slings, or other authorized equipment. Water-line materials shall not be dropped or dumped into the trench. Abrasion of the pipe coating shall be avoided. Except where necessary in making connections with other lines or as authorized by the Contracting Officer, pipe shall be laid with the bells facing in the direction of laying. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells, couplings, and joints. Pipe that has the grade or joint disturbed after laying shall be taken up and relaid. Pipe shall not be laid in water or when trench conditions are unsuitable for the work. Water shall be kept out of the trench until joints are complete. When work is not in progress, open ends of pipe, fittings, and valves shall be securely closed so that no trench water, earth, or other substance will enter the pipes or fittings. Where any part of the coating or lining is damaged, the repair shall be made by and at the Contractor's expense in a satisfactory manner. Pipe ends left for future connections shall be valved, plugged, or capped, and anchored, as shown.

3.1.4.1 Reinforced Concrete Pipe Installation

Reinforced concrete pipe shall be installed in accordance with recommendations of the pipe manufacturer. Before laying reinforced concrete pipe, the outside surface of the spigot and the inside surface of the bell shall be cleaned and an acceptable vegetable-compound lubricant

applied to the inside surface of the bell and to the rubber gasket. Where prescribed by the pipe manufacturer, the gasket shall be placed in the groove on the end of the pipe before the pipe is placed in the trench. After the pipe has been forced together, the position of the rubber gasket shall be checked with a feeler gauge in accordance with the pipe manufacturer's recommendations. Tapping of reinforced concrete cylinder pipe shall be done in accordance with the manufacturer's approved recommendations. Where the manufacturer recommends that the taps be made by attaching the rubber-gasketed saddle to the outside of the pipe using U-bolts, the saddle shall be grouted in if necessary, the mortar coating shall be chipped away, even with the hole in the saddle plate. The exposed circumferential wires shall be removed and the cylinder and concrete core drilled out, and the steel saddle and U-bolts shall be protected by concrete encasement.

3.1.4.2 Plastic Pipe Installation

RTRP shall be installed in accordance with ASTM D 3839. RPMP shall be installed in accordance with the manufacturer's recommendations. PE Pipe shall be installed in accordance with ASTM D 2774. PVC pipe shall be installed in accordance with AWWA M23.

3.1.4.3 Piping Connections

Where connections are made between new work and existing mains, the connections shall be made by using specials and fittings to suit the actual conditions. When made under pressure, these connections shall be installed using standard methods as approved by the Contracting Officer. Connections to existing asbestos-cement pipe shall be made in accordance with ACPPA 1344.

3.1.4.4 Penetrations

Pipe passing through walls of valve pits and structures shall be provided with ductile-iron or Schedule 40 steel wall sleeves. Annular space between walls and sleeves shall be filled with rich cement mortar. Annular space between pipe and sleeves shall be filled with mastic.

3.1.4.5 Flanged Pipe

Flanged pipe shall only be installed above ground or with the flanges in valve pits.

3.1.5 Jointing

3.1.5.1 Reinforced Concrete Pipe Requirements

The inside and outside annular spaces between abutting sections of concrete pipe shall be filled with rich cement mortar in accordance with the pipe manufacturer's recommendations. Excess mortar shall be removed from interior annular spaces, leaving a smooth and continuous surface between pipe sections. Exposed portions of steel joint rings shall be protected from corrosion by a metallic coating or by an approved nonmetallic coating. Rubber gaskets shall be handled, lubricated where necessary, and installed in accordance with the pipe manufacturer's recommendations.

3.1.5.2 PE Pipe Requirements

Jointing shall comply with ASTM D 2657, Technique I-Socket Fusion or Technique II-Butt Fusion.

3.1.5.3 PVC Plastic Pipe Requirements

a. Pipe less than 4 inch diameter: Threaded joints shall be made by wrapping the male threads with approved thread tape or applying an approved lubricant, then threading the joining members together. The joint shall be tightened using strap wrenches to prevent damage to the pipe and/or fitting. To avoid excessive torque, joints shall be tightened no more than one thread past hand-tight. Preformed rubber-ring gaskets for elastomeric-gasket joints shall be made in accordance with ASTM F 477 and as specified. Pipe ends for push-on joints shall be beveled to facilitate assembly and marked to indicate when the pipe is fully seated. The gasket shall be prelubricated to prevent displacement. The gasket and ring groove in the bell or coupling shall match. The manufacturer of the pipe or fitting shall supply the elastomeric gasket. Couplings shall be provided with stops or centering rings to assure that the coupling is centered on the joint. Solvent cement joints shall use sockets conforming to ASTM D 2467. The solvent cement used shall meet the requirements of ASTM D 2564; the joint assembly shall be made in accordance with ASTM D 2855 and the manufacturer's specific recommendations.

b. Pipe 4 through 12 inch diameter: Joints shall be elastomeric gasket as specified in AWWA C900. Jointing procedure shall be as specified for pipe less than 4 inch diameter with configuration using elastomeric ring gasket.

c. Pipe 14 through 36 inch diameter: Joints shall be elastomeric gasket push-on joints made in accordance with AWWA M23.

3.1.5.4 RTRP I, RTRP II and RPMP Pipe

a. RTRP I: Assembly of the pipe shall be done in conformance with the manufacturer's written instruction and installation procedures. Field joints shall be prepared as specified by the pipe manufacturer. Several pipe joints having interference-fit type couplings may be field bonded and cured simultaneously. However, the pipe shall not be moved and additional joints shall not be made until the previously laid joints are completely cured. Joints not having interference-fit type coupling shall be fitted with a clamp which shall hold the joint rigidly in place until the joint cement has completely cured. The clamps shall have a protective material on the inner surface to prevent damage to the plastic pipe when the clamp is tightened in place. The pipe manufacturer shall provide a device or method to determine when the joint is pulled against the pipe stop. Additionally, the pipe manufacturer shall furnish a gauge to measure the diameter of the spigot ends to ensure the diameter conforms to the tolerances specified by the manufacturer. All pipe ends shall be gauged. Factory certified tests shall have been satisfactorily performed to verify that short-term rupture strength is 1,500 psior greater when carried out in accordance with ASTM D 1599. At any ambient temperature, field bonded epoxy-cemented joints shall be cured with a self-regulating, thermostatically temperature controlled, electrical heating blanket for the time and temperature recommended by the manufacturer for the applicable size and type of joint, or by an alternate heating method recommended by the manufacturer and approved by the Contracting Officer. The joint

sections shall not be moved during heating, or until the joint has cooled to ambient temperature.

b. RTRP II: A reinforced overlay joint shall be used to join sections together through a placement of layers of reinforcement fiberglass roving, mat, tape or fabric thoroughly saturated with compatible catalyzed resin.

c. RPMP: Bell and spigot gasket-sealing coupling shall be used to connect pipes. The spigot shall be lubricated prior to push-together assembly.

d. Fittings and Specials for RTRP and RPMP Pipe: Metal to RTRP and RPMP pipe connections shall be made by bolting steel flanges to RTRP and RPMP pipe flanges. Cast-iron fitting with gasket bell or mechanical joint may be used with RTRP if pipe has cast iron outside diameter. Steel flanges shall be flat-faced type. Where raised-face steel flanges are used, spacer rings shall be used to provide a flat-face seat for RTRP and RPMP pipe flanges. A full-face Buna "N" gasket 1/8 inch thick with a shore hardness of 50-60 shall be used between all flanged connections. The RTRP and RPMP pipe flange shall have raised sealing rings. Flat washers shall be used under all nuts and bolts on RTRP and RPMP pipe flanges. Bolts and nuts shall be of noncorrosive steel and torqued to not more than 100 foot pounds.Flanges shall not be buried. A concrete pit shall be provided for all flanged connections.

3.1.5.5 Ductile-Iron Pipe Requirements

Mechanical and push-on type joints shall be installed in accordance with AWWA C600 for buried lines or AWWA C606 for grooved and shouldered pipe above ground or in pits.

3.1.5.6 Not Galvanized Steel Pipe Requirements

a. Mechanical Couplings: Mechanical couplings shall be installed in accordance with the recommendations of the couplings manufacturer.

b. Rubber Gaskets: Rubber gaskets shall be handled, lubricated where necessary, and installed in accordance with the pipe manufacturer's recommendations.

3.1.5.7 Galvanized Steel Pipe Requirements

Screw joints shall be made tight with a stiff mixture of graphite and oil, inert filler and oil, or with an approved graphite compound, applied with a brush to the male threads only. Compounds shall not contain lead.

3.1.5.8 Copper Tubing Requirements

Joints shall be made with flared fittings. The flared end tube shall be pulled tightly against the tapered part of the fitting by a nut which is part of the fitting, so there is metal-to-metal contact.

3.1.5.9 Bonded Joints Requirements

Bonded joints shall be installed in accordance with details specified for joints in paragraph JOINTS.

3.1.5.10 Isolation Joints and Dielectric Fittings

Isolation joints and dielectric fittings shall be installed in accordance with details specified in paragraph JOINTS. Dielectric unions shall be encapsulated in a field-poured coal-tar covering, with at least 1/8 inch thickness of coal tar over all fitting surfaces.

3.1.5.11 Transition Fittings

Connections between different types of pipe and accessories shall be made with transition fittings approved by the Contracting Officer.

3.1.6 Installation of Service Lines

Service lines shall include the pipeline connecting building piping to water distribution lines to the connections with the building service at a point approximately 5 feet outside the building where such building service exists. Where building services are not installed, the Contractor shall terminate the service lines approximately 5 feet from the site of the proposed building at a point designated by the Contracting Officer. Such service lines shall be closed with plugs or caps. All service stops and valves shall be provided with service boxes. Service lines shall be constructed in accordance with the following requirements:

3.1.6.1 Service Lines 50 mm (2 Inches) and Smaller

Service lines 2 inches and smaller shall be connected to the main by a directly-tapped corporation stop or by a service clamp. A corporation stop and a copper gooseneck shall be provided with either type of connection. Maximum sizes for directly-tapped corporation stops and for outlets with service clamps shall be as in TABLE I. Where 2 or more gooseneck connections to the main are required for an individual service, such connections shall be made with standard branch connections. The total clear area of the branches shall be at least equal to the clear area of the service which they are to supply.

TABLE I. SIZE OF CORPORATION STOPS AND OUTLET

Pipe Size Inches	Corporation Stops, Inches For Ductile-Iron Pipe	Outlets w/Service Clamps, Inches Single & Double Strap
3	--	1
4	1	1
6	1-1/4	1-1/2
8	1-1/2	2
10	1-1/2	2
12 & larger	2	2

NOTE:

a. Service lines 1-1/2 inches and smaller shall have a service stop.

b. Service lines 2 inches in size shall have a gate valve.

3.1.6.2 Service Lines Larger than 50 mm (2 Inches)

Service lines larger than 2 inches shall be connected to the main by a tapped saddle, tapping sleeve and valve, service clamp or reducing tee, depending on the main diameter and the service line diameter, and shall have a gate valve. Lines 3 inches and larger may use rubber-seated butterfly valves as specified above, or gate valves.

3.1.6.3 Service Lines for Sprinkler Supplies

Water service lines used to supply building sprinkler systems for fire protection shall be connected to the water distribution main in accordance with NFPA 24.

3.1.7 Field Coating and Lining of Pipe

3.1.7.1 Steel Pipe 80 mm (3 In.) and Larger, Not Galvanized

a. Cement-mortar coating and lining: Field jointing shall conform to Appendix, AWWA C205. Any defective area found in the coating and/or lining of pipe and joints shall be removed to the pipe wall and repaired. The repaired areas shall be at least equal in thickness to the minimum coating and/or lining required for the pipe. Steel reinforcement in the coating shall be repaired or replaced as necessary to assure a complete and soundly reinforced coating.

b. Coal-tar enamel coating, lining and wrapping: Field jointing shall conform to AWWA C203. The applied materials shall be tested by means of a spark-type electrical inspection device in accordance with the requirements of AWWA C203. Any flaws or holidays found in the coating and/or lining of pipe and joints shall be repaired by patching or other approved means. The repaired areas shall be at least equal in thickness to the minimum coating and/or lining required for the pipe.

3.1.7.2 Galvanized Steel Pipe, Field Coating

Field joints shall be given 1 coat of coal-tar primer and 2 coats of coal-tar enamel conforming to AWWA C203. The tests of the coating shall conform to AWWA C203, and any flaws or holidays found in the coating of pipe and joints shall be repaired by patching or other approved means; the repaired areas shall be at least equal in thickness to the minimum coating required for the pipe.

3.1.8 Setting of Fire Hydrants, Meters, Valves and Valve Boxes

3.1.8.1 Location of Fire Hydrants

Fire hydrants shall be located and installed as shown. Each hydrant shall be connected to the main with a 6 inch branch line having at least as much cover as the distribution main. Hydrants shall be set plumb with pumper nozzle facing the roadway, with the center of the lowest outlet not less than 18 inches above the finished surrounding grade, and the operating nut not more than 48 inches above the finished surrounding grade. Fire hydrants designated on the drawings as low profile shall have the lowest

outlet not less than 18 inches above the finished surrounding grade, the top of the hydrant not more than 24 inches above the finished surrounding grade. Except where approved otherwise, the backfill around hydrants shall be thoroughly compacted to the finished grade immediately after installation to obtain beneficial use of the hydrant as soon as practicable. The hydrant shall be set upon a slab of concrete not less than 4 inches thick and 15 inchessquare. Not less than 7 cubic feet of free-draining broken stone or gravel shall be placed around and beneath the waste opening of dry barrel hydrants to ensure drainage.

3.1.8.2 Location of Meters

[Meters and meter boxes] [Vaults] shall be installed at the locations shown on the drawings. The meters shall be centered in the [boxes] [vaults] to allow for reading and ease of removal or maintenance.

3.1.8.3 Location of Valves

After delivery, valves, including those in hydrants, shall be drained to prevent freezing and shall have the interiors cleaned of all foreign matter before installation. Stuffing boxes shall be tightened and hydrants and valves shall be fully opened and fully closed to ensure that all parts are in working condition. Check, pressure reducing, vacuum, and air relief valves shall be installed in valve pits. Valves and valve boxes shall be installed where shown or specified, and shall be set plumb. Valve boxes shall be centered on the valves. Boxes shall be installed over each outside gate valve unless otherwise shown. Where feasible, valves shall be located outside the area of roads and streets. Earth fill shall be tamped around each valve box or pit to a distance of 4 feet on all sides of the box, or the undisturbed trench face if less than 4 feet.

3.1.8.4 Location of Service Boxes

Where water lines are located below paved streets having curbs, the boxes shall be installed directly back of the curbs. Where no curbing exists, service boxes shall be installed in accessible locations, beyond the limits of street surfacing, walks and driveways.

3.1.9 Tapped Tees and Crosses

Tapped tees and crosses for future connections shall be installed where shown.

3.1.10 Thrust Restraint

Plugs, caps, tees and bends deflecting 11.25 degrees or more, either vertically or horizontally, on waterlines 4 inches in diameter or larger, and fire hydrants shall be provided with thrust restraints. Valves shall be securely anchored or shall be provided with thrust restraints to prevent movement. Thrust restraints shall be either thrust blocks or, for ductile-iron pipes, restrained joints.

3.1.10.1 Thrust Blocks

Thrust blocking shall be concrete of a mix not leaner than: 1 cement, 2-1/2 sand, 5 gravel; and having a compressive strength of not less than 2,000 psi after 28 days. Blocking shall be placed between solid ground and the hydrant or fitting to be anchored. Unless otherwise indicated or directed, the base and thrust bearing sides of thrust blocks shall be

poured directly against undisturbed earth. The sides of thrust blocks not subject to thrust may be poured against forms. The area of bearing shall be as shown or as directed. Blocking shall be placed so that the fitting joints will be accessible for repair. Steel rods and clamps, protected by galvanizing or by coating with bituminous paint, shall be used to anchor vertical down bends into gravity thrust blocks.

3.1.10.2 Restrained Joints

For ductile-iron pipe, restrained joints shall be designed by the Contractor or the pipe manufacturer in accordance with DIPRA TRD.

3.2 HYDROSTATIC TESTS

Where any section of a water line is provided with concrete thrust blocking for fittings or hydrants, the hydrostatic tests shall not be made until at least 5 days after installation of the concrete thrust blocking, unless otherwise approved.

3.2.1 Pressure Test

After the pipe is laid, the joints completed, fire hydrants permanently installed, and the trench partially backfilled leaving the joints exposed for examination, the newly laid piping or any valved section of piping shall, unless otherwise specified, be subjected for 1 hour to a hydrostatic pressure test of [200] [_____] psi. Water supply lines designated on the drawings shall be subjected for 1 hour to a hydrostatic pressure test of [200] [_____] psi. Each valve shall be opened and closed several times during the test. Exposed pipe, joints, fittings, hydrants, and valves shall be carefully examined during the partially open trench test. Joints showing visible leakage shall be replaced or remade as necessary. Cracked or defective pipe, joints, fittings, hydrants and valves discovered in consequence of this pressure test shall be removed and replaced with sound material, and the test shall be repeated until the test results are satisfactory. The requirement for the joints to remain exposed for the hydrostatic tests may be waived by the Contracting Officer when one or more of the following conditions is encountered:

a. Wet or unstable soil conditions in the trench.

b. Compliance would require maintaining barricades and walkways around and across an open trench in a heavily used area that would require continuous surveillance to assure safe conditions.

c. Maintaining the trench in an open condition would delay completion of the project.

The Contractor may request a waiver, setting forth in writing the reasons for the request and stating the alternative procedure proposed to comply with the required hydrostatic tests. Backfill placed prior to the tests shall be placed in accordance with the requirements of Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

3.2.2 Leakage Test

Leakage test shall be conducted after the pressure tests have been satisfactorily completed. The duration of each leakage test shall be at least 2 hours, and during the test the water line shall be subjected to not less than [200] [_____] psi pressure. Water supply lines designated on the

drawings shall be subjected to a pressure equal to [200] [_____] psi. Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved or approved section, necessary to maintain pressure within 5 psi of the specified leakage test pressure after the pipe has been filled with water and the air expelled. Piping installation will not be accepted if leakage exceeds the allowable leakage which is determined by the following formula:

L = 0.0001351ND(P raised to 0.5 power)

L = Allowable leakage in gallons per hour
N = Number of joints in the length of pipeline tested
D = Nominal diameter of the pipe in inches
P = Average test pressure during the leakage test, in psi gauge

Should any test of pipe disclose leakage greater than that calculated by the above formula, the defective joints shall be located and repaired until the leakage is within the specified allowance, without additional cost to the Government.

3.2.3 Time for Making Test

Except for joint material setting or where concrete thrust blocks necessitate a 5-day delay, pipelines jointed with rubber gaskets, mechanical or push-on joints, or couplings may be subjected to hydrostatic pressure, inspected, and tested for leakage at any time after partial completion of backfill. Cement-mortar lined pipe may be filled with water as recommended by the manufacturer before being subjected to the pressure test and subsequent leakage test.

3.2.4 Concurrent Hydrostatic Tests

The Contractor may elect to conduct the hydrostatic tests using either or both of the following procedures. Regardless of the sequence of tests employed, the results of pressure tests, leakage tests, and disinfection shall be as specified. Replacement, repair or retesting required shall be accomplished by the Contractor at no additional cost to the Government.

a. Pressure test and leakage test may be conducted concurrently.

b. Hydrostatic tests and disinfection may be conducted concurrently, using the water treated for disinfection to accomplish the hydrostatic tests. If water is lost when treated for disinfection and air is admitted to the unit being tested, or if any repair procedure results in contamination of the unit, disinfection shall be reaccomplished.

3.3 BACTERIALDISINFECTION

3.3.1 Bacteriological Disinfection

Before acceptance of potable water operation, each unit of completed waterline shall be disinfected [as prescribed by AWWA C651.] [as specified. After pressure tests have been made, the unit to be disinfected shall be thoroughly flushed with water until all entrained dirt and mud have been removed before introducing the chlorinating material. The chlorinating material shall be either liquid chlorine, calcium hypochlorite, or sodium hypochlorite, conforming to paragraph MISCELLANEOUS ITEMS. The chlorinating material shall provide a dosage of not less than 50 ppm and

shall be introduced into the water lines in an approved manner. Polyvinyl Chloride (PVC) pipe lines shall be chlorinated using only the above specified chlorinating material in solution. The agent shall not be introduced into the line in a dry solid state. The treated water shall be retained in the pipe long enough to destroy all non-spore forming bacteria. Except where a shorter period is approved, the retention time shall be at least 24 hours and shall produce not less than 25 ppm of free chlorine residual throughout the line at the end of the retention period. Valves on the lines being disinfected shall be opened and closed several times during the contact period. The line shall then be flushed with clean water until the residual chlorine is reduced to less than 1.0 ppm. During the flushing period, each fire hydrant on the line shall be opened and closed several times.] From several points in the unit, [the Contracting Officer will take samples of water in proper sterilized containers for bacterial examination.] [personnel from the Contractor's commercial laboratory shall take at least [3] [_____] water samples from different points, approved by the Contracting Officer, in proper sterilized containers and perform a bacterial examination in accordance with state approved methods. The commercial laboratory shall be certified by the state's approving authority for examination of potable water.] The disinfection shall be repeated until tests indicate the absence of pollution for at least 2 full days. The unit will not be accepted until satisfactory bacteriological results have been obtained.

3.4 CLEANUP

Upon completion of the installation of water lines, and appurtenances, all debris and surplus materials resulting from the work shall be removed.

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SECTION 02530

SANITARY SEWERS
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN CONCRETE PIPE ASSOCIATION (ACPA)

ACPA 01-102	(1988) Concrete Pipe Handbook
ACPA 01-103	(1995) Concrete Pipe Installation Manual

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI B18.5.2.1M	(1981; R 1995) Metric Round Head Short Square Neck Bolts

AMERICAN RAILWAY ENGINEERING & MAINTENANCE-OF-WAY ASSOCIATION (AREMA)

AREMA 1-5	(2001) Pipelines

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 123/A 123M	(2001a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 307	(2000) Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
ASTM A 47	(1999) Ferritic Malleable Iron Castings **
ASTM A 47M	(1990; R 1996) Ferritic Malleable Iron Castings (Metric) **
ASTM A 48	(1994ae1) Gray Iron Castings **
ASTM A 48M	(1994e1) Gray Iron Castings (Metric) **
ASTM A 536	(1984; R 1999e1) Ductile Iron Castings
ASTM A 563	(2000) Carbon and Alloy Steel Nuts
ASTM A 563M	(2001) Carbon and Alloy Steel Nuts (Metric)
ASTM A 74	(1998) Cast Iron Soil Pipe and Fittings
ASTM A 746	(1999) Ductile Iron Gravity Sewer Pipe
ASTM C 12	(2002) Installing Vitrified Clay Pipe Lines

ASTM C 14	(1999) Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C 14M	(1999) Concrete Sewer, Storm Drain, and Culvert Pipe (Metric)
ASTM C 150	(2002) Portland Cement
ASTM C 260	(2001) Air-Entraining Admixtures for Concrete
ASTM C 270	(2001a) Mortar for Unit Masonry
ASTM C 33	(2001a) Concrete Aggregates
ASTM C 361	(1999) Reinforced Concrete Low-Head Pressure Pipe
ASTM C 361M	(1999) Reinforced Concrete Low-Head Pressure (Metric)
ASTM C 425	(2002) Compression Joints for Vitrified Clay Pipe and Fittings
ASTM C 443	(2001) Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
ASTM C 443M	(2001) Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets (Metric)
ASTM C 478	(1997) Precast Reinforced Concrete Manhole Sections
ASTM C 478M	(1997) Precast Reinforced Concrete Manhole Sections (Metric)
ASTM C 564	(1997) Rubber Gaskets for Cast Iron Soil Pipe and Fittings
ASTM C 700	(2002) Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated
ASTM C 76	(2000) Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C 76M	(2000) Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe (Metric)
ASTM C 828	(2001) Low-Pressure Air Test of Vitrified Clay Pipe Lines
ASTM C 923	(2000) Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals
ASTM C 923M	(1998) Resilient Connectors Between Reinforced Concrete Manhole Structures,

	Pipes and Laterals (Metric)
ASTM C 924	(1989; R 1997) Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method
ASTM C 924M	(1989; R 1998) Testing Concrete Pipe Sewer Liner by Low-Pressure Air Test Method (Metric)
ASTM C 94	(1994) Ready-Mixed Concrete **
ASTM C 94/C 94M	(2000e2) Ready-Mixed Concrete
ASTM C 969	(2000) Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines
ASTM C 969M	(2000) Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines (Metric)
ASTM C 972	(2000) Compression-Recovery of Tape Sealant
ASTM C 990	(2001a) Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealers
ASTM C 990M	(2001a) Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants (Metric)
ASTM D 1784	(1999a) Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D 1785	(1999) Poly(Vinyl Chloride)(PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D 2235	(2001) Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings
ASTM D 2241	(2000) Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
ASTM D 2321	(2000) Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D 2412	(1996a) Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
ASTM D 2464	(1999) Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D 2466	(2001) Poly(Vinyl Chloride)(PVC) Plastic Pipe Fittings, Schedule 40

ASTM D 2467	(2001) Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D 2680	(2001) Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping
ASTM D 2751	(1996a) Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings
ASTM D 2996	(2001) Filament-Wound "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
ASTM D 2997	(2001) Centrifugally Cast "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
ASTM D 3034	(2000) Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D 3139	(1998) Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
ASTM D 3212	(1996a) Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM D 3262	(2002) "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe
ASTM D 3350	(2002) Polyethylene Plastics Pipe and Fittings Materials
ASTM D 3753	(1999)Glass-Fiber-Reinforced Manholes
ASTM D 3840	(2001) "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Fittings for Nonpressure Applications
ASTM D 4101	(2002) Propylene Injection and Extrusion Materials
ASTM D 412	(1998a) Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension
ASTM D 4161	(2001) "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals
ASTM D 624	(2000) Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
ASTM F 402	(1993; R 1999) Safe Handling of Solvent Cements, Primers, and Cleaners Used for

	Joining Thermoplastic Pipe and Fittings
ASTM F 405	(1997) Corrugated Polyethylene (PE) Tubing and Fittings
ASTM F 477	(1999) Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F 714	(2001) Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
ASTM F 758	(1995; R 2000) Smooth-Wall Poly(Vinyl Chloride) (PVC) Plastic Underdrain Systems for Highway, Airport, and Similar Drainage
ASTM F 794	(1999) Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
ASTM F 894	(1998a) Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
ASTM F 949	(2001a) Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings

AMERICAN WATER WORKS ASSOCIATION(AWWA)

AWWA C104	(1995) Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
AWWA C105	(1999) Polyethylene Encasement for Ductile-Iron Pipe Systems
AWWA C110	(1998) Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (76 mm through 1219 mm), for Water
AWWA C111	(2000) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C115	(1999) Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges
AWWA C151	(1996) Ductile-Iron Pipe, Centrifugally Cast, for Water
AWWA C153	(2000) Ductile-Iron Compact Fittings for Water Service
AWWA C302	(1995) Reinforced Concrete Pressure Pipe, Noncylinder Type
AWWA C600	(1999) Installation of Ductile-Iron Water Mains and Their Appurtenances
AWWA C606	(1997) Grooved and Shouldered Joints
AWWA C900	(1997) Polyvinyl Chloride (PVC) Pressure

	Pipe, and Fabricated Fittings, 4 In. Through 12 In. (100 mm Through 300 mm), for Water Distribution
AWWA M23	(1980) Manual: PVC Pipe - Design and Installation
AWWA M9	(1995) Manual: Concrete Pressure Pipe

ASME INTERNATIONAL (ASME)

ASME B1.20.1	(1983; R 2001) Pipe Threads, General Purpose, Inch
ASME B16.1	(1998) Cast Iron Pipe Flanges and Flanged Fittings
ASME B18.2.2	(1987; R 1999) Square and Hex Nuts
ASME B18.5.2.2M	(1982; R 2000) Metric Round Head Square Neck Bolts

CAST IRON SOIL PIPE INSTITUTE (CISPI)

CISPI 301	(2000) Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications
CISPI 310	(1997) Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS A-A-60005	(1998) Frames, Covers, Gratings, Steps, Sump and Catch Basin, Manhole ++

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.27	Fixed Ladders

UNI-BELL PVC PIPE ASSOCIATION (UBPPA)

UBPPA UNI-B-3	(1992) Recommended Practice for the Installation of Polyvinyl Chloride (PVC) Pressure Pipe (Nominal Diameters 4-36 Inch)
UBPPA UNI-B-6	(1990) Recommended Practice for the Low-Pressure Air Testing of Installed Sewer Pipe

1.2 SYSTEM DESCRIPTION

1.2.1 Sanitary Sewer Gravity Pipeline

[Provide [mains and laterals] [[_____] inch lines] of [clay pipe] [concrete pipe] [ductile-iron pipe] [acrylonitrile-butadiene-styrene (ABS) composite plastic pipe] [or] [polyvinyl chloride (PVC) plastic pipe] [at the

Contractor's option]. Provide building connections [[_____] inch lines] of [cast iron soil pipe] [clay pipe] [concrete pipe] [acrylonitrile-butadiene-styrene (ABS) solid-wall plastic pipe] [or] [polyvinyl chloride (PVC) plastic pipe] at the Contractor's option.]

[Provide new and modify existing exterior sanitary gravity sewer piping and appurtenances. Provide each system complete and ready for operation. The exterior sanitary gravity sewer system includes equipment, materials, installation, and workmanship as specified herein more than 5 feet outside of building walls.]

1.2.2 Sanitary Sewer Pressure Lines

Provide pressure lines of [ductile iron pressure pipe] [concrete pressure pipe] [or] [polyvinyl chloride (PVC) plastic pressure pipe] [at the Contractor's option].

1.3 GENERAL REQUIREMENTS

The construction required herein shall include appurtenant structures and building sewers to points of connection with the building drains 5 feet outside the building to which the sewer system is to be connected. The Contractor shall replace damaged material and redo unacceptable work at no additional cost to the Government. Excavation and backfilling is specified in Section 02316A EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS. Backfilling shall be accomplished after inspection by the Contracting Officer. Force mains and inverted siphons are specified in Section 02532A FORCE MAINS AND INVERTED SIPHONS; SEWER. Before, during, and after installation, plastic pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions unless directed otherwise by the Contracting Officer. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install the plastic pipe shall be stored in accordance with the manufacturer's recommendation and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Precast concrete manhole

Metal items

Frames, covers, and gratings

SD-03 Product Data

Pipeline materials including joints, fittings, and couplings

Submit manufacturer's standard drawings or catalog cuts.

SD-07 Certificates

Portland Cement; [_____], [_____]

Certificates of compliance stating the type of cement used in manufacture of concrete pipe, fittings and precast manholes.

Joints; [_____], [_____]

Certificates of compliance stating that the fittings or gaskets used for waste drains or lines designated on the plans as [_____] are [oil] [_____] resistant.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery and Storage

1.5.1.1 Piping

Inspect materials delivered to site for damage; store with minimum of handling. Store materials on site in enclosures or under protective coverings. Store [plastic piping and jointing materials and] rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

1.5.1.2 Metal Items

Check upon arrival; identify and segregate as to types, functions, and sizes. Store off the ground in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.

1.5.1.3 Cement, Aggregate, and Reinforcement

As specified in Section 03300N, "Cast-In-Place Concrete."

1.5.2 Handling

Handle pipe, fittings, and other accessories in such manner as to ensure delivery to the trench in sound undamaged condition. [Take special care not to damage linings of pipe and fittings; if lining is damaged, make satisfactory repairs.] Carry, do not drag, pipe to trench.

PART 2 PRODUCTS

2.1 PIPELINE MATERIALS

Pipe shall conform to the respective specifications and other requirements specified below.

2.1.1 Cast-Iron Soil Piping

2.1.1.1 Cast-Iron Hub and Spigot Soil Pipe and Fittings

ASTM A 74, [service] [extra heavy], with ASTM C 564 compression-type rubber

gaskets.

2.1.1.2 Cast-Iron Hubless Soil Pipe and Fittings

CISPI 301 with CISPI 310 coupling joints.

2.1.2 Clay Piping

2.1.2.1 Clay Pipe and Fittings

ASTM C 700, [standard strength] [extra strength] [bell-and-spigot piping only].

2.1.2.2 Clay Piping Jointing Materials

ASTM C 425.

2.1.3 Concrete Gravity Sewer Piping

2.1.3.1 Concrete Gravity Pipe and Fittings

Pipe shall be [nonreinforced concrete pipe conforming to ASTM C 14, Class [_____]] [reinforced concrete pipe conforming to ASTM C 76, Class [_____]]. Circular pipe with elliptical reinforcement shall have a readily visible line at least 12 inches long painted or otherwise applied on the inside and outside of the pipe at each end so that when the pipe is laid in the proper position, the line will be at the center of the top of the pipe. Fittings and specials shall conform to the applicable requirements specified for the pipe and shall be of the same strength as the pipe. [Cement used in manufacturing pipe and fittings shall be [Type II] [Type V] [low alkali cement] conforming to ASTM C 150.]

2.1.3.2 Jointing Materials for Concrete Gravity Piping

Gaskets and pipe ends for rubber gasket joint shall conform to ASTM C 443. Gaskets shall be suitable for use with sewage.

2.1.4 Concrete Pressure Piping

2.1.4.1 Concrete Pressure Pipe and Fittings

Pipe shall conform to [AWWA C302 or to] ASTM C 361. Pipe shall be designed for hydrostatic head of [100] [125] feet and external loading of [5] [10] [15] [20] feet of earth cover. Circular pipe with elliptical reinforcement shall have a readily visible line at least 12 inches long painted or otherwise applied on the inside and outside of the pipe at each end so that when the pipe is laid in the proper position, the line will be at the center of the top of the pipe. [Cement used in manufacturing pipe and fittings shall be [Type II] [Type V] [low alkali cement] conforming to ASTM C 150.] Fittings shall conform to AWWA C302.

2.1.4.2 Jointing Materials for Concrete Pressure Piping

Gaskets shall be as specified in [the referenced specification for the pipe] [ASTM C 361] and shall be suitable for use with sewage.

2.1.5 Ductile Iron Gravity Sewer Pipe and Associated Fittings

2.1.5.1 Ductile Iron Gravity Pipe and Fittings

Ductile iron pipe shall conform to ASTM A 746, Thickness Class [_____]. Fittings shall conform to AWWA C110 or AWWA C153. [Fittings with push-on joint ends shall conform to the same requirements as fittings with mechanical-joint ends, [except that the bell design shall be modified, as approved by the Contracting Officer, for push-on joint].] Fittings shall have strength at least equivalent to that of the pipe. Ends of pipe and fittings shall be suitable for the joints specified hereinafter. Pipe and fittings shall have cement-mortar lining conforming to AWWA C104, standard thickness.

2.1.5.2 Ductile Iron Gravity Joints and Jointing Materials

Pipe and fittings shall have [push-on joints] [or] [mechanical joints], except as otherwise specified in this paragraph. [Mechanical joints only shall be used where indicated.] [Push-on joint pipe ends and fitting ends, gaskets, and lubricant for joint assembly shall conform to AWWA C111.] [Mechanical joint requirements for pipe ends, glands, bolts and nuts, and gaskets shall conform to AWWA C111.]

2.1.6 Ductile Iron Pressure Piping

2.1.6.1 Ductile Iron Pressure Pipe and Fittings

Ductile-iron pipe shall conform to AWWA C151, Thickness Class [_____]. [Flanged pipe shall conform to AWWA C115.] Fittings shall conform to AWWA C110 or AWWA C153. [Fittings with push-on joint ends shall conform to the same requirements as fittings with mechanical-joint ends, except that the bell design shall be modified, as approved, for push-on joint.] Fittings shall have pressure rating at least equivalent to that of the pipe. Ends of pipe and fittings shall be suitable for the joints specified hereinafter. Pipe and fittings shall have cement-mortar lining conforming to AWWA C104, standard thickness.

2.1.6.2 Ductile Iron Pressure Joints and Jointing Materials

a. Joints, general: Joints for pipe and fittings shall be [push-on joints] [or] [mechanical joints] except as otherwise specified in this paragraph. [Joints shall be mechanical-joints where indicated.] [Joints shall be flanged joints where indicated.] [Joints made with sleeve-type mechanical coupling may be used in lieu of push-on joint.] [[Grooved] [or] [shouldered] type joints may be used in lieu of push-on joint [or flanged joint], except where joint is buried.]

b. Push-on joints: Shape of pipe ends and fitting ends, gaskets, and lubricant for joint assembly shall conform to AWWA C111.

c. Mechanical joints: Dimensional and material requirements for pipe ends, glands, bolts and nuts, and gaskets shall conform to AWWA C111.

d. Flanged joints: Bolts, nuts, and gaskets for flanged connections shall be as recommended in the Appendix to AWWA C115. Flange for setscrewed flanges shall be of ductile iron, ASTM A 536, Grade 65-45-12, and shall conform to the applicable requirements of ASME B16.1, Class 250. Setscrews for setscrewed flanges shall be 190,000 psi tensile strength, heat treated, and zinc-coated steel. Gasket for setscrewed flanges shall conform to the applicable

requirements for mechanical-joint gaskets specified in AWWA C111. Design of setscrewed gasket shall provide for confinement and compression of gasket when joint to adjoining flange is made.

e. Joints made with sleeve-type mechanical couplings: Couplings shall be designed to couple plain-end piping by compression of a ring gasket at each end of the adjoining pipe sections. The coupling shall consist of one middle ring flared or beveled at each end to provide a gasket seat, two follower rings, two resilient tapered rubber gaskets, and bolts and nuts to draw the follower rings toward each other to compress the gaskets. The middle ring and the follower rings shall be true circular sections free from irregularities, flat spots, and surface defects; the design shall provide for confinement and compression of the gaskets. Middle ring shall be of cast-iron [or steel], and the follower rings shall be of malleable iron or ductile iron. Cast iron shall conform to ASTM A 48 and shall be not less than Class 25. Malleable iron shall conform to ASTM A 47. Ductile iron shall conform to ASTM A 536. [Steel shall have a strength not less than that of the pipe.] Gaskets shall be designed for long life and resistance to set after installation and shall meet the applicable requirements specified for gaskets for mechanical joint in AWWA C111. Bolts shall be track-head type; bolts and nuts shall be either of the following: bolts conforming to the tensile requirements of ASTM A 307, Grade A, with nuts conforming to the tensile requirements of ASTM A 563, Grade A; or round-head square-neck type bolts conforming to ANSI B18.5.2.1M and ASME B18.5.2.2M with hex nuts conforming to ASME B18.2.2. Bolts shall be 5/8 inch in diameter; minimum number of bolts for each coupling shall be [_____] [for [_____] inch pipe [,[_____] for [_____] inch pipe,] and [_____] for [_____] inch pipe]. Bolt holes in follower rings shall be of a shape to hold fast the necks of the bolts used. Sleeve-type mechanical couplings shall not be used as an optional method of jointing except where pipeline is adequately anchored to resist tension pull across the joint.

f. [Grooved] [and] [Shouldered] Type Joints: [Grooved pipe ends] [Shouldered pipe ends] and couplings shall conform to AWWA C606. Joint dimensions shall be as specified in AWWA C606 for rigid joints.

2.1.7 ABS Composite Plastic Piping

2.1.7.1 ABS Composite Plastic Pipe and Fittings

ASTM D 2680.

2.1.7.2 Jointing Materials for ABS Composite Plastic Piping

Solvent cement and primer shall conform to ASTM D 2680.

2.1.8 ABS Solid-Wall Plastic Piping

2.1.8.1 ABS Solid-Wall Plastic Pipe and Fittings

ASTM D 2751, SDR 35, with ends suitable for either solvent cement joints or elastomer joints.

2.1.8.2 ABS Solid-Wall Plastic Joints and Jointing Materials

Solvent cement for solvent cement joints shall conform to ASTM D 2235. Elastomeric joints shall conform to ASTM D 3212. Gaskets for elastomeric joints shall conform to ASTM F 477.

2.1.9 PVC Plastic Gravity Sewer Piping

2.1.9.1 PVC Plastic Gravity Pipe and Fittings

[ASTM D 3034, SDR 35, or ASTM F 949 with ends suitable for elastomeric gasket joints.] [ASTM F 794, Series 46, for ribbed sewer pipe with smooth interior, size 8 inch through 48 inch diameters.]

2.1.9.2 PVC Plastic Gravity Joints and Jointing Material

Joints shall conform to ASTM D 3212. Gaskets shall conform to ASTM F 477.

2.1.10 PVC Plastic Pressure Pipe and Associated Fittings

2.1.10.1 PVC Plastic Pressure Pipe and Fittings

a. Pipe and Fittings Less Than 4 inch Diameter: Pipe, couplings and fittings shall be manufactured of materials conforming to ASTM D 1784, Class 12454B.

(1) Screw-Joint: Pipe shall conform to dimensional requirements of ASTM D 1785, Schedule 80, with joints meeting requirements of 150 psi working pressure, 200 psihydrostatic test pressure, unless otherwise shown or specified. Fittings for threaded pipe shall conform to requirements of ASTM D 2464, threaded to conform to the requirements of ASME B1.20.1 for use with Schedule 80 pipe and fittings. Pipe couplings when used, shall be tested as required by ASTM D 2464.

(2) Push-On Joint: ASTM D 3139, with ASTM F 477 gaskets. Fittings for push-on joints shall be iron conforming to AWWA C110 or AWWA C111. Iron fittings and specials shall shall be cement-mortar lined (standard thickness) in accordance with AWWA C104.

(3) Solvent Cement Joint: Pipe shall conform to dimensional requirements of ASTM D 1785 or ASTM D 2241 with joints meeting the requirements of 150 psiworking pressure and 200 psi hydrostatic test pressure. Fittings for solvent cement jointing shall conform to ASTM D 2466 or ASTM D 2467.

b. Pipe and Fittings 4 inch Diameter to 12 inch: Pipe shall conform to AWWA C900 and shall be plain end or gasket bell end, Pressure Class 150 (DR 18), with cast-iron-pipe-equivalent OD. Fittings shall be gray-iron or ductile-iron conforming to AWWA C110 or AWWA C153 and shall have cement-mortar lining conforming to AWWA C104, standard thickness. Fittings with push-on joint ends shall conform to the same requirements as fittings with mechanical-joint ends, except that bell design shall be modified, as approved, for push-on joint suitable for use with the PVC plastic pressure pipe specified in this paragraph.

2.1.10.2 PVC Plastic Pressure Joints and Jointing Material

Joints for pipe, 4 inch to 12 inchdiameter, shall be push-on joints as specified in ASTM D 3139. Joints between pipe and fittings shall be push-on joints as specified in ASTM D 3139 or shall be compression-type joints/mechanical-joints as respectively specified in ASTM D 3139 and AWWA C111. Each joint connection shall be provided with an elastomeric gasket suitable for the bell or coupling with which it is to be used. Gaskets for push-on joints for pipe shall conform to ASTM F 477. Gaskets for push-on joints and compression-type joints/mechanical-joints for joint connections between pipe and fittings shall be as specified in AWWA C111, respectively, for push-on joints and mechanical-joints.

2.1.11 High Density Polyethylene Pipe

ASTM F 894, Class 63, size 18 inch through 120 inch. ASTM F 714, size 4 inch through 48 inch. The polyethylene shall be certified by the resin producer as meeting the requirements of ASTM D 3350, cell Class 334433C. The pipe stiffness shall be greater than or equal to 1170/D for cohesionless material pipe trench backfills. Fittings for High Density Polyethylene Pipe: ASTM F 894. Joints for high density polyethylene pipe: Rubber gasket joints shall conform to ASTM C 443.

2.1.12 Reinforced Plastic Mortar Pipe (RPMP)

Reinforced plastic mortar pipe shall be produced by centrifugal casting and shall have an outside diameter equal to dectile iron pipe dimensions from 18 inch to 48 inch. The inner surface of the pipe shall have a smooth uniform continuous resin-rich surface liner. The minimum pipe stiffness shall be 36 psi. RPMP shall be in accordance with ASTM D 3262. Fittings for RPMP: ASTM D 3840. Joints for RPMP: Bell and spigot gasket coupling utilizing an elastomeric gasket in accordance with ASTM D 4161 and ASTM F 477.

2.1.13 Reinforced Thermosetting Resin Pipe (RTRP)

RTRP pipe: ASTM D 3262. Fittings for RTRP: ASTM D 3262. Joints for RTRP: Bell and spigot type utilizing an elastomeric gasket in accordance with ASTM F 477.

2.1.13.1 Filament Wound RTRP-I

RTRP-I shall conform to ASTM D 2996, except pipe shall have an outside diameter equal to cast iron outside diameter or standard weight steel pipe. The pipe shall be suitable for a normal working pressure of 150 psi at 73 degrees F.The inner surface of the pipe shall have a smooth uniform continuous resin-rich surface liner conforming to ASTM D 2996.

2.1.13.2 Centrifugally Cast RTRP-II

RTRP-II shall conform to ASTM D 2997. Pipe shall have an outside diameter equal to standard weight steel pipe.

2.1.14 Piping Beneath Railroad Right-of-Way

Where pipeline passes under the right-of-way of a commercial railroad, piping shall conform to the specifications for pipelines conveying nonflammable substances in AREMA 1-5, except as otherwise specified in this paragraph. For casing pipe provide ductile-iron pipe in lieu of cast-iron soil pipe. Ductile-iron pipe shall conform to and have strength computed in accordance with ASTM A 746.

2.2 CONCRETE MATERIALS

2.2.1 Cement Mortar

Cement mortar shall conform to ASTM C 270, Type M with Type II cement.

2.2.2 Portland Cement

Portland cement shall conform to ASTM C 150, Type [II] [V] for concrete used in concrete pipe, concrete pipe fittings, and manholes and type optional with the Contractor for cement used in concrete cradle, concrete encasement, and thrust blocking. [Air-entraining admixture conforming to ASTM C 260 shall be used with Type V cement.] [Where aggregates are alkali reactive, as determined by Appendix XI of ASTM C 33, a cement containing less than 0.60 percent alkalies shall be used.]

2.2.3 Portland Cement Concrete

Portland cement concrete shall conform to ASTM C 94/C 94M, compressive strength of 4000 psi at 28 days, except for concrete cradle and encasement or concrete blocks for manholes. Concrete used for cradle and encasement shall have a compressive strength of 2500 psiminimum at 28 days. Concrete in place shall be protected from freezing and moisture loss for 7 days. Text

2.3 MISCELLANEOUS MATERIALS

2.3.1 Precast Concrete Manholes and Glass-Fiber-Reinforced Polyester Manholes.

Precast concrete manhole risers, base sections, and tops shall conform to ASTM C 478; base and first riser shall be monolithic.
Glass-Fiber-Reinforced Polyester Manholes shall conform to ASTM D 3753.

2.3.2 Gaskets and Connectors

Gaskets for joints between manhole sections shall conform to ASTM C 443. Resilient connectors for making joints between manhole and pipes entering manhole shall conform to ASTM C 923 or ASTM C 990.

2.3.3 External Preformed Rubber Joint Seals

An external preformed rubber joint seal shall be an accepted method of sealing cast iron covers to precast concrete sections to prevent ground water infiltration into sewer systems. All finished and sealed manholes constructed in accordance with paragraph entitled "Manhole Construction" shall be tested for leakage in the same manner as pipelines as described in paragraph entitled "Leakage Tests." The seal shall be multi-section with a neoprene rubber top section and all lower sections made of Ethylene Proplene Di Monomer (EPDM) rubber with a minimum thickness of 60 mils. Each unit shall consist of a top and bottom section and shall have mastic on the bottom of the bottom section and mastic on the top and bottom of the top section. The mastic shall be a non-hardening butyl rubber sealant and shall seal to the cone/top slab of the manhole/catch basin and over the lip of the casting. Extension sections shall cover up to two more adjusting rings. Properties and valves are listed in the following tables:

[Properties, Test Methods and Minimum Values for Rubber used in Preformed Joint Seals

Physical Properties	Test Methods	EPDM	Neoprene	Butyl mastic
Tensile, psi	ASTM D 412	1840	2195	-
Elogation percent	ASTM D 412	553	295	350
Tear Resistance, ppi	ASTM D 624 (Die B)	280	160	-
Rebound, percent, 5 minutes	ASTM C 972 (mod.)	-	-	11
Rebound, percent, 2 hours	ASTM C 972	-	-	12]

2.3.4 Metal Items

2.3.4.1 Frames, Covers, and Gratings for Manholes

FS A-A-60005, cast iron; figure numbers shall be [as follows] [as indicated]:

a. Traffic manhole: Provide in paved areas.

Frame: Figure 1, Size 22A
Cover: Figure 8, Size 22A
Steps: Figure 19

b. Non-traffic manhole:

Frame: Figure 4, Size 22
Cover: Figure 12, Size 22
Steps: Figure 19

Frames and covers shall be cast iron, ductile iron or reinforced concrete. Cast iron frames and covers shall be as indicated or shall be of type suitable for the application, circular, without vent holes. The frames and covers shall have a combined weight of not less than 400 pounds. Reinforced concrete frames and covers shall be as indicated or shall conform to ASTM C 478 or ASTM C 478M. The word "Sewer" shall be stamped or cast into covers so that it is plainly visible.

2.3.4.2 Manhole Steps

[Zinc-coated steel] [as indicated] conforming to 29 CFR 1910.27. [As an option, plastic or rubber coating pressure-molded to the steel may be used. Plastic coating shall conform to ASTM D 4101, copolymer polypropylene. Rubber shall conform to ASTM C 443, except shore A durometer hardness shall be 70 plus or minus 5.] Aluminum steps or rungs will not be permitted. Steps are not required in manholes less than 4 feet deep.

2.3.4.3 Manhole Ladders

A steel ladder shall be provided where the depth of a manhole exceeds 12 feet. The ladder shall not be less than 16 inches in width, with 3/4 inch

diameter rungs spaced 12 inches apart. The two stringers shall be a minimum 3/8 inch thick and 2 inches wide. Ladders and inserts shall be galvanized after fabrication in conformance with ASTM A 123/A 123M.

2.3.4.4 Septic Tank Piping

Cast iron soil pipe and fittings.

2.3.4.5 Siphon for Septic Tank

Welded steel or close-grained cast iron free from flaws, of an approved standard design, and prompt and positive in action.

2.3.5 Sewage Absorption Field Materials

[Pipe shall be perforated bell-and-spigot clay pipe conforming to ASTM C 700, clay drain tile, perforated corrugated polyethylene tubing conforming to ASTM F 405. Covering for open joints in drain tile lines shall be asphalt-treated paper or asphalt-covered fibrous glass cloth. Wire for fastening covering to tile shall be No. 18 American Wire Gage, nonferrous metal composition.]

[Pipe shall be perforated bell-and-spigot clay pipe conforming to ASTM C 700, clay drain tile or PVC plastic pipe conforming to ASTM F 758. Covering for open joints in drain tile lines shall be asphalt-treated paper or asphalt-covered fibrous glass cloth. Wire for fastening covering to tile shall be No. 18 American Wire Gage, nonferrous metal composition.]

PART 3 EXECUTION

3.1 INSTALLATION OF PIPELINES AND APPURTENANT CONSTRUCTION

3.1.1 General Requirements for Installation of Pipelines

Apply except where specific exception is made in the following paragraphs entitled "Special Requirements."

3.1.1.1 Location

The work covered by this section shall terminate at a point approximately 5 feet from the building [, unless otherwise indicated]. [Where the location of the sewer is not clearly defined by dimensions on the drawings, do not lay sewer line closer horizontally than 10 feet to a water main or service line.] [Install pressure sewer lines beneath water lines only, with the top of the sewer line being at least 2 feet below bottom of water line.] [Where sanitary sewer lines pass above water lines, encase sewer in concrete for a distance of 10 feet on each side of the crossing, or substitute rubber-gasketed pressure pipe for the pipe being used for the same distance.] [Where sanitary sewer lines pass below water lines, lay pipe so that no joint in the sewer line will be closer than 3 feet, horizontal distance, to the water line.]

[a. Sanitary piping installation parallel with water line:

(1) Normal conditions: Sanitary piping or manholes shall be laid at least 10 feet horizontally from a water line whenever possible. The distance shall be measured edge-to-edge.

(2) Unusual conditions: When local conditions prevent a

horizontal separation of 10 feet, the sanitary piping or manhole may be laid closer to a water line provided that:

(a) The top (crown) of the sanitary piping shall be at least 18 inches below the bottom (invert) of the water main.

(b) Where this vertical separation cannot be obtained, the sanitary piping shall be constructed of AWWA-approved ductile iron water pipe pressure tested in place without leakage prior to backfilling.

(c) The sewer manhole shall be of watertight construction and tested in place.]

[b. Installation of sanitary piping crossing a water line:

(1) Normal conditions: Lay sanitary piping crossing water lines to provide a separation of at least 18 inches between the top of the sanitary piping and the bottom of the water line whenever possible.

(2) Unusual conditions: When local conditions prevent a vertical separation described above, use the following construction:

(a) Sanitary piping passing over or under water lines shall be constructed of AWWA-approved ductile iron water pipe, pressure tested in place without leakage prior to backfilling.

(b) Sanitary piping passing over water lines shall, in addition, be protected by providing:

1. A vertical separation of at least 18 inches between the bottom of the sanitary piping and the top of the water line.

2. Adequate structural support for the sanitary piping to prevent excessive deflection of the joints and the settling on and breaking of the water line.

3. That the length, minimum 20 feet, of the sanitary piping be centered at the point of the crossing so that joints shall be equidistant and as far as possible from the water line.]

[c. Sanitary sewer manholes: No water piping shall pass through or come in contact with any part of a sanitary sewer manhole.]

3.1.1.2 Earthwork

Perform earthwork operations in accordance with Section [_____, "_____."]

3.1.1.3 Pipe Laying and Jointing

Inspect each pipe and fitting before and after installation; replace those found defective and remove from site. Provide proper facilities for lowering sections of pipe into trenches. Lay nonpressure pipe with the bell [or groove] ends in the upgrade direction. Adjust spigots in bells [and tongues in grooves] to give a uniform space all around. Blocking or wedging between bells and spigots [or tongues and grooves] will not be permitted. Replace by one of the proper dimensions, pipe or fittings that do not allow sufficient space for installation of joint material. At the

end of each work day, close open ends of pipe temporarily with wood blocks or bulkheads. Provide batterboards not more than 25 feet apart in trenches for checking and ensuring that pipe invert elevations are as indicated. Laser beam method may be used in lieu of batterboards for the same purpose.

Branch connections shall be made by use of regular fittings or solvent cemented saddles as approved. Saddles for ABS and PVC composite pipe shall conform to Figure 2 of ASTM D 2680; saddles for ABS pipe shall comply with Table 3 of ASTM D 2751; and saddles for PVC pipe shall conform to Table 4 of ASTM D 3034.

3.1.1.4 Connections to Existing Lines

Obtain approval from the Contracting Officer before making connection to existing line. Conduct work so that there is minimum interruption of service on existing line.

3.1.2 Special Requirements

3.1.2.1 Installation of Cast Iron Soil Piping

Unless otherwise specified, install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the recommendations of the pipe manufacturer. Make joints with the rubber gaskets specified for cast iron soil pipe joints and assemble in accordance with the recommendations of the pipe manufacturer.

3.1.2.2 Installation of Clay Piping

Install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the requirements of ASTM C 12 for pipe laying. Make joints with a compression joint material specified for clay pipe joints and assemble in accordance with the recommendations of the manufacturer of the pipe.

3.1.2.3 Installation of Concrete Gravity Sewer Piping

Install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the provisions for rubber gasket jointing and jointing procedures of ACPA 01-103 or of ACPA 01-102, Chapter 9, "Installation, Inspection and Construction Testing." Make joints with the gaskets specified for concrete gravity sewer pipe joints. Clean and dry surfaces receiving lubricants, cements, or adhesives. Affix gaskets to pipe not more than 24 hours prior to the installation of the pipe. Protect gaskets from sun, blowing dust, and other deleterious agents at all times. Before installation of the pipe, inspect gaskets and remove and replace loose or improperly affixed gaskets. Align each pipe section with the previously installed pipe section, and pull the joint together. If, while pulling the joint, the gasket becomes loose and can be seen through the exterior joint recess when the pipe is pulled up to within one inch of closure, remove the pipe and remake the joint.

3.1.2.4 Installation of Concrete Pressure Lines

Unless otherwise specified, install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the laying and joining requirements specified in the guide specifications for installation of pipe given in AWWA M9, Chapter 14,

"Guide Specifications for Installation of Pipe."

a. Joints: Make joints with the gaskets specified for concrete pressure pipe joints, using an approved lubricant recommended by the pipe manufacturer. Assemble these joints in accordance with the joining requirements specified in the guide specifications for installation of pipe given in AWWA M9, Chapter 14, "Guide Specifications for Installation of Pipe," and with the recommendations given for laying the pipe in AWWA M9, Chapter 6, "Installation by Trenching or Tunneling -- Methods and Equipment."

b. Pipe anchorage: Provide concrete thrust blocks (reaction backing) for pipe anchorage. Size and position thrust blocks as indicated. Use concrete conforming to ASTM C 94 having a minimum compressive strength of 2,000 psi at 28 days; or use concrete of a mix not leaner than one part cement 2 1/2 parts sand, and 5 parts gravel, having the same minimum compressive strength.

3.1.2.5 Installation of Ductile Iron Gravity Sewer Pipe

Unless otherwise specified, install pipe and associated fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the requirements of AWWA C600 for pipe installation and joint assembly.

a. [Make push-on joints with the gaskets and lubricant specified for this type joint and assemble in accordance with the applicable requirements of AWWA C600 for joint assembly.] Make mechanical-joints with the gaskets, glands, bolts, and nuts specified for this type joint and assemble in accordance with the applicable requirements of AWWA C600 for joint assembly and the recommendations of Appendix A to AWWA C111.

b. Exterior protection: Completely encase buried ductile iron pipelines with polyethylene tube or sheet in accordance with AWWA C105, using [Class A] [Class C] polyethylene film.

3.1.2.6 Installation of Ductile-Iron Pressure Lines

Unless otherwise specified, install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the requirements of AWWA C600 for pipe installation, joint assembly, and valve-and-fitting installation.

a. [Make push-on joints with the gaskets and lubricant specified for this type joint and assemble in accordance with the applicable requirements of AWWA C600 for joint assembly.] Make mechanical-joints with the gaskets, glands, bolts, and nuts specified for this type joint; assemble in accordance with the applicable requirements of AWWA C600 for joint assembly and the recommendations of Appendix A to AWWA C111. [Make flanged joints with gaskets, bolts, and nuts specified for this type joint. Make flanged joints up tight, taking care to avoid undue strain on flanges, fittings, and other accessories. Align bolt holes for each flanged joint. Use full size bolts for the bolt holes; use of undersized bolts to make up for misalignment of bolt holes or for any other purpose will not be permitted. Do not allow adjoining flange faces to be out of parallel to such degree that the flanged joint cannot be made watertight without overstraining

the flange. When flanged pipe or fittings have dimensions that do not allow the making of a proper flanged joint as specified, replace it by one of proper dimensions.] [Assemble joints made with sleeve-type mechanical couplings in accordance with the recommendations of the coupling manufacturer, as approved.] [Make [grooved] [and] [shouldered] type joints with the couplings previously specified for this type joint connecting pipe with the [grooved] [or] [shouldered] ends specified for this type joint and assemble in accordance with the recommendations of the coupling manufacturer, as approved. [Groove pipe in the field only with approved groove cutting equipment designed especially for the purpose and produced by a manufacturer of grooved joint couplings; secure approval for field-cut grooves before assembling the joint.]]

b. Exterior protection: Completely encase buried ductile iron pipelines with polyethylene tube or sheet in accordance with AWWA C105, using [Class A] [Class C] polyethylene film.

c. Pipe anchorage: Provide concrete thrust blocks (reaction backing) for pipe anchorage. Size and position thrust blocks as indicated. Use concrete conforming to ASTM C 94 having a minimum compressive strength of 2,000 psi at 28 days; or use concrete of a mix not leaner than one part cement, 2 1/2 parts sand, and 5 parts gravel, having the same minimum compressive strength.

3.1.2.7 Installation of ABS Composite Plastic Piping

Install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the recommendations of the plastic pipe manufacturer. Make joints with the primer and solvent cement specified for this joint and assemble in accordance with the recommendations of the pipe manufacturer. Handle solvent cement in accordance with ASTM F 402.

3.1.2.8 Installation of ABS Solid-Wall Plastic Piping

Install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the recommendations of the plastic pipe manufacturer. Make solvent cement joints with the solvent cement previously specified for this type joint. Make elastomeric joints with the gaskets specified for this type joint and assemble in accordance with the recommendations of the pipe manufacturer. Handle solvent cement in accordance with ASTM F 402.

3.1.2.9 Installation of PVC Plastic Piping

Install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of this section and with the requirements of ASTM D 2321 for laying and joining pipe and fittings. Make joints with the gaskets specified for joints with this piping and assemble in accordance with the requirements of ASTM D 2321 for assembly of joints. Make joints to other pipe materials in accordance with the recommendations of the plastic pipe manufacturer.

3.1.2.10 Installation of PVC Plastic Pressure Pipe and Fittings

Unless otherwise specified, install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of

this section; with the requirements of UBPPA UNI-B-3 for laying of pipe, joining PVC pipe to fittings and accessories, and setting of hydrants, valves, and fittings; and with the recommendations for pipe joint assembly and appurtenance installation in AWWA M23, Chapter 7, "Installation."

a. Pipe Less Than 4 Inch Diameter:

(1) Threaded joints shall be made by wrapping the male threads with joint tape or by applying an approved thread lubricant, then threading the joining members together. The joints shall be tightened with strap wrenches which will not damage the pipe and fittings. The joint shall be tightened no more than 2 threads past hand-tight.

(2) Push-On Joints: The ends of pipe for push-on joints shall be beveled to facilitate assembly. Pipe shall be marked to indicate when the pipe is fully seated. The gasket shall be lubricated to prevent displacement. Care shall be exercised to ensure that the gasket remains in proper position in the bell or coupling while making the joint.

(3) Solvent-weld joints shall comply with the manufacturer's instructions.

b. Pipe 4 Inch Diameter Joints: Make push-on joints with the elastomeric gaskets specified for this type joint, using either elastomeric-gasket bell-end pipe or elastomeric-gasket couplings. For pipe-to-pipe push-on joint connections, use only pipe with push-on joint ends having factory-made bevel; for push-on joint connections to fittings, cut spigot end of pipe off square and re-bevel pipe end to a bevel approximately the same as that on ductile-iron pipe used for the same type of joint. Use an approved lubricant recommended by the pipe manufacturer for push-on joints. Assemble push-on joints for pipe-to-pipe joint connections in accordance with the requirements of UBPPA UNI-B-3 for laying the pipe and the recommendations in AWWA M23, Chapter 7, "Installation," for pipe joint assembly. Assemble push-on joints for connection to fittings in accordance with the requirements of UBPPA UNI-B-3 for joining PVC pipe to fittings and accessories and with the applicable requirements of AWWA C600 for joint assembly. Make compression-type joints/mechanical-joints with the gaskets, glands, bolts, nuts, and internal stiffeners specified for this type joint and assemble in accordance with the requirements of UBPPA UNI-B-3 for joining PVC pipe to fittings and accessories, with the applicable requirements of AWWA C600 for joint assembly, and with the recommendations of Appendix A to AWWA C111. Cut off spigot end of pipe for compression-type joint/mechanical-joint connections and do not re-bevel.

c. Pipe anchorage: Provide concrete thrust blocks (reaction backing) for pipe anchorage. Size and position thrust blocks as indicated. Use concrete conforming to ASTM C 94 having a minimum compressive strength of 2,000 psi at 28 days; or use concrete of a mix not leaner than one part cement, 2 1/2 parts sand, and 5 parts gravel, having the same minimum compressive strength.

3.1.2.11 Pipeline Installation Beneath Railroad Right-of-Way

Where pipeline passes under the right-of-way of a commercial railroad,

install piping in accordance with the specifications for pipelines conveying nonflammable substances in AREMA 1-5.

3.1.3 Concrete Work

Cast-in-place concrete is included in Section 03300N, "Cast-In-Place Concrete."

The pipe shall be supported on a concrete cradle, or encased in concrete where indicated or directed.

3.1.4 Manhole Construction

Construct base slab of cast-in-place concrete or use precast concrete base sections. Make inverts in cast-in-place concrete and precast concrete bases with a smooth-surfaced semi-circular bottom conforming to the inside contour of the adjacent sewer sections. For changes in direction of the sewer and entering branches into the manhole, make a circular curve in the manhole invert of as large a radius as manhole size will permit. For cast-in-place concrete construction, either pour bottom slabs and walls integrally or key and bond walls to bottom slab. No parging will be permitted on interior manhole walls. For precast concrete construction, make joints between manhole sections with the gaskets specified for this purpose; install in the manner specified for installing joints in concrete piping. Parging will not be required for precast concrete manholes. Cast-in-place concrete work shall be in accordance with the requirements specified under paragraph entitled "Concrete Work" of this section. Make joints between concrete manholes and pipes entering manholes with the resilient connectors specified for this purpose; install in accordance with the recommendations of the connector manufacturer. Where a new manhole is constructed on an existing line, remove existing pipe as necessary to construct the manhole. Cut existing pipe so that pipe ends are approximately flush with the interior face of manhole wall, but not protruding into the manhole. Use resilient connectors as previously specified for pipe connectors to concrete manholes.

3.1.5 Miscellaneous Construction and Installation

3.1.5.1 Connecting to Existing Manholes

Pipe connections to existing manholes shall be made so that finish work will conform as nearly as practicable to the applicable requirements specified for new manholes, including all necessary concrete work, cutting, and shaping. The connection shall be centered on the manhole. Holes for the new pipe shall be of sufficient diameter to allow packing cement mortar around the entire periphery of the pipe but no larger than 1.5 times the diameter of the pipe. Cutting the manhole shall be done in a manner that will cause the least damage to the walls.

3.1.5.2 Metal Work

a. Workmanship and finish: Perform metal work so that workmanship and finish will be equal to the best practice in modern structural shops and foundries. Form iron to shape and size with sharp lines and angles. Do shearing and punching so that clean true lines and surfaces are produced. Make castings sound and free from warp, cold shuts, and blow holes that may impair their strength or

appearance. Give exposed surfaces a smooth finish with sharp well-defined lines and arises. Provide necessary rabbets, lugs, and brackets wherever necessary for fitting and support.

b. Field painting: After installation, clean cast-iron frames, covers, gratings, and steps not buried in concrete to bare metal of mortar, rust, grease, dirt, and other deleterious materials and apply a coat of bituminous paint. Do not paint surfaces subject to abrasion.

3.1.6 Sewage Absorption Trench Construction

Grade pipe lines uniformly downward to the outlet. Lay perforated pipe with the perforations downward. Lay drain tile with 1/4 inch open joints. Cover open joints of drain tile with the cover material specified so that it extends not less than 100 degrees on each side of the vertical center line of the tile. Wire covering in place.

3.1.7 Installations of Wye Branches

Cutting into piping for connections shall not be done except in special approved cases. When the connecting pipe cannot be adequately supported on undisturbed earth or tamped backfill, the pipe shall be encased in concrete backfill or supported on a concrete cradle as directed. Concrete required because of conditions resulting from faulty construction methods or negligence by the Contractor shall be installed at no additional cost to the Government. The installation of wye branches in an existing sewer shall be made by a method which does not damage the integrity of the existing sewer. One acceptable method consists of removing one pipe section, breaking off the upper half of the bell of the next lower section and half of the running bell of wye section. After placing the new section, it shall be rotated so that the broken half of the bell will be at the bottom. The two joints shall then be made with joint packing and cement mortar.

3.2 FIELD QUALITY CONTROL

3.2.1 Field Tests and Inspections

The Contracting Officer will conduct field inspections and witness field tests specified in this section. The Contractor shall perform field tests and provide labor, equipment, and incidentals required for testing[, except that water and electric power needed for field tests will be furnished as set forth in Section [_____, "_____"]]. Be able to produce evidence, when required, that each item of work has been constructed in accordance with the drawings and specifications.

3.2.2 Tests for Nonpressure Lines

Check each straight run of pipeline for gross deficiencies by holding a light in a manhole; it shall show a practically full circle of light through the pipeline when viewed from the adjoining end of line. When pressure piping is used in a nonpressure line for nonpressure use, test this piping as specified for nonpressure pipe.

3.2.2.1 Leakage Tests

Test lines for leakage by either infiltration tests or exfiltration tests,

or by low-pressure air tests. Prior to testing for leakage, backfill trench up to at least lower half of pipe. When necessary to prevent pipeline movement during testing, place additional backfill around pipe sufficient to prevent movement, but leaving joints uncovered to permit inspection. When leakage or pressure drop exceeds the allowable amount specified, make satisfactory correction and retest pipeline section in the same manner. Correct visible leaks regardless of leakage test results.

a. Infiltration tests and exfiltration tests: Perform these tests for sewer lines made of the specified materials, not only concrete, in accordance with ASTM C 969. Make calculations in accordance with the Appendix to ASTM C 969.

b. Low-pressure air tests: Perform tests as follows:

(1) Clay pipelines: Test in accordance with ASTM C 828. Allowable pressure drop shall be as given in ASTM C 828. Make calculations in accordance with the Appendix to ASTM C 828.

(2) Concrete pipelines: Test in accordance with ASTM C 924. Allowable pressure drop shall be as given in ASTM C 924. Make calculations in accordance with the Appendix to ASTM C 924.

(3) Ductile-iron pipelines: Test in accordance with the applicable requirements of ASTM C 924. Allowable pressure drop shall be as given in ASTM C 924. Make calculations in accordance with the Appendix to ASTM C 924.

(4) ABS composite plastic pipelines: Test in accordance with the applicable requirements of UBPPA UNI-B-6. Allowable pressure drop shall be as given in UBPPA UNI-B-6. Make calculations in accordance with the Appendix to UBPPA UNI-B-6.

(5) PVC plastic pipelines: Test in accordance with UBPPA UNI-B-6. Allowable pressure drop shall be as given in UBPPA UNI-B-6. Make calculations in accordance with the Appendix to UBPPA UNI-B-6.

3.2.2.2 Deflection Testing

Perform a deflection test on entire length of installed plastic pipeline on completion of work adjacent to and over the pipeline, including leakage tests, backfilling, placement of fill, grading, paving, concreting, and any other superimposed loads determined in accordance with ASTM D 2412. Deflection of pipe in the installed pipeline under external loads shall not exceed 4.5 percent of the average inside diameter of pipe. Determine whether the allowable deflection has been exceeded by use of a pull-through device or a deflection measuring device.

a. Pull-through device: This device shall be a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft. Circular sections shall be so spaced on the shaft that distance from external faces of front and back sections will equal or exceed diameter of the circular section. Pull-through device may also be of a design promulgated by the Uni-Bell Plastic Pipe Association, provided the device meets the applicable requirements specified in this paragraph, including those for diameter of the device, and that the mandrel has a minimum of 9 arms. Ball, cylinder, or circular sections shall conform to the following:

(1) A diameter, or minor diameter as applicable, of 95 percent of the average inside diameter of the pipe; tolerance of plus 0.5 percent will be permitted.

(2) Homogeneous material throughout, shall have a density greater than 1.0 as related to water at 39.2 degrees F, and shall have a surface Brinell hardness of not less than 150.

(3) Center bored and through-bolted with a 1/4 inch minimum diameter steel shaft having a yield strength of not less than 70,000 pounds per square inch, with eyes or loops at each end for attaching pulling cables.

(4) Each eye or loop shall be suitably backed with a flange or heavy washer such that a pull exerted on opposite end of shaft will produce compression throughout remote end.

b. Deflection measuring device: Sensitive to 1.0 percent of the diameter of the pipe being tested and shall be accurate to 1.0 percent of the indicated dimension. Deflection measuring device shall be approved prior to use.

c. Pull-through device procedure: Pass the pull-through device through each run of pipe, either by pulling it through or flushing it through with water. If the device fails to pass freely through a pipe run, replace pipe which has the excessive deflection and completely retest in same manner and under same conditions.

d. Deflection measuring device procedure: Measure deflections through each run of installed pipe. If deflection readings in excess of 4.5 percent of average inside diameter of pipe are obtained, retest pipe by a run from the opposite direction. If retest continues to show a deflection in excess of 4.5 percent of average inside diameter of pipe, replace pipe which has excessive deflection and completely retest in same manner and under same conditions.

3.2.3 Tests for Pressure Lines

Test pressure lines in accordance with the applicable standard specified in this paragraph, except for test pressures. For hydrostatic pressure test, use a hydrostatic pressure 50 psi in excess of the maximum working pressure of the system, but not less than 100 psi, holding the pressure for a period of not less than one hour. For leakage test, use a hydrostatic pressure not less than the maximum working pressure of the system. Leakage test may be performed at the same time and at the same test pressure as the pressure test. [Test ductile-iron pressure lines in accordance with the requirements of AWWA C600 for hydrostatic testing. Leakage on ductile-iron pipelines with mechanical-joints [or push-on joints] shall not exceed the amounts given in AWWA C600; allow no leakage at joints made by other methods.] [Test concrete pressure lines in accordance with the recommendations in AWWA M9, Chapter 10, "Hydrostatic Testing and Disinfection of Mains." Leakage on concrete pipelines shall not exceed 20 gallons per 24 hours per inch of pipe diameter per mile of pipeline.] [Test PVC plastic pressure lines in accordance with the requirements of UBPPA UNI-B-3 for pressure and leakage tests, using the allowable leakage given therein.]

3.2.4 Field Tests for Concrete

Field testing requirements are covered in Section [_____, "_____."]
-- End of Section --

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SECTION 02556A

GAS DISTRIBUTION SYSTEM
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN 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	(2000) Diaphragm Type Gas Displacement Meters (500 Cubic Feet per Hour Capacity and Over)

AMERICAN PETROLEUM INSTITUTE (API)

API Spec 5L	(2000) 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/A 53M	(1999b) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A 181/A 181M	(2000) Carbon Steel Forgings, for General-Purpose Piping
ASTM D 2513	(2000) Thermoplastic Gas Pressure Pipe, Tubing, and Fittings
ASTM D 2517	(2000) Reinforced Epoxy Resin Gas Pressure Pipe and Fittings
ASTM D 2683	(1998) Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing
ASTM D 3261	(1997) Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
ASTM D 3308	(1997) PTFE Resin-Skived Tape

ASTM D 3350	(1999) 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 BPVC SEC VIII D1	(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)
FS TT-E-2784	(Rev A) Enamel (Acrylic-Emulsion, Exterior Gloss and Semigloss) (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	(1994) Commercial Blast Cleaning
SSPC SP 7	(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; [_____], [_____]

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; [_____], [_____]

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 Waterways and Flange Kits.

b. Meters.

c. Pressure Reducing Valves.

d. Regulators.

e. [Earthquake Actuated Automatic Gas Shutoff System]

f. Emergency Gas Supply Connection.

Spare Parts Data; [_____], [_____]

Spare parts lists for each different item of material and equipment specified, after approval of the detail drawings and not later than [_____] 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; [_____], [_____]

Notification of the Contractor's schedule for making connections to existing gas lines, at least 10 days in advance.

Welding Steel Piping; [_____], [_____]

A copy of qualified welding procedures along with a list of names and identification symbols of performance qualified welders and welding operators.

Jointing Polyethylene and Fiberglass Piping; G, [_____]

A copy of qualified jointing procedures, training procedures, qualifications of trainer, and training test results for joiners and inspectors.

Connection and Abandonment Plan; G, [_____]

A copy of procedures for gas line tie in, hot taps, abandonment/removal or demolition, purging, and plugging as applicable in accordance with ASME B31.8.

SD-06 Test Reports

Pressure and Leak Tests; G, [_____]

Data from all pressure tests of the distribution system.

SD-07 Certificates

Utility Work; [_____], [_____]

Certification from the Operating Agency/Utility Company that work for which the Utility is responsible has been completed.

Training; [_____], [_____]

A copy of each inspector's and jointer's training certificate with respective test results.

SD-10 Operation and Maintenance Data

Gas Distribution System; [_____], [_____]

[Six] [_____] 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, and procedures for abandoning gas piping and system components.

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 and procedures for connecting emergency gas supply.

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 Welding Steel Piping

Welding and nondestructive testing procedures for pressure piping are specified in Section 05093 WELDING PRESSURE PIPING. Structural members shall be welded in accordance with Section 05090 WELDING, STRUCTURAL.

1.3.2 Jointing Polyethylene and Fiberglass 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/A 53M, 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 [_____]. 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 [_____] 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. Minimum wall thickness shall be [_____].

2.1.8 Fiberglass Pipe, Fittings and Adhesive

Fiberglass pipe, fittings and adhesive shall conform to ASTM D 2517. Pipe sections shall be marked as required by ASTM D 2517. Minimum wall thickness shall be [_____].

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 waterways 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.

2.1.11.3 Dielectric Waterways and Flanges

Dielectric waterways shall have temperature and pressure rating equal to or greater than that specified for the connecting piping. Waterways shall have metal connections on both ends suited to match connecting piping. Dielectric waterways shall be internally lined with an insulator specifically designed to prevent current flow between dissimilar metals. Dielectric flanges shall meet the performance requirements described herein for dielectric waterways.

2.1.12 Gas Transition Fittings

Gas transition fittings shall be manufactured steel fittings approved for jointing steel and polyethylene or fiberglass pipe. Approved transition fittings are those that conform to AGA 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 [_____] 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 [_____] 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 BPVC SEC VIII D1.

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 [pipe] [pedestal] mounted [and be provided with a strainer immediately upstream]. [Meters shall be provided with [over-pressure protection as specified in ASME B31.8] [tamper-proof protection] [frost protection] [fungus-proof protection].] Meters shall be suitable for accurately measuring and handling gas at pressures, temperatures, and flow rates indicated. Meters shall have a pulse switch initiator capable of operating up to speeds of 500 pulses per minute with no false pulses and shall require no field adjustments. Initiators shall provide the maximum number of pulses up to 500 per minute that is obtainable from the manufacturer. It shall provide not less than one pulse per 100 cubic feet of gas.

2.5 EARTHQUAKE ACTUATED AUTOMATIC GAS SHUTOFF SYSTEM

Earthquake Actuated Automatic Gas Shutoff devices shall conform to [_____] [and] [requirements furnished by the Contracting Officer], and 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.

2.6 EMERGENCY GAS SUPPLY CONNECTION

The emergency gas supply connection shall consist of piping (same size as service line) and accessories that will enable a portable, commercial-sized gas cylinder system to be connected to the gas piping system. This connection shall be capped to prevent gas leakage with a lockable manual valve located to be capable of shutting off flow. The entire assembly should be contained in a weatherproof, lockable box. The box shall contain permanently installed written instructions stating the type and pressure of the gas allowed to be connected to the line. The instructions shall also indicate and provide specific instruction for testing of the integrity of the building's gas system with an inert gas before the fuel gas connection is made. A subplate shall be provided in the box that is required to be unbolted to gain access to the connection. The subplate shall contain a warning regarding the potential consequences of using gas other than that specified or of failing to test system integrity before hooking up emergency fuel supply.

2.7 PROTECTIVE COVERING MATERIALS

Continuously extruded polyethylene and adhesive coating system materials shall conform to NACE RP0185, Type A.

2.8 TELEMETERING OR RECORDING GAUGES

Each distribution system supplied by more than one district pressure regulating station shall be equipped with telemetering or recording pressure gauges to indicate the gas pressure in the district line.

PART 3 EXECUTION

3.1 EXCAVATION AND BACKFILLING

Earthwork shall be as specified in Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

3.2 GAS MAINS

Pipe for gas mains shall be [steel] [polyethylene] [or] [fiberglass]. [Steel pipe and fittings shall be coated with protective covering as specified.] [Polyethylene or fiberglass mains shall not be installed aboveground.]

3.3 SERVICE LINES AND EMERGENCY GAS SUPPLY CONNECTION

Service lines shall be constructed of materials specified for gas mains and shall extend from a gas main to and including the point of delivery within 5 feet of the building. The point of delivery is the [meter set assembly] [service regulator] [shutoff valve]. The service lines shall be connected to the gas mains [as indicated] [through service tees, with end of run plugged]. 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 or fiberglass service lines shall not be installed aboveground except as permitted in ASME B31.8.

3.3.1 Emergency Gas Supply Connection

An aboveground locked, valved and capped emergency gas supply connection shall be provided [downstream] [upstream] of the pressure regulator. The connection shall be located outside of the building within 12 inches of the exterior wall and installed in a weatherproof box which is mounted on the exterior wall and clearly marked with an appropriate metal sign mounted on wall above.

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. 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 09900 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 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] [B], Grade B.

3.5.2.2 Nonferrous Surfaces

[Nonferrous surfaces shall not be painted.] [Nonferrous surfaces shall be painted due to corrosive conditions. The surfaces shall be solvent-cleaned in accordance with SSPC SP 1. A first coat of FS TT-E-2784, Type III, Flat, and 2 coats of FS TT-E-2784, Enamel [Type I, Gloss] [or] [Type II, Semigloss] shall be applied.]

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. Abandoning existing gas piping shall be done in accordance with ASME B31.8. Pipe shall be cut without damaging the pipe. Unless otherwise authorized, cutting shall be done by an approved type of mechanical cutter. Wheel cutters shall be used where practicable. 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 or fiberglass piping is installed underground, foil backed magnetic tape shall be placed above the pipe to permit locating with a magnetic detector. After laying of pipe and testing, trench shall be backfilled in accordance with Section 02316 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 and Fiberglass 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 DRIPS

Drips shall be installed at locations where indicated. Drips shall conform to the details shown or may be commercial units of approved type and capacity. A blow off pipe 1-1/4 inches or larger shall be connected to each drip at its lowest point and shall extend to or near the ground surface at a convenient location away from traffic. Discharge for each drip terminal (outlet) shall be provided with a reducing fitting, a plug valve, and a 1/2 inch nipple turned down. The discharge terminal (outlet) shall be inside a length of 12 inches or larger vitrified clay pipe, concrete sewer pipe or concrete terminal box [set vertically on a bed of coarse gravel 1 foot thick and 3 feet square,] [with concrete bottom to contain liquids and a connection to remove liquids for disposal,] and closed at the ground surface with a suitable replacement cover.

3.10 PRESSURE REGULATOR INSTALLATION

3.10.1 Main Distribution Line Regulators

Pressure regulators shall be installed where shown. A valve shall be installed on each side of the regulator for isolating the regulator for maintenance. A bypass line with bypass valves or 3 way valves and an overpressurization pressure regulating device shall be provided. Regulators and valves shall be installed in rectangular reinforced concrete boxes. Boxes shall be large enough so that all required equipment can be properly installed, operated, and maintained. Sidewalls shall extend above ground line. The boxes shall be provided with [steel door] [cast iron manhole] covers with locking provisions and 4 inch diameter vents. One key or other unlocking device shall be furnished with each cover. Discharge stacks, vents, or outlet ports of all pressure relief devices shall be located where gas can be discharged into the atmosphere without undue hazard. Stacks and vents shall be provided with fittings to preclude entry of water.

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 Connections to Publicly or Privately Operated Gas Utility Lines

Contractor shall provide materials for the connections to the existing gas lines. Final connections and the turning on of gas shall be made by the utility. Existing lines that are to be a abandoned or taken out of service shall be disconnected, purged and capped, plugged or otherwise effectively sealed by the Utility. The Contractor shall notify the Contracting Officer, in writing, 10 days before final connections and turning on of gas lines. The Contractor shall make necessary arrangements with the Utility for tie in and activation of new gas lines. Only the Operating Agency/Utility Company may reactivate the system after tie in. The Contractor shall furnish a certification by the Operating Agency/Utility Company that all Utility work has been satisfactorily completed.

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 and Abandonment 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 Contractor shall notify the Contracting Officer, in writing, 10 days before connections to existing lines are to be made.

a. If facilities are abandoned in place, they shall be physically disconnected from the piping system. The open ends of all abandoned facilities shall be purged, capped, plugged or otherwise effectively sealed. Abandonment shall not be completed until it has been determined that the volume of gas or liquid hydrocarbons contained within the abandoned section poses no potential hazard. Air or inert gas may be used for purging, or the facility may be filled with water or other inert material. If air is used for purging, the Contractor shall ensure that a combustible mixture is not present after purging.

b. When a main is abandoned, together with the service lines connected to it, only the customer's end of such service lines is required to be sealed as stipulated above.

c. Service lines abandoned from the active mains shall be disconnected as close to the main as practicable.

d. All valves left in the abandoned segment shall be closed.

e. All abovegrade valves, risers, and vault and valve box covers shall be removed. Vault and valve box voids shall be filled with suitable compacted backfill material.

3.13 CATHODIC PROTECTION

Cathodic protection shall be provided for all metallic gas piping installed underground and shall be installed as specified in [Section 13110CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE)] [Section 13112 CATHODIC PROTECTION SYSTEM (IMPRESSED CURRENT)].

3.14 TESTS

3.14.1 Destructive Tests of Plastic Pipe Joints

Each day, prior to making polyethylene heat fusion joints or fiberglass adhesive joints, a joint of each size and type to be installed that day shall be made by each person performing joining of plastic pipe that day and destructively tested. At least 3 longitudinal straps shall be cut from each joint. Each strap shall be visually examined, shall not contain voids or discontinuities on the cut surfaces of the joint area, and shall be deformed by bending, torque, or impact, and if failure occurs, it must not initiate in the joint area. If a joint fails the visual or deformation test, the qualified joiner who made that joint shall not make further field joints in plastic pipe on this job until that person has been retrained and requalified. The results of the destructive tests shall be recorded to include the date and time of the tests, size and type of the joints, ambient conditions, fusion iron temperature and names of inspectors and joiners.

3.14.2 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 [_____]. The test pressure is [_____]. Prior to testing the system, the interior shall be blown out, cleaned and cleared of all foreign materials. All meters, regulators, and controls shall be removed before blowing out and cleaning and reinstalled after clearing of all foreign materials. Testing of gas mains and service lines shall be done with due regard for the safety of employees and the public during the test. Persons not working on the test operations shall be kept out of the testing area while testing is proceeding. The test shall be made on the system as a whole or on sections that can be isolated. Joints in sections shall be tested prior to backfilling when trenches must be backfilled before the completion of other pipeline sections. The test shall continue for at least 24 hours from the time of the initial readings to the final readings of pressure and temperature. The initial test readings of the instrument shall not be made for at least 1 hour after the pipe has been subjected to the full test pressure, and neither the initial nor final readings shall be made at times of rapid changes in atmospheric conditions. The temperatures shall be representative of the actual trench conditions. There shall be no indication of reduction of pressure during the test after corrections have

been made for changes in atmospheric conditions in conformity with the relationship T(1)P(2)=T(2)P(1), in which T and P denote absolute temperature and pressure, respectively, and the numbers denote initial and final readings. During the test, the entire system shall be completely isolated from all compressors and other sources of air pressure. Each joint shall be tested by means of soap and water or an equivalent nonflammable solution prior to backfilling or concealing any work. The testing instruments shall be approved by the Contracting Officer. All labor, materials and equipment for conducting the tests shall be furnished by the Contractor and shall be subject to inspection at all times during the tests. The Contractor shall maintain safety precautions for air pressure testing at all times during the tests.

-- End of Section --

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SECTION 02561

(SOUTH DAKOTA) PAVEMENTS FOR SMALL PROJECTS
08/99

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO T 193	(1993) Standard Method of Test for the California Bearing Ratio
AASHTO T 180	(1993) Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and an 457 mm (18-in) Drop

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)\

ASTM C 127	(1988) Specific Gravity and Absorption of Coarse Aggregate
ASTM C 128	(1997) Specific Gravity and Absorption of Fine Aggregate
ASTM C 150	(1998) Portland Cement
ASTM C 881	(1990) Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C 1116	(2000) Fiber-Reinforced Concrete and Shotcrete
ASTM D 1075	(1996) Effect of Water on Compressive Strength of Compacted Bituminous Mixtures
ASTM D 1556	(1990; R 1996) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1991) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))
ASTM D 2041	(1995) Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D 2726	(1996a) Bulk Specific Gravity and Density of Non-Absorptive Compacted bituminous

	Mixtures
ASTM D 2950	(1991; R 1997) Density of Bituminous Concrete In Place by Nuclear Method
ASTM D 3381	(1992) Viscosity-Graded Asphalt Cement for use in Pavement Construction
ASTM D 3569	(1995) Specification for Joint Sealant, Hot Applied, Elastomeric Jet Fuel Resistant-Type for Portland Cement Concrete Pavements

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION (SDDOT)

	Standard Specifications for Road and Bridge Construction, and Supplemental Specifications, 1998 Edition

CORPS OF ENGINEERS (COE) HAND BOOK FOR CONCRETE AND CEMENT

CRD-C 171	(1995) Standard Test Method For Determining Percentage of Crushed Particles in Aggregate
CRD-C 526	(1992) Sealants, Joints, Two Component, Jet Blast-Resistant, Cold Applied, For Portland Cement Concrete Pavement
CRD-C 649	(1995) Standard Test Method For Determining Unit Weight, Marshall Stability, and Flow of Bituminous Mixtures
CRD-C 650	(1995) Standard Test Method For Density and Percent Voids in Compacted Bituminous Paving Mixtures
CRD-C 652	(1995) Standard Test Method For Measurement of Reduction in Marshall Stability of Bituminous Mixtures Caused by Immersion in Water

1.2 MEASUREMENT AND PAYMENT

Section "MEASUREMENTS AND PAYMENT" of the SDDOT shall not apply.

1.3 MODIFICATION TO THE SDDOT

Reference to "Engineer" and "Department" in the SDDOT 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,] [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

SD-06 Test Reports

Initial Tests; G_

Certified copies of test results for approval not less than 20 days before material is required for the work.

Certified Refinery Analysis; G_

Asphalt Cement, Prime and Tack Coat

Bituminous Surface Course; G_

Include [Hveem][Marshall] Property Results

Aggregate; G_

Bituminous Surface Course and and Portland Cement Concrete.

Portland Cement Concrete; G_

Pavement Mix Design, Parking Area, Sidewalk, and Curb and Gutter.

Joint Sealant; G_

Certified Test Results for Pavement, Sidewalk, and Curb and Gutter.

Joint Fillers; G_

Certified Test Results for Airfield Pavement, Sidewalk, and Curb and Gutter

temperature-viscosity; G_

Certified test results showing the relationship between temperature and viscosity of 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, 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 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 380, "Portland Cement Comncrete Pavement" of the SDDOT.

1.8.4 Base Course, Subbase Course, Aggregate Surface Course

Construction of aggregate base course, subbase 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 BITUMINOUS SURFACE COURSE.

Bituminous surface course shall conform to the requirements specified in the SDDOT Section 320, "ASPHALT CONCRETE, GENERAL" for materials except as modified herein. Asphalt concrete shall conform to section 322, "ASPHALT CONCRETE - CLASS G". Aggregate shall meet the requirements as described in section 880, "AGGREGATE FOR ASPHALT CONCRETE". A recycled mixture shall not be used. The quantity of natural sand (fine aggregate) for the surface course mixture shall not exceed 20 percent by weight of coarse and fine aggregate and material passing the No. 200. [Bituminous surface course mixture shall be designed in accordance with CRD-C 649, CRD-C 650, and CRD-C 652. The finished mixture shall meet the requirements hereinafter described when tested in accordance with the above mentioned CRD-C's. The absorption value of the entire blend of aggregate shall be determined in accordance with ASTM C 127 and ASTM C 128. Aggregate with an absorption value which does not exceed 2.5 percent will be designated as nonabsorptive, and the apparent specific gravity or ASTM D 2041, shall be used in computing the voids total mix and voids filled with bitumen. Aggregate with an absorption value which exceeds 2.5 percent will be designated as absorptive, and ASTM D 2041, shall be used in computing voids total mix and voids filled with bitumen.] The bituminous surface course mixture shall meet the following physical requirements:

Test Property	[CRD-C] [Method]	[Nonabsorptive [Aggregate	Absorptive] Aggregate]
Stability, minimum, pounds	[649]	1000	1000
Flow, maximum, 1/100-inch units	[649]	20	20
Voids, total mix, percent	[650]	3-5	2-4
Voids, filled with bitumen, percent	[650]	70-80	80-90

2.1.1 Reduction in Stability by Immersion

If the index of retained stability of the specimens is less than 75, when tested in accordance with [CRD-C 652] [ASTM D 1075], the aggregates shall be rejected or the bitumen shall be treated with an approved antistripping agent. The amount of antistripping agent added to the bitumen shall be sufficient, as approved by the Contracting Officer, to produce an index of retained stability of 75 or greater when tested in accordance with [CRD-C 652] [ASTM D 1075]. No additional payment will be made for any addition of antistripping agent that may be required.

2.1.2 Contractor's Option

At the option of the Contractor, in lieu of developing a new job-mix

formula for surface course construction, the Contractor may use a job-mix formula for surface course construction which has been used within the last 12 months on another nearby Corps of Engineers project, provided in each instance that the same materials proposed for use on this project are being used, the JMF meets the previously specified criteria, and the JMF and test results are less than 12 months old. Use of this option will permit no changes o aggregate requirements or to other requirements specified in this section and shall not be the basis for additional cost to the Government or extension of time.

2.2 BITUMINOUS MATERIAL

Approval of bituminous materials shall be based on a certified refinery analysis submitted by the Contractor, showing that the material conforms to the requirements of the SDDOT or as specified herein.

2.2.1 ASPHALT CEMENT

Asphalt cement shall conform to the requirements specified in Section 890, "ASPHALT MATERIAL," of the SDDOT [and ASTM D 3381]. Asphalt cement shall be viscosity grade AC-10, penetration grade 85-100 or an approved performance graded (PG) cement.

2.2.2 BITUMINOUS PRIME COAT

Bituminous prime coat shall conform to and be placed to the requirements specified in Section 330, "PRIME, TACK AND FLUSH SEAL COATS," and Section 890, "ASPHALT MATERIAL" of the SDDOT. 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.

2.2.3 BITUMINOUS TACK COAT

Bituminous tack coat shall conform to the requirements specified in Section 330, "PRIME, TACK AND FLUSH SEAL COATS," and Section 890, "ASPHALT MATERIAL" of the SDDOT. Bituminous materials shall be approved by the contracting officer and shall be a liquid emulsion or cutback material.

2.3 PORTLAND CEMENT CONCRETE PAVEMENT

Portland cement concrete pavement shall conform to section 380, "PORTLAND CEMENT CONCRETE PAVEMENT" of the SDDOT, except as modified herein. Concrete for pavements shall have a minimum compressive strength of 4000 psi at 28 days. Coarse aggregate shall conform to section 820, "COARSE AGGREGATE FOR USE IN PORTLAND CEMENT CONCRETE" and shall be coarse aggregate for concrete pavement, size No. 1. Fine aggregate shall meet section 800, "FINE AGGREGATE FOR USE IN PORTLAND CEMENT CONCRETE". [Fly ash may be used in the mix proportioning.] [The use of fly ash shall not be substituted as a partial replacement of portland cement. The minimum portland cement content, regardless if fly ash is used or not shall be 564 pounds per cubic yard.] Portland cement shall be Type I or II of ASTM C 150 and shall meet the optional requirement for low alkali.

2.3.1 Contractor's Option

At the option of the Contractor, in lieu of developing a new portland cement concrete mix design, the Contractor may use a portland cement concrete mix design which has been used within the last 12 months provided

in each instance that the same materials proposed for use on this project are being used, the mix design meets the previously specified criteria, and the mix design and test results are less than 12 months old. Use of this option will permit no changes to aggregate requirements or to other requirements specified in this section and shall not be the basis for additional cost to the Government or extension of time. Data to submit for approval shall be the project name and location, date concrete was placed, type of materials and source location, and actual strength production data from plant produce concrete.

2.3.2 Curing Compound

Curing compound shall meet the requirements in section 821, "CONCRETE CURING MATERIALS". Material shall be a liquid membrane-forming compound.

2.3.3 Joint Sealing

Joint sealant shall conform to, and be placed in accordance with section 870, "CONCRETE JOINT SEALER"[, except that the sealant shall be jet fuel resistant and meet the requirements as specified ASTM D 3569 or CRD-C 526].

2.3.4 Welded Steel Wire Fabric

Welded steel wire fabric shall conform to Section 1010 of the SDDOT.

2.3.5 Dowels Bars and Tie Bars

Dowel bars and tie bars shall conform to Section 1010 of the SDDOT.

2.3.6 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.

2.3.7 Synthetic Fiber Reinforcement

Synthetic fibers shall be polypropylene with a denier not less than 100, multi-graded and have a maximum nominal fiber length of 2 inches. Fiber reinforcement shall be added to the concrete mix in accordance with the applicable sections of ASTM C 1116 and the recommendations of the manufacturer. The amount of fibers to be added to the concrete mix shall be in accordance with the manufacturer, but in no case shall the amount of fibers exceed 1.5 to 3.0 pounds per cubic yard.

2.4 BASE COURSES AND AGGREGATE SURFACE COURSE

The base course(s) and aggregate surfacing shall conform to and be placed in accordance with the requirements specified in Section 260, "GRANULAR BASES AND SURFACING". [Reclaimed asphalt pavement (RAP) from areas to be removed within the project site or commercially available recycled portland cement concrete (pcc) may also be used for new subbase construction provided [the RAP material or] the recycled pcc conforms to the physical requirements as stated below in paragraph[s]: ["Aggregate Base Course"] ["Subbase Course"] ["Aggregate Surface Course"].] At least one complete series of aggregate [base] [subbase][surface] course tests shall be performed in conformance to the SDDOT prior to the start of construction.

2.4.1 Initial Tests

One of each of the following tests shall be performed on the proposed aggregate 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.

2.4.2 Aggregate Base Course

Base course material shall be "AGGREGRATE BASE COURSE", in Section 882, "AGGREGRATES FOR GRANULAR BASES AND SURFACING" of the SDDOT except the range for the No. 200 sieve shall be 0-10% and the aggregate base course shall have a minimum California Bearing Ratio (CBR) of 80. The CBR shall be determined in accordance with AASHTO T l93.

2.4.3 Subbase Course

Subbase course shall conform to Section 882, "AGGREGATES FOR GRANULAR BASES AND SURFACING", Type "SUBBASE". [If gravel is used it shall contain a minimum of 75% crushed particles when tested in accordance to CRD-C 171.][The percentage passing the No. 200 sieve shall be within the range of 8% to 15%.] Testing shall be as necessary to demonstrate complete compliance with the requirements of the SDDOT specifications and as specified herein. The subbase course shall have a minimum California Bearing Ratio (CBR) of 50. The CBR shall be determined in accordance with AASHTO T l93.

2.4.4 Aggregate Surface Course

Aggregate surface course shall conform to Section 882, "AGGREGATES FOR GRANULAR BASES AND SURFACING," Type "Gravel Surfacing," except that when clay binder is required it shall conform to Section 883, "CLAY."

2.5 PORTLAND CEMENT CONCRETE [[STRUCTURAL,] SIDEWALKS, AND] CURB AND GUTTER

2.5.1 Structural Concrete

Portland cement concrete shall conform to the requirements specified in Section 460, "STRUCTURAL CONCRETE of the SDDOT. The aggregate shall conform to section 820, "COARSE AGGREGATE FOR USE IN PORTLAND CEMENT CONCRETE" and shall be coarse aggregate for Class M, Size No. 1 or 3. Fine aggregate shall meet section 800, "FINE AGGREGATE FOR USE IN PORTLAND CEMENT CONCRETE" of the SDDOT. Portland cement shall be approved based on certified mill certificate conforming to the requirements as specified in the SDDOT. All other materials shall conform to section 460.

2.5.2 Sidewalks

Portland cement concrete sidewalk shall conform to the requirements

specified in Section 651, "CONCRETE SIDEWALKS", except as modified herein. The portland cement concrete shall be Class M5. At the option of the contractor, the portland cement concrete as required herein above may be used. The aggregate shall conform to section 820, "COARSE AGGREGATE FOR USE IN PORTLAND CEMENT CONCRETE" and shall be coarse aggregate for Class M, size No. 1. Fine aggregate shall meet section 800, "FINE AGGREGATE FOR USE IN PORTLAND CEMENT CONCRETE" of the SDDOT. Joint Fillers and Joint Sealant shall be approved based on certified test results. The joint sealant shall be either a hot pour or a silicone and placed in accordance to Section 870 in the SDDOT.

2.5.2.1 Curing Compound

Curing compound shall meet the requirements in section 821, "CONCRETE CURING MATERIALS". Material shall be a liquid membrane-forming compound.

2.5.2.2 Synthetic Fiber Reinforcement

Synthetic fibers shall be polypropylene with a denier not less than 100, multi-graded and have a maximum nominal fiber length of 2 inches. Fiber reinforcement shall be added to the concrete mix in accordance with the applicable sections of ASTM C 1116 and the recommendations of the manufacturer. The amount of fibers to be added to the concrete mix shall be in accordance with the manufacturer, but in no case shall the amount of fibers exceed 1.5 to 3.0 pounds per cubic yard.

2.5.3 Curb and Gutter

Portland cement concrete curb and gutter shall conform to the requirements specified in Section 650, "CONCRETE CURB AND GUTTER" of the SDDOT, except as modified herein. The portland cement concrete shall be Class M5 and meet section 462, "CONCRETE FOR INCIDENTAL CONSTRUCTION - CLASS M". At the option of the contractor, portland cement concrete pavement as required herein above may be used. The aggregate shall conform to section 820, "COARSE AGGREGATE FOR USE IN PORTLAND CEMENT CONCRETE" and shall be coarse aggregate for Class M, size No. 1. Fine aggregate shall meet section 800, "FINE AGGREGATE FOR USE IN PORTLAND CEMENT CONCRETE" of the SDDOT. Joint Fillers and Joint Sealant shall be approved based on certified test results conforming to Section 650.

2.5.3.1 Curing Compound

Curing compound shall meet the requirements in section 821, "CONCRETE CURING MATERIALS". Material shall be a liquid membrane-forming compound.

2.5.3.2 Synthetic Fiber Reinforcement

Synthetic fibers shall be polypropylene with a denier not less than 100, multi-graded and have a maximum nominal fiber length of 2 inches. Fiber reinforcement shall be added to the concrete mix in accordance with the applicable sections of ASTM C 1116 and the recommendations of the manufacturer. The amount of fibers to be added to the concrete mix shall be in accordance with the manufacturer, but in no case shall the amount of fibers exceed 1.5 to 3.0 pounds per cubic yard.

PART 3 EXECUTION

3.1 PAVEMENT REMOVAL

Where pavement is to be removed at the locations shown on the drawings, the pavement shall be sawed using the double saw-cut method as shown on the drawings, full depth, and with an approved concrete saw prior to removal so as to leave a straight, true and vertical edge. The pavement material and underlying courses shall be removed in a manner that will not disturb the adjacent in-place material to remain. Material that is to remain but damaged by the Contractor's removal operations, shall be replaced at no additional cost to the Government as described herein. Base course material removed from the designated removal area as shown on the drawings shall be [wasted.][salvaged, stockpiled and reused except for the top 6 inches.] The top 6 inches shall be new aggregate base course material meeting the requirements as specified below.The top 6 inchesof base course material shall be scarified and recompacted to 100% of the maximum laboratory density. Pavement material from the removal area shall be stockpiled [as show on the drawings][in the location as determined by the contracting officer]. Any unused material shall be disposed of [off Government controlled land at the Contractor's expense].

3.2 COLD MILLING ASPHALT

Cold milling of bituminous surface course shall conform to the requirements specified in the SDDOT Section 332, "COLD MILLING ASPHALT" for construction procedures.

3.3 BITUMINOUS SURFACE COURSE.

Bituminous surface course shall conform to the requirements specified in the SDDOT Section 320, "ASPHALT CONCRETE, GENERAL" for construction procedures.

3.4 BITUMINOUS PRIME COAT

Bituminous prime coat shall be placed to the requirements specified in Section 330, "PRIME, TACK AND FLUSH SEAL COATS," and Section 890, "ASPHALT MATERIAL" of the SDDOT. Rate of application shall be not less than 0.15 gallon per square yard nor more than 0.40 gallon per square yard. The prime coat shall be applied only when the ambient temperature is 50^{o} F or above, and when the temperature has not been below 35^{o} F for 12 hours immediately prior to application, unless otherwise directed. The exact quantities, within the range specified, which may be varied to suit field conditions, will be determined by the Contracting Officer. The application temperature for liquid asphalt shall be as directed and shall provide an application viscosity between 20 and 120 centistokes, kinematic, or 10 and 60 seconds, Saybolt-Furol. Application temperatures shall be within the following ranges, except that the appropriate changes should be made when the range of viscosity is raised or lowered:

MC-30.....85-155 degrees F
MC-70.....120-190 degrees F

The temperature-viscosity relationship shall be furnished to the Contracting Officer.

3.5 BITUMINOUS TACK COAT

Bituminous tack coat shall be placed to the requirements specified in Section 330, "PRIME, TACK AND FLUSH SEAL COATS," and Section 890, "ASPHALT MATERIAL" of the SDDOT.

3.6 PORTLAND CEMENT CONCRETE PAVEMENT

Portland cement concrete pavement shall conform to, and be placed in accordance with, section 380, "PORTLAND CEMENT CONCRETE PAVEMENT" of the SDDOT, except as modified herein. The final surface texture shall be a burlap drag finish.

3.7 BASE COURSES AND AGGREGATE SURFACE COURSE

The base course(s) and aggregate surfacing shall be placed in accordance with the requirements specified in Section 260, "GRANULAR BASES AND SURFACING". All aggregate [base] [surface] course materials shall be approved prior to the start of construction. The base [and subbase] course[s] shall be compacted to a minimum 100% maximum laboratory density. Prior to placement of the subbase material the subgrade shall be scarified 6" and recompacted to a minimum 95% maximum laboratory density. The subgrade shall be approved by the contracting officer prior to the placement of subbase course material.

3.8 PORTLAND CEMENT CONCRETE [[STRUCTURAL,] SIDEWALKS, AND] CURB AND GUTTER

3.8.1 STRUCTURAL CONCRETE

Portland cement concrete for structures shall be placed in accordance with the requirements specified in Section 460, "STRUCTURAL CONCRETE of the SDDOT.

3.8.2 Sidewalks

Portland cement concrete sidewalk shall be placed in accordance with the requirements specified in Section 651, "CONCRETE SIDEWALKS", except as modified herein. [The sidewalk shall be constructed to the dimensions as shown in the attached Standard Drawing No. 40-17-01, Sheet 6 for new construction.] Replacement sidewalk shall match existing sidewalk or as directed by the Contracting Officer. At the end of the curing period, expansion [and contraction] joints shall be carefully cleaned and filled with joint sealer. Joints shall be filled with sealer and recessed from the concrete surface 1/8-inch and in such manner as to minimize spilling on the adjacent surface. Spilled sealing material shall be removed immediately and the surface of the sidewalk cleaned.

3.8.3 Curb and Gutter

Portland cement concrete curb and gutter shall placed in accordance with the requirements specified in Section 650, "CONCRETE CURB AND GUTTER" of the SDDOT, except as modified herein. [The Portland cement concrete curb and gutter shall be constructed to the dimensions as shown in the attached Standard Drawing No. 40-17-01, Sheet 1 for new construction.][Replacement of curb and gutter shall match the existing curb and gutter or as directed by the Contracting Officer.] At the end of the curing period, expansion [and contraction] joints shall be carefully cleaned and filled with joint sealer. Joints shall be filled with sealer and recessed from the concrete surface 1/8-inch and in such manner as to minimize spilling on the adjacent surface. Spilled sealing material shall be removed immediately and the surface of the cub and gutter.

3.9 SAMPLING AND TESTING

All quality control sampling and testing shall be the responsibility of the

Contractor and shall be performed at no additional cost to the Government in accordance with PARAGRAPH: CONTRACTOR QUALITY CONTROL in SECTION: SPECIAL CLAUSES and as specified herein. Sampling and testing shall be performed by an approved testing laboratory at the expense of the Contractor and shall be in accordance as defined herein and/or in the DOT. At least 15 working days prior to commencing construction, the Contractor shall submit for approval the aggregate base course tests results, and [the job mix formula plus aggregate tests results, the portland cement concrete mix design for airfield pavement , sidewalk, and curb and gutter] showing that all requirements specified herein and in the SDDOT are met. Any portion of the work not in conformance as described herein or on the drawings shall be removed and replaced at no additional cost to the .

3.9.1 In-Place Tests

3.9.1.1 Base Courses, Surface Courses, and Underlying Course

One of each of the following tests shall be performed on samples taken from the placed and compacted base and aggregate surface courses. Samples shall be taken for each 1000 square yards or less of each layer placed.

Sieve Analysis (Subbase, Base, and Surface Course)

Field Density and Moisture

Liquid-Limit and Plasticity-Index

3.9.2 Compaction

3.9.2.1 Base Courses, Surface Courses, and Underlying Course

Laboratory maximum density of new aggregate base and surface courses [and salvaged base] [and underlying course] shall be determined in accordance with ASTM D 1557, Procedure C. Density shall be measured in the field in accordance with ASTM D 1556. All base and aggregate surface courses shall be compacted to at least 100 percent of laboratory maximum density and underlying course to 95 percent of laboratory maximum density.

3.9.2.2 Bituminous Surface Course

Density of the compacted mixture of the surface course shall be a minimum of 97% and a maximum of 100% (95%-100% along joints) of the maximum field laboratory compacted density. At the option of the Contractor densities of the 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 as stated below.

3.9.3 Portland Cement Concrete

One of each of the following tests shall be performed on samples taken at the location of placement. Samples shall be taken every two hours during the actual placement of concrete [half day] or as directed by the Contracting Officer.

PCC (Portland Cement Concrete) air content and slump
PCC cylinders (Cast three specimens for testing at 28 days)
PCC Thickness - Two cores (Min. 4" Diameter) at two randomly selected

areas within the paving limits and as determined by the Contracting Officer.

3.9.4 Bituminous Mixtures

Samples of plant mixtures shall be taken at the start-up of the laydown operations each day and before the material is placed in the pavement. The sample shall be tested to determine conformance with the specified [Hveem][Marshall]l test properties for bituminous mixtures and to determine bitumen content and aggregate gradation.

3.9.4.1 Testing Frequency

a. [Hveem][Marshall] Tests

One set (three specimens) of tests shall be made for each 300 tons or less of bituminous mixture placed each day.

b. Extraction Tests.

Extraction tests shall be made to determine bitumen content and aggregate gradation at the same frequency specified above for Marshall tests.

c. Immersion Compression Tests.

One set of tests shall be made for the first day's construction and thereafter whenever there is any change in materials or job-mix formula.

3.9.4.2 Sampling Bituminous Pavements

Testing and sampling of the finished pavement, shall be performed by the Contractor. The location of the core samples shall be near the plant samples taken for [Hveem][Marshall] property determination, extraction and gradation and as directed by the Contracting Officer. The cores shall be at least 4 inches in diameter. The samples shall be tested by the Contractor to determine conformance to density, voids and thickness. Specimens shall be tested in accordance with the requirements of [CRD-C 650][ASTM D 2726]. Three samples shall be taken and tested for each 300 tons or less of bituminous mixture placed each day. At least one sample shall be taken from the longitudinal joint. The grade of the completed surface shall not deviate more than 0.05 foot from the plan grade. The finished surface when tested with a 12 foot straight edge shall not deviate from the surface by more then 1/4 inch. The straight edge shall be laid every 25 feet parallel and perpendicular to the paving lane centerline.

-- End of Section --

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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 190M	(1995) Bituminous Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M 252M	(1996) Corrugated Polyethylene Drainage Tubing
AASHTO M 294	(1998) Corrugated Polyethylene Pipe, 300- to 1200-mm Diameter

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 27/A 27M	(1996) Steel Castings, Carbon, for General Application
ASTM A 47/A 47M	(1999) Ferritic Malleable Iron Castings
ASTM A 48	(1994ael) Gray Iron Castings
ASTM A 48M	(1994ael) Gray Iron Castings (Metric)
ASTM A 123/A 123M	(2000) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 227/A 227M	(1999) Steel Wire, Cold-Drawn for Mechanical Springs
ASTM A 229/A 229M	(1999) Steel Wire, Oil-Tempered for Mechanical Springs
ASTM A 760/A 760M	(2000) Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains
ASTM A 762/A 762M	(2000) Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains
ASTM B 745/B 745M	(1997) Corrugated Aluminum Pipe for Sewers and Drains
ASTM C 4	(2000) Clay Drain Tile

ASTM C 14	(1999) Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C 14M	(1999) Concrete Sewer, Storm Drain, and Culvert Pipe (Metric)
ASTM C 55	(1999) Concrete Brick
ASTM C 62	(2000) Building Brick (Solid Masonry Units Made from Clay or Shale)
ASTM C 139	(1999) Concrete Masonry Units for Construction of Catch Basins and Manholes
ASTM C 150	(1999a) Portland Cement
ASTM C 231	(1997el) Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 412	(1999) Concrete Drain Tile
ASTM C 412M	(1999) Concrete Drain Tile (Metric)
ASTM C 425	(2000) Compression Joints for Vitrified Clay Pipe and Fittings
ASTM C 444	(1995) Perforated Concrete Pipe
ASTM C 478	(1997) Precast Reinforced Concrete Manhole Sections
ASTM C 478M	(1997) Precast Reinforced Concrete Manhole Sections (Metric)
ASTM C 654	(1999) Porous Concrete Pipe
ASTM C 654M	(1999) Porous Concrete Pipe (Metric)
ASTM C 700	(2000) Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated
ASTM D 1751	(1999) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D 1752	(1984; R 1996el) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM D 2751	(1996a) Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings
ASTM D 3034	(1998) Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D 3212	(1996a) Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

ASTM D 3753	(1999) Glass-Fiber-Reinforced Polyester Manholes
ASTM D 5034	(1995) Breaking Strength and Elongation of Textile Fabrics (Grab Test)
ASTM F 405	(1997) Corrugated Polyethylene (PE) Tubing and Fittings
ASTM F 667	(1997) Large Diameter Corrugated Polyethylene Tubing and Fittings
ASTM F 758	(1995) Smooth-Wall Poly(Vinyl Chloride) (PVC) Plastic Underdrain Systems for Highway, Airport, and Similar Drainage
ASTM F 949	(2000) Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings

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-04 Samples

Filter Fabric; [_____], [_____]
Pipe for Subdrains; [_____], [_____]

Samples of filter fabric, pipe, and pipe fittings, before starting the work.

SD-07 Certificates

Filter Fabric; [_____], [_____]
Pipe for Subdrains; [_____], [_____]

Certifications from the manufacturers attesting that materials meet specification requirements. Certificates are required for drain pipe, drain tile, fittings, and filter fabric.

1.3 DELIVER, STORAGE, AND HANDLING

1.3.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with minimum handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. During shipment and storage, filter fabric shall be wrapped in burlap or similar heavy duty protective covering. The storage area shall protect the fabric from mud, soil, dust, and debris. Filter fabric materials that are not to be installed immediately shall not be stored in direct sunlight. Plastic pipe shall be installed within 6 months from the date of manufacture unless otherwise approved.

1.3.2 Handling

Materials shall be handled in such a manner as to insure delivery to the trench in sound undamaged condition. Pipe shall be carried and not dragged to the trench.

1.4 MEASUREMENT AND PAYMENT

1.4.1 Pipe Subdrains

The length of pipe installed will be measured from end to end along the centerlines without any deduction for the diameter of the manholes. Pipe will be paid for according to the number of linear feet of subdrains placed in the accepted work. Payment for bedding and filter materials, except filter fabric, will be included in the payment for the pipe subdrain system.

1.4.2 Blind or French Drains

Blind or french drains will be paid for by the linear footand measured from end to end along the centerlines of the completed drains.

1.4.3 Manholes

Manholes to be paid for will be the number of manholes completed with base, rungs or ladders, frames, and covers or gratings (where specified) constructed in the accepted work.

1.4.4 Flushing and Observation Risers

Flushing and observation risers to be paid for will be the number of flushing and observation risers completed with frames and covers (where specified) constructed in the accepted work.

1.4.5 Filter Fabric

Filter fabric shall be measured for payment by the square [yard] [foot] in place. Overlapped joints and seams shall be measured as a single layer of cloth.

PART 2 PRODUCTS

2.1 PIPE FOR SUBDRAINS

Pipe for subdrains shall be of the types and sizes indicated.

2.1.1 Concrete Pipe

Concrete pipe shall be Class 1, 2, or 3 as indicated and shall conform to ASTM C 14 using ASTM C 150 portland cement Type [II] [V].

2.1.2 Clay Pipe and Perforated Clay Pipe

2.1.2.1 Clay Pipe

Clay pipe shall be either standard or extra strength as indicated and shall conform to ASTM C 700.

2.1.2.2 Perforated Clay Pipe

Perforated clay pipe shall be either standard or extra strength as indicated and shall conform to ASTM C 700. Plain-end pipe conforming to the strength and perforation requirements of ASTM C 700 will also be acceptable if provided with spring wire clips of approved type to maintain a taut but elastic joint between the sections of pipe when laid. Clips shall be constructed of not smaller than No. 9 hard-drawn or oil-tempered steel wire conforming to ASTM A 227/A 227M or ASTM A 229/A 229M, and shall be coated with an approved rust preventive coating. Wire clips shall withstand 25 cycles of alternate loading and unloading using a stressing force of 125 pounds. The permanent set resulting from this test shall be less than 5 percent, based on the original length of the fastener. Compression joints conforming to ASTM C 425 will also be acceptable.

2.1.3 Perforated Concrete Pipe

Perforated concrete pipe shall conform to ASTM C 444, Type [I] [II] perforations and to ASTM C 14, Class 1, 2, or 3 as indicated.

2.1.4 Perforated Corrugated Steel Pipe

Perforated corrugated steel pipe shall conform to ASTM A 760/A 760M, Type III. Sheet thickness of pipe shall be as indicated.

2.1.5 Perforated Corrugated Steel Pipe, Fully Bituminous Coated

Perforated corrugated steel pipe, fully bituminous coated, shall conform to ASTM A 760/A 760M, Type III, with a coating conforming to AASHTO M 190M, Type A. Sheet thickness of pipe shall be as indicated.

2.1.6 Drain Tile

Clay drain tile shall conform to ASTM C 4 standard, extra quality or heavy duty as indicated. Concrete drain tile shall conform to ASTM C 412 standard, extra, heavy duty extra, or special quality as indicated.

2.1.7 Porous Concrete Pipe

Porous concrete pipe shall conform to ASTM C 654, standard or extra strength as indicated and using ASTM C 150 portland cement Type [II] [V].

2.1.8 Perforated Corrugated Aluminum Alloy Pipe

Perforated corrugated aluminum alloy pipe shall conform to ASTM B 745/B 745M, Type III, Class [1] [2]. Sheet thickness of pipe shall be as indicated.

2.1.9 Perforated Corrugated Aluminum Alloy Pipe, Fully Bituminous Coated

Perforated corrugated aluminum alloy pipe, fully bituminous coated shall conform to ASTM B 745/B 745M, Type III, Class [1] [2] with a bituminous coating conforming to AASHTO M 190M, Type A.

2.1.10 Precoated Corrugated Steel Pipe

Precoated corrugated steel pipe shall conform to ASTM A 762/A 762M, Type III.

2.1.11 Plastic Pipe

Plastic pipe shall contain ultraviolet inhibitor to provide protection from exposure to direct sunlight.

2.1.11.1 Acrylonitrile-Butadiene-Styrene (ABS) Piping

Acrylonitrile-butadiene-styrene (ABS) piping and fittings shall conform to ASTM D 2751, with maximum SDR of 35.

2.1.11.2 Polyvinyl Chloride (PVC) Pipe and Fittings

Polyvinyl chloride (PVC) pipe and fittings shall conform to [ASTM D 3034,] [ASTM F 949,] [ASTM F 758, Type PS 46].

2.1.11.3 Corrugated Polyethylene (PE) Pipe and Fittings

Use [ASTM F 405 for pipes 3 to 6 inches in diameter, inclusive, ASTM F 667 for pipes 8 to 24 inches in diameter] [AASHTO M 252M for pipes 3 to 10 inches, AASHTO M 294 for pipes 12 to 24 inches in diameter]. Fittings shall be manufacturer's standard type and shall conform to the indicated specification.

2.1.11.4 Pipe Perforations

Water inlet area shall be a minimum of 0.5 square inch per linear foot. Manufacturer's standard perforated pipe which essentially meets these requirements may be substituted with prior approval of the Contracting Officer.

a. Circular Perforations in Plastic Pipe: Circular holes shall be cleanly cut not more than 3/8 inch) or less than 3/16 inch in diameter and arranged in rows parallel to the longitudinal axis of the pipe. Perforations shall be approximately 3 inches center-to-center along rows. The rows shall be approximately 1-1/2 inches apart and arranged in a staggered pattern so that all perforations lie at the midpoint between perforations in adjacent rows. The rows shall be spaced over not more than 155 degrees of circumference. The spigot or tongue end of the pipe shall not be perforated for a length equal to the depth of the socket, and perforations shall continue at uniform spacing over the entire length of the pipe.

b. Slotted Perforations in Plastic Pipe: Circumferential slots shall be cleanly cut so as not to restrict the inflow of water and uniformly spaced along the length and circumference of the tubing. Width of slots shall not exceed 1/8 inch nor be less than 1/32 inch. The length of individual slots shall not exceed 1-1/4 inches on 3 inch diameter tubing, 10 percent of the tubing inside nominal circumference on 4 to 8 inch diameter tubing, and 2-1/2 inches on 10 inch diameter tubing. Rows of slots shall be symmetrically spaced so that they are fully contained in 2 quadrants of the pipe. Slots shall be centered in the valleys of the corrugations of profile wall pipe.

2.2 FILTER FABRIC

Filter fabric shall be a pervious sheet of polyester, nylon, or polypropylene filaments woven or otherwise formed into a uniform pattern with distinct and measurable openings. The filter fabric shall provide an equivalent opening size (AOS) no finer than the US Standard Sieve No.

[_____] and no coarser than the US Standard Sieve No. [_____]. AOS is defined as the number of the US Standard sieve having openings closest in size to the filter fabric openings. [The percent open area provided shall not be less than [_____] percent and not more than [_____] percent. Percent open area is defined as the summation of open areas divided by the total area of the filter fabric and expressed as a percent.] [The filaments shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of propylene, ethylene, or vinylidene-chloride, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultraviolet and heat exposure.] The fabric shall have a minimum physical strength of [_____] pounds per inch in any direction when tested in accordance with ASTM D 5034using the grab test method with 1 square inch jaws and a constant rate of travel of 12 inches per minute. Elongation at failure shall be between [30] [_____] and [70] [_____] percent. The fabric shall be constructed so that the filaments will retain their relative position with respect to each other. [The edges of the fabric shall be selvaged or otherwise finished to prevent the outer material from pulling away from the fabric.] [The fabric shall be woven into a width that may be installed as shown without longitudinal seams.]

2.3 DRAINAGE STRUCTURES

2.3.1 Concrete

Except for precast concrete, reinforcement shall conform to the requirements for [3,000] [_____] psi concrete in Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE. The concrete mixtures shall have air content, by volume of concrete, based on measurements made immediately after discharge from the mixer of [5 to 7] [3 to 6] percent when coarse-aggregate maximum size is 1-1/2 inches or smaller. Air content shall be determined in accordance with ASTM C 231. The concrete covering over steel reinforcing shall be not less than 1 inch thick for covers and not less than 1-1/2 inches thick for walls and flooring. Concrete covering deposited directly against the ground shall be at least 3 inches thick between the steel and the ground. Expansion-joint filler material shall conform to ASTM D 1751 or ASTM D 1752. Exposed concrete surfaces, such as drainage structures that form a continuation of concrete curbs and gutters, shall be given a protective coating of linseed oil as specified in Section 02770CONCRETE SIDEWALKS AND CURBS AND GUTTERS.

2.3.2 Mortar

Mortar for pipe joints and connections to other drainage structures shall be composed of one part by volume of portland cement and two parts of sand. The quantity of water in the mixture shall be sufficient to produce a stiff workable mortar. Water shall be clean and free of injurious acids, alkalies, and organic impurities. The mortar shall be used within 30 minutes from the time the ingredients are mixed with water.

2.3.3 Manholes and Appurtenances

2.3.3.1 Precast Reinforced Concrete Manhole Risers and Tops

Precast reinforced concrete manhole risers and tops shall conform to ASTM C 478.

2.3.3.2 Precast Concrete Segmental Blocks

Precast concrete segmental blocks shall conform to ASTM C 139 and shall be not more than 8 inches thick, not less than 8 inches long, and of such shape that the joints can be effectively sealed and bonded with cement mortar.

2.3.3.3 Precast Concrete Manhole Bases

If precast concrete manhole bases are used, the bases shall conform to ASTM C 478 and shall be of such a design as to effect suitable connection with influent and effluent lines and to provide a suitable base structure for riser sections.

2.3.3.4 Brick

Brick shall conform to ASTM C 62, Grade SW, or ASTM C 55, Grade S-I or S-II. Mortar for jointing and plastering shall consist of one part portland cement and two parts fine sand. Lime may be added to the mortar in the amount of not more than 25 percent by volume of cement.

2.3.3.5 Prefabricated Corrugated Metal

Steel manholes and risers shall be fabricated of at least [_____] gauge galvanized [and bituminous coated] corrugated metal.

2.3.3.6 Glass Fiber-Reinforced Polyester (FRP)

FRP manholes shall conform to ASTM D 3753.

2.3.3.7 Frames and Covers or Gratings

Frames and gratings, or frames and covers, except as otherwise permitted, shall be of either cast iron with tensile strength test not less than ASTM A 48 Class 25 or steel conforming to ASTM A 27/A 27M, Class 65-35. Weight, shape, and size shall be as indicated. Frames and covers not subjected to vehicular traffic or storage may be of malleable iron where indicated. The malleable-iron frames and covers shall conform to ASTM A 47/A 47M and shall be of the weight, shape, and size indicated.

2.3.3.8 Steel Ladder

A steel ladder shall be provided where the depth of a manhole exceeds 12 feet. The ladder will be not less than 16 inches in width, with 3/4 inch diameter rungs spaced 12 inches apart. The two stringers shall be a minimum 3/8 inchthick and 2 inches wide. Ladder shall be adequately anchored to the wall by means of steel inserts spaced not more than 6 feet apart vertically, and shall be so installed as to provide at least 6 inches of space between the wall and the rungs. Ladders and inserts shall be galvanized after fabrication in conformance with ASTM A 123/A 123M. The wall along the line of the ladder shall be vertical for its entire length.

2.4 SUBDRAIN FILTER AND BEDDING MATERIAL

Subdrain filter and bedding material shall be washed sand, sand and gravel, crushed stone, crushed stone screenings, or slag composed of hard, tough, durable particles free from adherent coatings. Filter material shall not contain corrosive agents, organic matter, or soft, friable, thin, or elongated particles and shall be evenly graded between the limits specified in TABLE I. Gradation curves will exhibit no abrupt changes in slope denoting skip or gap grading. Filter materials shall be clean and free

from soil and foreign materials. Filter blankets found to be dirty or otherwise contaminated shall be removed and replaced with material meeting the specific requirements, at no additional cost to the Government.

TABLE I. FILTER GRADATION

Sieve Designation	Percent by Weight Passing		
	Gradation A	Gradation B	Gradation C

PART 3 EXECUTION

3.1 EXCAVATION AND BEDDING FOR SUBDRAIN SYSTEMS

Trenching and excavation, including the removal of rock and unstable material, shall be in accordance with Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS. Bedding material shall be placed in the trench as indicated or as required as replacement materials used in those areas where unstable materials were removed. Compaction of the bedding material shall be as specified for cohesionless material in Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

3.2 MANHOLES AND FLUSHING AND OBSERVATION RISERS

3.2.1 Manholes

Manholes shall be installed complete with frames and covers or gratings at the locations and within the limits and sizes indicated. Manholes shall be constructed of one of the materials specified for manholes in paragraph DRAINAGE STRUCTURES. Joints shall be completely filled and shall be smooth and free of surplus mortar or mastic on the inside of the structure. Brick manholes shall be plastered with 1/2 inch of mortar over the entire outside surface of the walls. Brick for square or rectangular structures shall be laid in stretcher courses with a header course every sixth course. Brick for round structures shall be laid radially with every sixth course laid as a stretcher course. Ladders shall be installed in manholes as indicated. Base for manholes shall be either precast or cast-in-place concrete.

3.2.2 Flushing and Observation Risers

Flushing and observation riser pipes with frames and covers shall be installed at the locations indicated. Risers shall be constructed of precast concrete, vitrified clay, or [galvanized] [bituminous coated] corrugated metal pipe. Joining of riser pipes to the subdrain system shall be as indicated.

3.3 INSTALLATION OF FILTER FABRIC AND PIPE FOR SUBDRAINS

3.3.1 Installation of Filter Fabric

3.3.1.1 Overlaps on Perforated or Slotted Pipes

One layer of filter fabric shall be wrapped around perforated or slotted collector pipes in such a manner that longitudinal overlaps of fabric are in unperforated or unslotted quadrants of the pipes. The overlap shall be at least 2 inches. The fabric shall be secured to the pipe in such a manner that backfill material will not infiltrate through any fabric overlaps.

3.3.1.2 Installation on Open-Joint Pipe

One layer of filter fabric shall be wrapped around open joints. The overlap should be at least 2 inches. The fabric shall be secured to the pipe in such a manner that backfill material will not infiltrate through the overlap or the edges of the fabric to either side of the open joint.

3.3.1.3 Trench Lining and Overlaps

Trenches to be lined with filter fabric shall be graded to obtain smooth side and bottom surfaces so that the fabric will not bridge cavities in the soil or be damaged by projecting rock. The fabric shall be laid flat but not stretched on the soil, and it shall be secured with anchor pins. Overlaps shall be at least [_____] inches, and anchor pins shall be used along the overlaps.

3.3.2 Installation of Pipe for Subdrains

3.3.2.1 Pipelaying

Each pipe shall be carefully inspected before it is laid. Any defective or damaged pipe shall be rejected. No pipe shall be laid when the trench conditions or weather is unsuitable for such work. Water shall be removed from trenches by sump pumping or other approved methods. The pipe shall be laid to the grades and alignment as indicated. The pipe shall be bedded to the established gradeline. Perforations shall be centered on the bottom of the pipe. Pipes of either the bell-and-spigot type or the tongue-and-groove type shall be laid with the bell or groove ends upstream. All pipes in place shall be approved before backfilling.

3.3.2.2 Jointings

a. Nonperforated Concrete and Clay Pipe: Pipe shall be laid with 1/8 to 1/4 inch opening between the ends of the pipe or as required by spacing lugs constructed in the pipe. Mortar shall be placed in the joint at three points and pressed firmly into place to hold the pipe securely in line. The mortar shall be the full depth of the bell or groove and approximately 1 inch in width, and shall be located at the third points around the joint with the top point at the center of the pipe. The inside of the pipe shall be free of excess mortar.

b. Perforated Concrete and Clay Pipe: The pipe shall be laid with closed joints with positive provision for centering each section of the pipe in the bell or groove of the previously placed section. Plain-end perforated clay pipe sections shall be securely fastened together with spring wire clips furnished by the pipe manufacturer.

c. Perforated Corrugated Metal Pipe or Bituminous Coated, Perforated Corrugated Metal Pipe: The sections of perforated corrugated metal pipe or bituminous coated, perforated corrugated metal pipe shall be securely fastened together with standard connecting bands furnished by the manufacturer of the pipe.

d. Drain Tile: Drain tile shall be bedded as provided for bell-and-spigot or tongue-and-groove types of pipe and laid with open joints of approximately 1/8 inch width but not over 1/4 inch width. Drain tile shall be protected against the entrance of filter material into the line by the use of filter fabric.

e. Porous Concrete Pipe: Porous concrete pipe shall be installed with mortar joints.

f. Perforated Asbestos-Cement Pipe: Couplings shall be of the sleeve type suitable for holding the pipe firmly in alignment without the use of sealing compounds or gaskets. Tapered couplings will be acceptable.

g. Bituminous Coated or Uncoated Semicircular Steel Pipe: Coupling bands shall consist of an uncorrugated top and bottom section fabricated to fit around two adjacent pieces of pipe. Coupling bands shall be bolted together with four bolts.

h. Bituminous Coated or Uncoated Corrugated Aluminum Pipe: If aluminum pipe is to be connected to dissimilar metal, the connection shall be insulated by bituminous coating or other nonconductive material. Standard joints between corrugated aluminum pipe shall be securely fastened with standard connecting bands furnished by the manufacturer of the pipe.

i. Acrylonitrile-Butadiene-Styrene (ABS): Solvent cement or elastomeric joints for ABS pipe shall be in accordance with ASTM D 2751. Dimensions and tolerances shall be in accordance with TABLE II of ASTM D 2751.

j. Polyvinyl Chloride (PVC) Pipe: Joints shall be in accordance with the requirements of ASTM D 3034, ASTM D 3212, or ASTM F 949.

k. Perforated Corrugated Polyethylene Pipe: Perforated corrugated polyethylene drainage pipe shall be installed in accordance with the manufacturer's specifications and as specified herein. A pipe with physical imperfections shall not be installed. No more than 5 percent stretch in a section will be permitted.

3.4 INSTALLATION OF AND BACKFILLING FOR BLIND OR FRENCH DRAINS

Filter material shall be placed as indicated and compacted as specified for cohesionless materials in Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS. Filter material shall extend to a suitable outlet or to an outlet through a pipeline as indicated. Overlying backfill material shall be placed and compacted as specified in Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

3.5 INSTALLATION OF FILTER MATERIAL AND BACKFILLING FOR SUBDRAINS

After pipe for subdrains has been laid, inspected, and approved, filter material shall be placed around and over the pipe to the depth indicated. The filter material shall be placed in layers not to exceed 8 inches thick, and each layer shall be [saturated by flooding] [thoroughly compacted by mechanical tampers or rammers] to obtain the required density. Compaction of filter material and the placement and compaction of overlying backfill material shall be in accordance with the applicable provisions specified in Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

3.6 TESTS

3.6.1 Pipe Test

Strength tests of pipe shall conform to field service test requirements of the Federal Specification, ASTM specification, or AASHTO specification covering the product (paragraph PIPE FOR SUBDRAINS).

3.6.2 JP-4 Fuel Resistance Test

Five unaged fabric samples, 4 (plus or minus 0.2) by 6 (plus or minus 0.2) inches shall be immersed in JP-4 fuel at room temperature for a period of 7 days. Each sample then shall be tested for tensile strength and elongation in accordance with ASTM D 5034. The strength of the fabric in any direction shall be no less than 85 percent of the strength specified in paragraph FILTER FABRIC.

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STORM-DRAINAGE SYSTEM
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ACI INTERNATIONAL (ACI)

ACI 346/346R	(1990) Standard Specification for Cast-in-Place Nonreinforced Concrete Pipe and Recommendations

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO HB-16	(1996) Standard Specifications for Highway Bridges
AASHTO M 167	(1994) Corrugated Steel Structural Plate, Zinc Coated, for Field Bolted Pipe
AASHTO M 190	(1995) Bituminous Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M 198	(1998) Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets
AASHTO M 219	(1992; R 1995) Aluminum Alloy Structural Plate for Field Bolted Conduits
AASHTO M 243	(1996) Field Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches
AASHTO M 294	(1998) Corrugated Polyethylene Pipe, 300- to 1200- mm Diameter
AASHTO MP 7	(1997) Corrugated Polyethylene Pipe, 1350 and 1500 mm Diameter

AMERICAN RAILWAY ENGINEERING & MAINTENANCE-OF-WAY ASSOCIATION (AREMA)

AREMA Manual	(1999) Manual for Railway Engineering (4 Vol.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 48	(1994a) Gray Iron Castings
ASTM A 48M	(1994 el) Gray Iron Castings (Metric)
ASTM A 123/A 123M	(1997ael) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 536	(1999el) Ductile Iron Castings
ASTM A 716	(1995) Ductile Iron Culvert Pipe
ASTM A 742/A 742M	(1998) Steel Sheet, Metallic Coated and Polymer Precoated for Corrugated Steel Pipe
ASTM A 760/A 760M	(1997) Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains
ASTM A 762/A 762M	(1998) Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains
ASTM A 798/A 798M	(1997a) Installing Factory-Made Corrugated Steel Pipe for Sewers and Other Applications
ASTM A 807	(1997) Installing Corrugated Steel Structural Plate Pipe for Sewers and Other Applications
ASTM A 849	(1997) Post-Applied Coatings, Pavings, and Linings for Corrugated Steel Sewer and Drainage Pipe
ASTM A 929/A 929M	(1997) Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe
ASTM B 26/B 26M	(1998) Aluminum-Alloy Sand Castings
ASTM B 745/B 745M	(1997) Corrugated Aluminum Pipe for Sewers and Drains
ASTM C 12	(1998el) Installing Vitrified Clay Pipe Lines
ASTM C 14	(1999) Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C 14M	(1999) Concrete Sewer, Storm Drain, and Culvert Pipe (Metric)
ASTM C 32	(1999el) Sewer and Manhole Brick (Made from Clay or Shale)
ASTM C 55	(1999) Concrete Brick
ASTM C 62	(1997a) Building Brick (Solid Masonry Units Made from Clay or Shale)
ASTM C 76	(1999) Reinforced Concrete Culvert, Storm

	Drain, and Sewer Pipe
ASTM C 76M	(1999a) Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe (Metric)
ASTM C 139	(1999) Concrete Masonry Units for Construction of Catch Basins and Manholes
ASTM C 231	(1997el) Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 270	(1997) Mortar for Unit Masonry
ASTM C 425	(1998b) Compression Joints for Vitrified Clay Pipe and Fittings
ASTM C 443	(1998) Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
ASTM C 443M	(1998) Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets (Metric)
ASTM C 478	(1997) Precast Reinforced Concrete Manhole Sections
ASTM C 478M	(1997) Precast Reinforced Concrete Manhole Sections (Metric)
ASTM C 506	(1999) Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
ASTM C 506M	(1999) Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe (Metric)
ASTM C 507	(1999) Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe
ASTM C 507M	(1999) Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe (Metric)
ASTM C 655	(1995a) Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe
ASTM C 700	(1999) Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated
ASTM C 789	(1998) Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers
ASTM C 828	(1998) Low-Pressure Air Test of Vitrified Clay Pipe Lines
ASTM C 850	(1998) Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers with Less Than 2 Ft. of Cover Subjected to Highway Loadings

ASTM C 877	(1994) External Sealing Bands for Noncircular Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C 877M	(1994) External Sealing Bands for Noncircular Concrete Sewer, Storm Drain, and Culvert Pipe (Metric)
ASTM C 923	(1998) Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Materials
ASTM C 924	(1998) Concrete Pipe Sewer Lines by Low-Pressure Air Test Method
ASTM C 924M	(1998) Concrete Pipe Sewer Lines by Low-Pressure Air Test Method (Metric)
ASTM C 1103	(1994) Joint Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines
ASTM C 1103M	(1994) Joint Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines (Metric)
ASTM D 1056	(1998) Flexible Cellular Materials - Sponge or Expanded Rubber
ASTM D 1171	(1994) Rubber Deterioration - Surface Ozone Cracking Outdoors or Chamber (Triangular Specimens)
ASTM D 1557	(1998) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu.m.))
ASTM D 1751	(1999) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D 1752	(1984; R 1996el) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM D 1784	(1999a) Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D 2167	(1994) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2321	(1989; R 1995) Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D 2922	(1996el) Density of Soil and

	Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(1988; R 1996el) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 3034	(1998) Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D 3212	(1996a) Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM D 3350	(1998a) Polyethylene Plastics Pipe and Fittings Materials
ASTM F 477	(1999) Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F 679	(1995) Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
ASTM F 714	(1997) Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
ASTM F 794	(1999) Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
ASTM F 894	(1998a) Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
ASTM F 949	(1999) Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
ASTM F 1417	(1992; R 1998) Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air

1.2 MEASUREMENT AND PAYMENT

1.2.1 Pipe Culverts and Storm Drains

The length of pipe installed will be measured along the centerlines of the pipe from end to end of pipe without deductions for diameter of manholes. Pipe will be paid for at the contract unit price for the number of linear feet of culverts or storm drains placed in the accepted work.

1.2.2 Manholes and Inlets

The quantity of manholes and inlets will be measured as the total number of manholes and inlets of the various types of construction, complete with frames and gratings or covers and, where indicated, with fixed side-rail ladders, constructed to the depth of [_____] feet, in the accepted work. The depth of manholes and inlets will be measured from the top of grating or cover to invert of outlet pipe. Manholes and inlets constructed to depths greater than the depth specified above will be paid for as units at

the contract unit price for manholes and inlets, plus an additional amount per linear foot for the measured depth beyond a depth of [_____] feet.

1.2.3 Walls and Headwalls

Walls and headwalls will be measured by the number of cubic yards of reinforced concrete, plain concrete, or masonry used in the construction of the walls and headwalls. Wall and headwalls will be paid for at the contract unit price for the number of walls and headwalls constructed in the completed work.

1.2.4 Flared End Sections

Flared end sections will be measured by the unit. Flared end sections will be paid for at the contract unit price for the various sizes in the accepted work.

1.2.5 Sheeting and Bracing

Payment will be made for that sheeting and bracing ordered to be left in place, based on the number of square feet of sheeting and bracing remaining below the surface of the ground.

1.2.6 Rock Excavation

Payment will be made for the number of cubic yards of material acceptably excavated, as specified and defined as rock excavation in Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS measured in the original position, and computed by allowing actual width of rock excavation with the following limitations: maximum rock excavation width, 30 inches for pipe of 12 inch or less nominal diameter; maximum rock excavation width, 16 inches greater than outside diameter of pipe of more than 12 inch nominal diameter. Measurement will include authorized overdepth excavation. Payment will also include all necessary drilling and blasting, and all incidentals necessary for satisfactory excavation and disposal of authorized rock excavation. No separate payment will be made for backfill material required to replace rock excavation; this cost shall be included in the Contractor's unit price bid per cubic yard for rock excavation. In rock excavation for manholes and other appurtenances, 1 foot will be allowed outside the wall lines of the structures.

1.2.7 Backfill Replacing Unstable Material

Payment will be made for the number of cubic yards of select granular material required to replace unstable material for foundations under pipes or drainage structures, which will constitute full compensation for this backfill material, including removal and disposal of unstable material and all excavating, hauling, placing, compacting, and all incidentals necessary to complete the construction of the foundation satisfactorily.

1.2.8 Pipe Placed by Jacking

Payment will be made for the number of linear feet of jacked pipe accepted in the completed work measured along the centerline of the pipe in place.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When

used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Placing Pipe; [_____], [_____]

Printed copies of the manufacturer's recommendations for installation procedures of the material being placed, prior to installation.

SD-04 Samples

Pipe for Culverts and Storm Drains; [_____], [_____]

Samples of the following materials, before work is started: [_____].

SD-07 Certificates

Resin Certification; [_____], [_____]
Pipeline Testing; [_____], [_____]
Hydrostatic Test on Watertight Joints; [_____], [_____]
Determination of Density; [_____], [_____]
Frame and Cover for Gratings; [_____], [_____]

Certified copies of test reports demonstrating conformance to applicable pipe specifications, before pipe is installed. Certification on the ability of frame and cover or gratings to carry the imposed live load.

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. Before, during, and after installation, plastic pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions unless directed otherwise by the Contracting Officer. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install plastic pipe shall be stored in accordance with the manufacturer's recommendations and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.4.2 Handling

Materials shall be handled in a manner that ensures delivery to the trench in sound, undamaged condition. Pipe shall be carried to the trench, not dragged.

PART 2 PRODUCTS

2.1 PIPE FOR CULVERTS AND STORM DRAINS

Pipe for culverts and storm drains shall be of the sizes indicated and shall conform to the requirements specified.

2.1.1 Concrete Pipe

ASTM C 76, Class [I] [II] [III] [IV] [V], or ASTM C 655, [_____] D-Load.

2.1.1.1 Reinforced Arch Culvert and Storm Drainpipe

ASTM C 506, Class [A-II] [A-III] [A-IV].

2.1.1.2 Reinforced Elliptical Culvert and Storm Drainpipe

ASTM C 507. Horizontal elliptical pipe shall be Class [HE-A] [HE-I] [HE-II] [HE-III] [HE-IV]. Vertical elliptical pipe shall be Class [VE-II] [VE-III] [VE-IV] [VE-V] [VE-VI].

2.1.1.3 Nonreinforced Pipe

ASTM C 14, Class [1] [2] [3].

2.1.1.4 Cast-In-Place Nonreinforced Conduit

ACI 346/346R, except that testing shall be the responsibility of and at the expense of the Contractor. In the case of other conflicts between ACI 346/346R and project specifications, requirements of ACI 346/346R shall govern.

2.1.2 Clay Pipe

Standard or extra strength, as indicated, conforming to ASTM C 700.

2.1.3 Corrugated Steel Pipe

ASTM A 760/A 760M, zinc or aluminum (Type 2) coated pipe of either:

a. Type [I] [II] pipe with [annular] [helical] 2-2/3 by 1/2 inch corrugations.

b. Type [IR] [IIR] pipe with helical 3/4 by 3/4 by 7-1/2 inch corrugations.

2.1.3.1 Fully Bituminous Coated

AASHTO M 190 Type A and ASTM A 760/A 760M zinc or aluminum (Type 2) coated pipe of either:

a. Type [I] [II] pipe with [annular] [helical] 2-2/3 by 1/2 inch corrugations.

b. Type [IR] [IIR] pipe with helical 3/4 by 3/4 by 7-1/2 inch corrugations.

2.1.3.2 Half Bituminous Coated, Part Paved

AASHTO M 190 Type B and ASTM A 760/A 760M zinc or aluminum (Type 2) coated Type [I] [II] pipe with [annular] [helical] 2-2/3 by 1/2 inch corrugations.

2.1.3.3 Fully Bituminous Coated, Part Paved

AASHTO M 190 Type C and ASTM A 760/A 760M zinc or aluminum (Type 2) coated Type [I] [II] pipe with [annular] [helical] 2-2/3 by 1/2 inch corrugations.

2.1.3.4 Fully Bituminous Coated, Fully Paved

AASHTO M 190 Type D and ASTM A 760/A 760M zinc or aluminum (Type 2) coated Type [I] [II] pipe with [annular] [helical] 2-2/3 by 1/2 inch corrugations.

2.1.3.5 Concrete-Lined

ASTM A 760/A 760M zinc coated Type I corrugated steel pipe with [annular] [helical] 2-2/3 by 1/2 inch corrugations and a concrete lining in accordance with ASTM A 849.

2.1.3.6 Polymer Precoated

ASTM A 762/A 762M corrugated steel pipe fabricated from ASTM A 742/A 742M Grade 10/10 polymer precoated sheet of either:

a. Type [I] [II] pipe with [annular] [helical] 2-2/3 by 1/2 inch corrugations.

b. Type [IR] [IIR] pipe with helical 3/4 by 3/4 by 7-1/2 inch corrugations.

2.1.3.7 Polymer Precoated, Part Paved

ASTM A 762/A 762M Type [I] [II] corrugated steel pipe and AASHTO M 190 Type B (modified), paved invert only, fabricated from ASTM A 742/A 742M Grade 10/10 polymer precoated sheet with [annular] [helical] 2-2/3 by 1/2 inch corrugations.

2.1.3.8 Polymer Precoated, Fully Paved

ASTM A 762/A 762M Type [I] [II] corrugated steel pipe and AASHTO M 190 Type D (modified), fully paved only, fabricated from ASTM A 742/A 742M Grade 10/10 polymer precoated sheet with [annular] [helical] 2-2/3 by 1/2 inch corrugations.

2.1.4 Corrugated Aluminum Alloy Pipe

ASTM B 745/B 745M corrugated aluminum alloy pipe of either:

a. Type [I] [II] pipe with [annular] [helical] corrugations.

b. Type [IA] [IR] [IIA] [IIR] pipe with helical corrugations.

2.1.4.1 Aluminum Fully Bituminous Coated

AASHTO M 190 Type A and ASTM B 745/B 745M corrugated aluminum alloy pipe of either:

a. Type [I] [II] pipe with [annular] [helical] corrugations.

b. Type [IA] [IR] [IIA] [IIR] pipe with helical corrugations.

2.1.4.2 Aluminum Fully Bituminous Coated, Part Paved

AASHTO M 190 Type C and ASTM B 745/B 745M corrugated aluminum alloy pipe of either:

a. Type [I] [II] pipe with [annular] [helical] corrugations.

b. Type [IR] [IIR] pipe with helical corrugations.

2.1.5 Structural Plate, Steel Pipe, Pipe Arches and Arches

Assembled with galvanized steel nuts and bolts, from galvanized corrugated steel plates conforming to AASHTO M 167. Pipe coating, when required, shall conform to the requirements of [AASHTO M 190 Type A] [AASHTO M 243]. Thickness of plates shall be as indicated.

2.1.6 Structural Plate, Aluminum Pipe, Pipe Arches and Arches

Assembled with either aluminum alloy, aluminum coated steel, stainless steel or zinc coated steel nuts and bolts. Nuts and bolts, and aluminum alloy plates shall conform to AASHTO M 219. Pipe coating, when required, shall conform to the requirements of [AASHTO M 190, Type A] [AASHTO M 243]. Thickness of plates shall be as indicated.

2.1.7 Ductile Iron Culvert Pipe

ASTM A 716.

2.1.8 PVC Pipe

The pipe manufacturer's resin certification, indicating the cell classification of PVC used to manufacture the pipe, shall be submitted prior to installation of the pipe.

2.1.8.1 Type PSM PVC Pipe

ASTM D 3034, Type PSM, maximum SDR 35, produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.1.8.2 Profile PVC Pipe

ASTM F 794, Series 46, produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.1.8.3 Smooth Wall PVC Pipe

ASTM F 679 produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.1.8.4 Corrugated PVC Pipe

ASTM F 949 produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.1.9 PE Pipe

The pipe manufacturer's resin certification indicating the cell

classification of PE used to manufacture the pipe shall be submitted prior to installation of the pipe. The minimum cell classification for polyethylene plastic shall apply to each of the seven primary properties of the cell classification limits in accordance with ASTM D 3350.

2.1.9.1 Smooth Wall PE Pipe

ASTM F 714, maximum DR of 21 for pipes 3 to 24 inches in diameter and maximum DR of 26 for pipes 26 to 48 inches in diameter. Pipe shall be produced from PE certified by the resin producer as meeting the requirements of ASTM D 3350, minimum cell class 335434C.

2.1.9.2 Corrugated PE Pipe

AASHTO M 294, Type S or D, for pipes 12 to 48 inches and AASHTO MP 7, Type S or D, for pipes 54 to 60 inches produced from PE certified by the resin producer as meeting the requirements of ASTM D 3350, minimum cell class in accordance with AASHTO M 294. Pipe walls shall have the following properties:

Nominal Size (in.)	Minimum Wall Area (square in/ft)	Minimum Moment of Inertia of Wall Section (in to the 4th/in)
12	1.50	0.024
15	1.91	0.053
18	2.34	0.062
24	3.14	0.116
30	3.92	0.163
36	4.50	0.222
42	4.69	0.543
48	5.15	0.543
54	5.67	0.800
60	6.45	0.800

2.1.9.3 Profile Wall PE Pipe

ASTM F 894, RSC 160, produced from PE certified by the resin producer as meeting the requirements of ASTM D 3350, minimum cell class 334433C. Pipe walls shall have the following properties:

		Minimum Moment Of Inertia of Wall Section (in to the 4th/in)	
Nominal Size (in.)	Minimum Wall Area (square in/ft)	Cell Class 334433C	Cell Class 335434C
18	2.96	0.052	0.038
21	4.15	0.070	0.051
24	4.66	0.081	0.059
27	5.91	0.125	0.091
30	5.91	0.125	0.091

Nominal Size (in.)	Minimum Wall Area (square in/ft)	Minimum Moment Of Inertia of Wall Section (in to the 4th/in) Cell Class 334433C	Cell Class 335434C
33	6.99	0.161	0.132
36	8.08	0.202	0.165
42	7.81	0.277	0.227
48	8.82	0.338	0.277

2.2 DRAINAGE STRUCTURES

2.2.1 Flared End Sections

Sections shall be of a standard design fabricated from zinc coated steel sheets meeting requirements of ASTM A 929/A 929M.

2.2.2 Precast Reinforced Concrete Box

For highway loadings with 2 feet of cover or more or subjected to dead load only, ASTM C 789; for less than 2 feet of cover subjected to highway loading, ASTM C 850.

2.3 MISCELLANEOUS MATERIALS

2.3.1 Concrete

Unless otherwise specified, concrete and reinforced concrete shall conform to the requirements for [_____] psi concrete under Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE. The concrete mixture shall have air content by volume of concrete, based on measurements made immediately after discharge from the mixer, of 5 to 7 percent when maximum size of coarse aggregate exceeds 1-1/2 inches. Air content shall be determined in accordance with ASTM C 231. The concrete covering over steel reinforcing shall not be less than 1 inch thick for covers and not less than 1-1/2 inches thick for walls and flooring. Concrete covering deposited directly against the ground shall have a thickness of at least 3 inches between steel and ground. Expansion-joint filler material shall conform to ASTM D 1751, or ASTM D 1752, or shall be resin-impregnated fiberboard conforming to the physical requirements of ASTM D 1752.

2.3.2 Mortar

Mortar for pipe joints, connections to other drainage structures, and brick or block construction shall conform to ASTM C 270, Type M, except that the maximum placement time shall be 1 hour. The quantity of water in the mixture shall be sufficient to produce a stiff workable mortar but in no case shall exceed [_____] gallons of water per sack of cement. Water shall be clean and free of harmful acids, alkalies, and organic impurities. The mortar shall be used within 30 minutes after the ingredients are mixed with water. The inside of the joint shall be wiped clean and finished smooth. The mortar head on the outside shall be protected from air and sun with a proper covering until satisfactorily cured.

2.3.3 Precast Concrete Segmental Blocks

Precast concrete segmental block shall conform to ASTM C 139, not more than 8 inches thick, not less than 8 inches long, and of such shape that joints can be sealed effectively and bonded with cement mortar.

2.3.4 Brick

Brick shall conform to ASTM C 62, Grade SW; ASTM C 55, Grade S-I or S-II; or ASTM C 32, Grade MS. Mortar for jointing and plastering shall consist of one part portland cement and two parts fine sand. Lime may be added to the mortar in a quantity not more than 25 percent of the volume of cement. The joints shall be filled completely and shall be smooth and free from surplus mortar on the inside of the structure. Brick structures shall be plastered with 1/2 inch of mortar over the entire outside surface of the walls. For square or rectangular structures, brick shall be laid in stretcher courses with a header course every sixth course. For round structures, brick shall be laid radially with every sixth course a stretcher course.

2.3.5 Precast Reinforced Concrete Manholes

Precast reinforced concrete manholes shall conform to ASTM C 478. Joints between precast concrete risers and tops shall be [full-bedded in cement mortar and shall be smoothed to a uniform surface on both interior and exterior of the structure] [made with flexible watertight, rubber-type gaskets meeting the requirements of paragraph JOINTS].

2.3.6 Prefabricated Corrugated Metal Manholes

Manholes shall be of the type and design recommended by the manufacturer. Manholes shall be complete with frames and cover, or frames and gratings.

2.3.7 Frame and Cover for Gratings

Frame and cover for gratings shall be cast gray iron, ASTM A 48, Class 35B; cast ductile iron, ASTM A 536, Grade 65-45-12; or cast aluminum, ASTM B 26/B 26M, Alloy 356.OT6. Weight, shape, size, and waterway openings for grates and curb inlets shall be as indicated on the plans.

2.3.8 Joints

2.3.8.1 Flexible Watertight Joints

a. Materials: Flexible watertight joints shall be made with plastic or rubber-type gaskets for concrete pipe and with factory-fabricated resilient materials for clay pipe. The design of joints and the physical requirements for plastic gaskets shall conform to AASHTO M 198, and rubber-type gaskets shall conform to ASTM C 443. Factory-fabricated resilient joint materials shall conform to ASTM C 425. Gaskets shall have not more than one factory-fabricated splice, except that two factory-fabricated splices of the rubber-type gasket are permitted if the nominal diameter of the pipe being gasketed exceeds 54 inches.

b. Test Requirements: Watertight joints shall be tested and shall meet test requirements of paragraph HYDROSTATIC TEST ON WATERTIGHT JOINTS. Rubber gaskets shall comply with the oil resistant gasket

requirements of ASTM C 443. Certified copies of test results shall be delivered to the Contracting Officer before gaskets or jointing materials are installed. Alternate types of watertight joint may be furnished, if specifically approved.

2.3.8.2 External Sealing Bands

Requirements for external sealing bands shall conform to ASTM C 877.

2.3.8.3 Flexible Watertight, Gasketed Joints

a. Gaskets: When infiltration or exfiltration is a concern for pipe lines, the couplings may be required to have gaskets. The closed-cell expanded rubber gaskets shall be a continuous band approximately 7 inches wide and approximately 3/8 inch thick, meeting the requirements of ASTM D 1056, Type 2 [A1] [B3] [_____], and shall have a quality retention rating of not less than 70 percent when tested for weather resistance by ozone chamber exposure, Method B of ASTM D 1171. Rubber O-ring gaskets shall be 13/16 inch in diameter for pipe diameters of 36 inches or smaller and 7/8 inch in diameter for larger pipe having 1/2 inch deep end corrugation. Rubber O-ring gaskets shall be 1-3/8 inches in diameter for pipe having 1 inch deep end corrugations. O-rings shall meet the requirements of AASHTO M 198 or ASTM C 443. Flexible plastic gaskets shall conform to requirements of AASHTO M 198, Type B.

b. Connecting Bands: Connecting bands shall be of the type, size and sheet thickness of band, and the size of angles, bolts, rods and lugs as indicated or where not indicated as specified in the applicable standards or specifications for the pipe. Exterior rivet heads in the longitudinal seam under the connecting band shall be countersunk or the rivets shall be omitted and the seam welded. Watertight joints shall be tested and shall meet the test requirements of paragraph HYDROSTATIC TEST ON WATERTIGHT JOINTS.

2.3.8.4 PVC Plastic Pipes

Joints shall be solvent cement or elastomeric gasket type in accordance with the specification for the pipe and as recommended by the pipe manufacturer.

2.3.8.5 Smooth Wall PE Plastic Pipe

Pipe shall be joined using butt fusion method as recommended by the pipe manufacturer.

2.3.8.6 Corrugated PE Plastic Pipe

Water tight joints shall be made using a PVC or PE coupling and rubber gaskets as recommended by the pipe manufacturer. Rubber gaskets shall conform to ASTM F 477. Soil tight joints shall conform to the requirements in AASHTO HB-16, Division II, Section 26.4.2.4. (e) for soil tightness and shall be as recommended by the pipe manufacturer.

2.3.8.7 Profile Wall PE Plastic Pipe

Joints shall be gasketed or thermal weld type with integral bell in accordance with ASTM F 894.

2.3.8.8 Ductile Iron Pipe

Couplings and fittings shall be as recommended by the pipe manufacturer.

2.4 STEEL LADDER

Steel ladder shall be provided where the depth of the manhole exceeds 12 feet. These ladders shall be not less than 16 inches in width, with 3/4 inch diameter rungs spaced 12 inches apart. The two stringers shall be a minimum 3/8 inch thick and 2-1/2 inches wide. Ladders and inserts shall be galvanized after fabrication in conformance with ASTM A 123/A 123M.

2.5 DOWNSPOUT BOOTS

Boots used to connect exterior downspouts to the storm-drainage system shall be of gray cast iron conforming to ASTM A 48, Class 30B or 35B. Shape and size shall be as indicated.

2.6 RESILIENT CONNECTORS

Flexible, watertight connectors used for connecting pipe to manholes and inlets shall conform to ASTM C 923.

2.7 HYDROSTATIC TEST ON WATERTIGHT JOINTS

2.7.1 Concrete, Clay, PVC and PE Pipe

A hydrostatic test shall be made on the watertight joint types as proposed. Only one sample joint of each type needs testing; however, if the sample joint fails because of faulty design or workmanship, an additional sample joint may be tested. During the test period, gaskets or other jointing material shall be protected from extreme temperatures which might adversely affect the performance of such materials. Performance requirements for joints in reinforced and nonreinforced concrete pipe shall conform to AASHTO M 198 or ASTM C 443. Test requirements for joints in clay pipe shall conform to ASTM C 425. Test requirements for joints in PVC and PE plastic pipe shall conform to ASTM D 3212.

2.7.2 Corrugated Steel and Aluminum Pipe

A hydrostatic test shall be made on the watertight joint system or coupling band type proposed. The moment strength required of the joint is expressed as 15 percent of the calculated moment capacity of the pipe on a transverse section remote from the joint by the AASHTO HB-16 (Division II, Section 26). The pipe shall be supported for the hydrostatic test with the joint located at the point which develops 15 percent of the moment capacity of the pipe based on the allowable span in feet for the pipe flowing full or 40,000 foot-pounds, whichever is less. Performance requirements shall be met at an internal hydrostatic pressure of 10 psi for a 10 minute period for both annular corrugated metal pipe and helical corrugated metal pipe with factory reformed ends.

PART 3 EXECUTION

3.1 EXCAVATION FOR PIPE CULVERTS, STORM DRAINS, AND DRAINAGE STRUCTURES

Excavation of trenches, and for appurtenances and backfilling for culverts and storm drains, shall be in accordance with the applicable portions of

[Section 02316 "Excavation, Trenching, and Backfilling for Utilities Systems"d] [Section 02300 "Earthwork"] and the requirements specified below.

3.1.1 Trenching

The width of trenches at any point below the top of the pipe shall be not greater than the outside diameter of the pipe plus [_____] inches to permit satisfactory jointing and thorough tamping of the bedding material under and around the pipe. Sheeting and bracing, where required, shall be placed within the trench width as specified. Contractor shall not overexcavate. Where trench widths are exceeded, redesign with a resultant increase in cost of stronger pipe or special installation procedures will be necessary. Cost of this redesign and increased cost of pipe or installation shall be borne by the Contractor without additional cost to the Government.

3.1.2 Removal of Rock

Rock in either ledge or boulder formation shall be replaced with suitable materials to provide a compacted earth cushion having a thickness between unremoved rock and the pipe of at least 8 inches or 1/2 inch for each foot of fill over the top of the pipe, whichever is greater, but not more than three-fourths the nominal diameter of the pipe. Where bell-and-spigot pipe is used, the cushion shall be maintained under the bell as well as under the straight portion of the pipe. Rock excavation shall be as specified and defined in Section 02316 "Excavation, Trenching, and Backfilling for Utilities Systems".

3.1.3 Removal of Unstable Material

Where wet or otherwise unstable soil incapable of properly supporting the pipe, as determined by the Contracting Officer, is unexpectedly encountered in the bottom of a trench, such material shall be removed to the depth required and replaced to the proper grade with select granular material, compacted as provided in paragraph BACKFILLING. When removal of unstable material is due to the fault or neglect of the Contractor in his performance of shoring and sheeting, water removal, or other specified requirements, such removal and replacement shall be performed at no additional cost to the government.

3.2 BEDDING

The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe.

3.2.1 Concrete Pipe Requirements

When no bedding class is specified or detailed on the drawings, concrete pipe shall be bedded in a soil foundation accurately shaped and rounded to conform to the lowest one-fourth of the outside portion of circular pipe or to the lower curved portion of pipe arch for the entire length of the pipe or pipe arch. When necessary, the bedding shall be tamped. Bell holes and depressions for joints shall be not more than the length, depth, and width required for properly making the particular type of joint.

3.2.2 Clay Pipe Requirements

Bedding for clay pipe shall be as specified by ASTM C 12.

3.2.3 Corrugated Metal Pipe

Bedding for corrugated metal pipe and pipe arch shall be in accordance with ASTM A 798/A 798M. It is not required to shape the bedding to the pipe geometry. However, for pipe arches, the Contractor shall either shape the bedding to the relatively flat bottom arc or fine grade the foundation to a shallow v-shape. Bedding for corrugated structural plate pipe shall meet requirements of ASTM A 807.

3.2.4 Ductile Iron Pipe

Bedding for ductile iron pipe shall be as shown on the drawings.

3.2.5 Plastic Pipe

Bedding for PVC and PE pipe shall meet the requirements of ASTM D 2321. Bedding, haunching, and initial backfill shall be either Class IB or II material.

3.3 PLACING PIPE

Each pipe shall be thoroughly examined before being laid; defective or damaged pipe shall not be used. Plastic pipe shall be protected from exposure to direct sunlight prior to laying, if necessary to maintain adequate pipe stiffness and meet installation deflection requirements. Pipelines shall be laid to the grades and alignment indicated. Proper facilities shall be provided for lowering sections of pipe into trenches. Lifting lugs in vertically elongated metal pipe shall be placed in the same vertical plane as the major axis of the pipe. Pipe shall not be laid in water, and pipe shall not be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary. Deflection of installed flexible pipe shall not exceed the following limits:

TYPE OF PIPE	MAXIMUM ALLOWABLE DEFLECTION (%)
Corrugated Steel and Aluminum Alloy	5
Concrete-Lined Corrugated Steel	3
Ductile Iron Culvert	3
Plastic	7.5

Not less than 30 days after the completion of backfilling, the Government may perform a deflection test on the entire length of installed flexible pipe using a mandrel or other suitable device. Installed flexible pipe showing deflections greater than those indicated above shall be retested by a run from the opposite direction. If the retest also fails, the suspect pipe shall be replaced at no cost to the Government.

3.3.1 Concrete, Clay, PVC, Ribbed PVC and Ductile Iron Pipe

Laying shall proceed upgrade with spigot ends of bell-and-spigot pipe and tongue ends of tongue-and-groove pipe pointing in the direction of the flow.

3.3.2 Elliptical and Elliptical Reinforced Concrete Pipe

The manufacturer's reference lines, designating the top of the pipe, shall be within 5 degrees of a vertical plane through the longitudinal axis of the pipe, during placement. Damage to or misalignment of the pipe shall be prevented in all backfilling operations.

3.3.3 Corrugated PE Pipe

Laying shall be with the separate sections joined firmly on a bed shaped to line and grade and shall follow manufacturer's recommendations.

3.3.4 Corrugated Metal Pipe and Pipe Arch

Laying shall be with the separate sections joined firmly together, with the outside laps of circumferential joints pointing upstream, and with longitudinal laps on the sides. Part paved pipe shall be installed so that the centerline of bituminous pavement in the pipe, indicated by suitable markings on the top at each end of the pipe sections, coincides with the specified alignment of pipe. Fully paved steel pipe or pipe arch shall have a painted or otherwise applied label inside the pipe or pipe arch indicating sheet thickness of pipe or pipe arch. Any unprotected metal in the joints shall be coated with bituminous material as specified in AASHTO M 190 or AASHTO M 243. Interior coating shall be protected against damage from insertion or removal of struts or tie wires. Lifting lugs shall be used to facilitate moving pipe without damage to exterior or interior coatings. During transportation and installation, pipe or pipe arch and coupling bands shall be handled with care to preclude damage to the coating, paving or lining. Damaged coatings, pavings and linings shall be repaired in accordance with the manufacturer's recommendations prior to placing backfill. Pipe on which coating, paving or lining has been damaged to such an extent that satisfactory field repairs cannot be made shall be removed and replaced. Vertical elongation, where indicated, shall be accomplished by factory elongation. Suitable markings or properly placed lifting lugs shall be provided to ensure placement of factory elongated pipe in a vertical plane.

3.3.5 Structural-Plate Steel

Structural plate shall be installed in accordance with ASTM A 807. Structural plate shall be assembled in accordance with instructions furnished by the manufacturer. Instructions shall show the position of each plate and the order of assembly. Bolts shall be tightened progressively and uniformly, starting at one end of the structure after all plates are in place. The operation shall be repeated to ensure that all bolts are tightened to meet the torque requirements of 200 foot-pounds plus or minus 50 foot-pounds. Any power wrenches used shall be checked by the use of hand torque wrenches or long-handled socket or structural wrenches for amount of torque produced. Power wrenches shall be checked and adjusted frequently as needed, according to type or condition, to ensure proper adjustment to supply the required torque.

3.3.6 Structural-Plate Aluminum

Structural plate shall be assembled in accordance with instructions furnished by the manufacturer. Instructions shall show the position of each plate and the order of assembly. Bolts shall be tightened progressively and uniformly, starting at one end of the structure after all plates are in place. The operation shall be repeated to ensure that all bolts are torqued to a minimum of 100 foot-pounds on aluminum alloy bolts

and a minimum of 150 foot-pounds on galvanized steel bolts. Any power wrenches used shall be checked by the use of hand torque wrenches or long-handled socket or structural wrenches for the amount of torque produced. Power wrenches shall be checked and adjusted as frequently as needed, according to type or condition, to ensure that they are in proper adjustment to supply the required torque.

3.3.7 Multiple Culverts

Where multiple lines of pipe are installed, adjacent sides of pipe shall be at least half the nominal pipe diameter or 3 feet apart, whichever is less.

3.3.8 Jacking Pipe Through Fills

Methods of operation and installation for jacking pipe through fills shall conform to requirements specified in Volume 1, Chapter 1, Part 4 of AREMA Manual.

3.4 JOINTING

3.4.1 Concrete and Clay Pipe

3.4.1.1 Cement-Mortar Bell-and-Spigot Joint

The first pipe shall be bedded to the established gradeline, with the bell end placed upstream. The interior surface of the bell shall be thoroughly cleaned with a wet brush and the lower portion of the bell filled with mortar as required to bring inner surfaces of abutting pipes flush and even. The spigot end of each subsequent pipe shall be cleaned with a wet brush and uniformly matched into a bell so that sections are closely fitted. After each section is laid, the remainder of the joint shall be filled with mortar, and a bead shall be formed around the outside of the joint with sufficient additional mortar. If mortar is not sufficiently stiff to prevent appreciable slump before setting, the outside of the joint shall be wrapped or bandaged with cheesecloth to hold mortar in place.

3.4.1.2 Cement-Mortar Oakum Joint for Bell-and-Spigot Pipe

A closely twisted gasket shall be made of jute or oakum of the diameter required to support the spigot end of the pipe at the proper grade and to make the joint concentric. Joint packing shall be in one piece of sufficient length to pass around the pipe and lap at top. This gasket shall be thoroughly saturated with neat cement grout. The bell of the pipe shall be thoroughly cleaned with a wet brush, and the gasket shall be laid in the bell for the lower third of the circumference and covered with mortar. The spigot of the pipe shall be thoroughly cleaned with a wet brush, inserted in the bell, and carefully driven home. A small amount of mortar shall be inserted in the annular space for the upper two-thirds of the circumference. The gasket shall be lapped at the top of the pipe and driven home in the annular space with a caulking tool. The remainder of the annular space shall be filled completely with mortar and beveled at an angle of approximately 45 degrees with the outside of the bell. If mortar is not sufficiently stiff to prevent appreciable slump before setting, the outside of the joint thus made shall be wrapped with cheesecloth. Placing of this type of joint shall be kept at least five joints behind laying operations.

3.4.1.3 Cement-Mortar Diaper Joint for Bell-and-Spigot Pipe

The pipe shall be centered so that the annular space is uniform. The annular space shall be caulked with jute or oakum. Before caulking, the inside of the bell and the outside of the spigot shall be cleaned.

a. Diaper Bands: Diaper bands shall consist of heavy cloth fabric to hold grout in place at joints and shall be cut in lengths that extend one-eighth of the circumference of pipe above the spring line on one side of the pipe and up to the spring line on the other side of the pipe. Longitudinal edges of fabric bands shall be rolled and stitched around two pieces of wire. Width of fabric bands shall be such that after fabric has been securely stitched around both edges on wires, the wires will be uniformly spaced not less than 8 inches apart. Wires shall be cut into lengths to pass around pipe with sufficient extra length for the ends to be twisted at top of pipe to hold the band securely in place; bands shall be accurately centered around lower portion of joint.

b. Grout: Grout shall be poured between band and pipe from the high side of band only, until grout rises to the top of band at the spring line of pipe, or as nearly so as possible, on the opposite side of pipe, to ensure a thorough sealing of joint around the portion of pipe covered by the band. Silt, slush, water, or polluted mortar grout forced up on the lower side shall be forced out by pouring, and removed.

c. Remainder of Joint: The remaining unfilled upper portion of the joint shall be filled with mortar and a bead formed around the outside of this upper portion of the joint with a sufficient amount of additional mortar. The diaper shall be left in place. Placing of this type of joint shall be kept at least five joints behind actual laying of pipe. No backfilling around joints shall be done until joints have been fully inspected and approved.

3.4.1.4 Cement-Mortar Tongue-and-Groove Joint

The first pipe shall be bedded carefully to the established gradeline with the groove upstream. A shallow excavation shall be made underneath the pipe at the joint and filled with mortar to provide a bed for the pipe. The grooved end of the first pipe shall be thoroughly cleaned with a wet brush, and a layer of soft mortar applied to the lower half of the groove. The tongue of the second pipe shall be cleaned with a wet brush; while in horizontal position, a layer of soft mortar shall be applied to the upper half of the tongue. The tongue end of the second pipe shall be inserted in the grooved end of the first pipe until mortar is squeezed out on interior and exterior surfaces. Sufficient mortar shall be used to fill the joint completely and to form a bead on the outside.

3.4.1.5 Cement-Mortar Diaper Joint for Tongue-and-Groove Pipe

The joint shall be of the type described for cement-mortar tongue-and-groove joint in this paragraph, except that the shallow excavation directly beneath the joint shall not be filled with mortar until after a gauze or cheesecloth band dipped in cement mortar has been wrapped around the outside of the joint. The cement-mortar bead at the joint shall be at least 1/2 inch, thick and the width of the diaper band shall be at least 8 inches. The diaper shall be left in place. Placing of this type of joint shall be kept at least five joints behind the actual laying of the pipe. Backfilling around the joints shall not be done until the joints have been fully inspected and approved.

3.4.1.6 Plastic Sealing Compound Joints for Tongue-and-Grooved Pipe

Sealing compounds shall follow the recommendation of the particular manufacturer in regard to special installation requirements. Surfaces to receive lubricants, primers, or adhesives shall be dry and clean. Sealing compounds shall be affixed to the pipe not more than 3 hours prior to installation of the pipe, and shall be protected from the sun, blowing dust, and other deleterious agents at all times. Sealing compounds shall be inspected before installation of the pipe, and any loose or improperly affixed sealing compound shall be removed and replaced. The pipe shall be aligned with the previously installed pipe, and the joint pulled together. If, while making the joint with mastic-type sealant, a slight protrusion of the material is not visible along the entire inner and outer circumference of the joint when the joint is pulled up, the pipe shall be removed and the joint remade. After the joint is made, all inner protrusions shall be cut off flush with the inner surface of the pipe. If nonmastic-type sealant material is used, the "Squeeze-Out" requirement above will be waived.

3.4.1.7 Flexible Watertight Joints

Gaskets and jointing materials shall be as recommended by the particular manufacturer in regard to use of lubricants, cements, adhesives, and other special installation requirements. Surfaces to receive lubricants, cements, or adhesives shall be clean and dry. Gaskets and jointing materials shall be affixed to the pipe not more than 24 hours prior to the installation of the pipe, and shall be protected from the sun, blowing dust, and other deleterious agents at all times. Gaskets and jointing materials shall be inspected before installing the pipe; any loose or improperly affixed gaskets and jointing materials shall be removed and replaced. The pipe shall be aligned with the previously installed pipe, and the joint pushed home. If, while the joint is being made the gasket becomes visibly dislocated the pipe shall be removed and the joint remade.

3.4.1.8 External Sealing Band Joint for Noncircular Pipe

Surfaces to receive sealing bands shall be dry and clean. Bands shall be installed in accordance with manufacturer's recommendations.

3.4.2 Corrugated Metal Pipe

3.4.2.1 Field Joints

Transverse field joints shall be designed so that the successive connection of pipe sections will form a continuous line free of appreciable irregularities in the flow line. In addition, the joints shall meet the general performance requirements described in ASTM A 798/A 798M. Suitable transverse field joints which satisfy the requirements for one or more of the joint performance categories can be obtained with the following types of connecting bands furnished with suitable band-end fastening devices: corrugated bands, bands with projections, flat bands, and bands of special design that engage factory reformed ends of corrugated pipe. The space between the pipe and connecting bands shall be kept free from dirt and grit so that corrugations fit snugly. The connecting band, while being tightened, shall be tapped with a soft-head mallet of wood, rubber or plastic, to take up slack and ensure a tight joint. The annular space between abutting sections of part paved, and fully paved pipe and pipe arch, in sizes 30 inches or larger, shall be filled with a bituminous material after jointing. Field joints for each type of corrugated metal

pipe shall maintain pipe alignment during construction and prevent infiltration of fill material during the life of the installations. The type, size, and sheet thickness of the band and the size of angles or lugs and bolts shall be as indicated or where not indicated, shall be as specified in the applicable standards or specifications for the pipe.

3.4.2.2 Flexible Watertight, Gasketed Joints

Installation shall be as recommended by the gasket manufacturer for use of lubricants and cements and other special installation requirements. The gasket shall be placed over one end of a section of pipe for half the width of the gasket. The other half shall be doubled over the end of the same pipe. When the adjoining section of pipe is in place, the doubled-over half of the gasket shall then be rolled over the adjoining section. Any unevenness in overlap shall be corrected so that the gasket covers the end of pipe sections equally. Connecting bands shall be centered over adjoining sections of pipe, and rods or bolts placed in position and nuts tightened. Band Tightening: The band shall be tightened evenly, even tension being kept on the rods or bolts, and the gasket; the gasket shall seat properly in the corrugations. Watertight joints shall remain uncovered for a period of time designated, and before being covered, tightness of the nuts shall be measured with a torque wrench. If the nut has tended to loosen its grip on the bolts or rods, the nut shall be retightened with a torque wrench and remain uncovered until a tight, permanent joint is assured.

3.5 DRAINAGE STRUCTURES

3.5.1 Manholes and Inlets

Construction shall be of reinforced concrete, plain concrete, brick, precast reinforced concrete, precast concrete segmental blocks, prefabricated corrugated metal, or bituminous coated corrugated metal; complete with frames and covers or gratings; and with fixed galvanized steel ladders where indicated. Pipe studs and junction chambers of prefabricated corrugated metal manholes shall be fully bituminous-coated and paved when the connecting branch lines are so treated. Pipe connections to concrete manholes and inlets shall be made with flexible, watertight connectors.

3.5.2 Walls and Headwalls

Construction shall be as indicated.

3.6 STEEL LADDER INSTALLATION

Ladder shall be adequately anchored to the wall by means of steel inserts spaced not more than 6 feet vertically, and shall be installed to provide at least 6 inches of space between the wall and the rungs. The wall along the line of the ladder shall be vertical for its entire length.

3.7 BACKFILLING

3.7.1 Backfilling Pipe in Trenches

After the pipe has been properly bedded, selected material from excavation or borrow, at a moisture content that will facilitate compaction, shall be placed along both sides of pipe in layers not exceeding 6 inches in compacted depth. The backfill shall be brought up evenly on both sides of

pipe for the full length of pipe. The fill shall be thoroughly compacted under the haunches of the pipe. Each layer shall be thoroughly compacted with mechanical tampers or rammers. This method of filling and compacting shall continue until the fill has reached an elevation of at least 12 inches above the top of the pipe. The remainder of the trench shall be backfilled and compacted by spreading and rolling or compacted by mechanical rammers or tampers in layers not exceeding [_____] inches. Tests for density shall be made as necessary to ensure conformance to the compaction requirements specified below. Where it is necessary, in the opinion of the Contracting Officer, that sheeting or portions of bracing used be left in place, the contract will be adjusted accordingly. Untreated sheeting shall not be left in place beneath structures or pavements.

3.7.2 Backfilling Pipe in Fill Sections

For pipe placed in fill sections, backfill material and the placement and compaction procedures shall be as specified below. The fill material shall be uniformly spread in layers longitudinally on both sides of the pipe, not exceeding 6 inches in compacted depth, and shall be compacted by rolling parallel with pipe or by mechanical tamping or ramming. Prior to commencing normal filling operations, the crown width of the fill at a height of 12 inches above the top of the pipe shall extend a distance of not less than twice the outside pipe diameter on each side of the pipe or 12 feet, whichever is less. After the backfill has reached at least 12 inches above the top of the pipe, the remainder of the fill shall be placed and thoroughly compacted in layers not exceeding [_____] inches.

3.7.3 Movement of Construction Machinery

When compacting by rolling or operating heavy equipment parallel with the pipe, displacement of or injury to the pipe shall be avoided. Movement of construction machinery over a culvert or storm drain at any stage of construction shall be at the Contractor's risk. Any damaged pipe shall be repaired or replaced.

3.7.4 Compaction

3.7.4.1 General Requirements

Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands. Cohesive materials include clayey and silty gravels, gravel-silt mixtures, clayey and silty sands, sand-clay mixtures, clays, silts, and very fine sands. When results of compaction tests for moisture-density relations are recorded on graphs, cohesionless soils will show straight lines or reverse-shaped moisture-density curves, and cohesive soils will show normal moisture-density curves.

3.7.4.2 Minimum Density

Backfill over and around the pipe and backfill around and adjacent to drainage structures shall be compacted at the approved moisture content to the following applicable minimum density, which will be determined as specified below.

a. Under airfield and heliport pavements, paved roads, streets, parking areas, and similar-use pavements including adjacent shoulder areas, the density shall be not less than 90 percent of maximum density for cohesive material and 95 percent of maximum

density for cohesionless material, up to the elevation where requirements for pavement subgrade materials and compaction shall control.

b. Under unpaved or turfed traffic areas, density shall not be less than 90 percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material.

c. Under nontraffic areas, density shall be not less than that of the surrounding material.

3.7.5 Determination of Density

Testing shall be the responsibility of the Contractor and performed at no additional cost to the Government. Testing shall be performed by an approved commercial testing laboratory or by the Contractor subject to approval. Tests shall be performed in sufficient number to ensure that specified density is being obtained. Laboratory tests for moisture-density relations shall be made in accordance with ASTM D 1557 except that mechanical tampers may be used provided the results are correlated with those obtained with the specified hand tamper. Field density tests shall be determined in accordance with ASTM D 2167 or ASTM D 2922. When ASTM D 2922 is used, the calibration curves shall be checked and adjusted, if necessary, using the sand cone method as described in paragraph Calibration of the referenced publications. ASTM D 2922 results in a wet unit weight of soil and when using this method ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in ASTM D 3017 or ASTM D 2922. Test results shall be furnished the Contracting Officer. 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.

3.8 PIPELINE TESTING

Lines shall be tested for leakage by low pressure air or water testing or exfiltration tests, as appropriate. Low pressure air testing for vitrified clay pipes shall conform to ASTM C 828. Low pressure air testing for concrete pipes shall conform to ASTM C 924. Low pressure air testing for plastic pipe shall conform to ASTM F 1417. Low pressure air testing procedures for other pipe materials shall use the pressures and testing times prescribed in ASTM C 828 or ASTM C 924, after consultation with the pipe manufacturer. Testing of individual joints for leakage by low pressure air or water shall conform to ASTM C 1103. Prior to exfiltration tests, the trench shall be backfilled up to at least the lower half of the pipe. If required, sufficient additional backfill shall be placed to prevent pipe movement during testing, leaving the joints uncovered to permit inspection. Visible leaks encountered shall be corrected regardless of leakage test results. When the water table is 2 feet or more above the top of the pipe at the upper end of the pipeline section to be tested, infiltration shall be measured using a suitable weir or other device acceptable to the Contracting Officer. An exfiltration test shall be made by filling the line to be tested with water so that a head of at least 2 feet is provided above both the water table and the top of the pipe at the upper end of the pipeline to be tested. The filled line shall be allowed to stand until the pipe has reached its maximum absorption, but not less than 4 hours. After absorption, the head shall be reestablished. The amount of water required to maintain this water level during a 2-hour test period shall be measured. Leakage as measured by the exfiltration test

shall not exceed [250 gallons per inch in diameter per mile of pipeline per day] [0.2 gallons per inch in diameter per 100 feet of pipeline per hour]. When leakage exceeds the maximum amount specified, satisfactory correction shall be made and retesting accomplished. Testing, correcting, and retesting shall be made at no additional cost to the Government.

-- End of Section --

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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 116	(2000) Metallic-Coated, Steel Woven Wire Fence Fabric
ASTM A 121	(1999) Zinc-Coated (Galvanized) Steel Barbed Wire
ASTM A 153/A 153M	(2001) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 176	(1999) Stainless and Heat-Resisting Chromium Steel Plate, Sheet, and Strip
ASTM A 392	(1996) Zinc-Coated Steel Chain-Link Fence Fabric
ASTM A 478	(1997) Chromium-Nickel Stainless Steel Weaving and Knitting Wire
ASTM A 491	(1996) Aluminum-Coated Steel Chain-Link Fence Fabric
ASTM A 585	(1997) Aluminum-Coated Steel Barbed Wire
ASTM A 666	(2000) Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar
ASTM A 702	(1989; R 1994el) Steel Fence Posts and Assemblies, Hot Wrought
ASTM A 780	(2000) Repair of Damaged and Uncoated Areas of Hot-Dipped Galvanized Coatings
ASTM A 824	(1995) Metallic-Coated Steel Marcelled Tension Wire for Use With Chain Link Fence
ASTM C 94/C 94M	(2000e2) Ready-Mixed Concrete
ASTM D 4541	(1995el) Pull-Off Strength of Coatings Using Portable Adhesion Testers

ASTM F 1043	(2000) Strength and Protective Coatings on Metal Industrial Chain-Link Fence Framework
ASTM F 1083	(1997) Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
ASTM F 1184	(1994) Industrial and Commercial Horizontal Slide Gates
ASTM F 626	(1996a) Fence Fittings
ASTM F 668	(1999a) Poly(Vinyl Chloride) (PVC)-Coated Steel Chain-Link Fence Fabric
ASTM F 883	(1997) Padlocks
ASTM F 900	(1994) Industrial and Commercial Swing Gates
ASTM G 23	(1996) Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials
ASTM G 26	(1996) Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials
ASTM G 53	(1996) Operating Light- and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)

AWPA C1	(2000) All Timber Products - Preservative Treatment by Pressure Processes
AWPA C4	(1999) Poles - Preservative Treatment by Pressure Processes

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-07 Certificates

Chain Link Fence; [_____], [_____]

Statement, signed by an official authorized to certify on behalf of the manufacturer, attesting that the chain link fence and component materials meet the specified requirements.

SD-10 Operation and Maintenance Data

Electro-Mechanical Locks; [_____], [_____]

Gate Operator; [_____], [_____]

[Six] [_____] copies of operating and maintenance instructions, a minimum of 2 weeks prior to field training. Operating instructions shall outline the step-by-step procedures required for system startup, operation, and shutdown. The instructions shall include the manufacturer's name, model number, service manual, parts list, and brief description of all equipment and their basic operating features. Maintenance instructions shall include routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guide. The instructions shall include the general gate layout, equipment layout and simplified wiring and control diagrams of the system as installed.

[1.3 APPROVAL OF POLYVINYL CHLORIDE-COATED FENCE MATERIALS

Polyvinyl chloride-coated fence materials shall be throughly inspected for cracking, peeling, and conformance with the specifications by the Contracting Officer's Representative prior to installation. Any fence materials rejected by the Contracting Officer's Representative shall be replaced by the contractor with approved materials at no additional cost to the Government.]

PART 2 PRODUCTS

2.1 FENCE FABRIC

Fence fabric shall conform to the following:

2.1.1 Chain Link Fence Fabric

[ASTM A 392, [Class 1] [Class 2], zinc-coated steel wire with minimum coating weight of [1.2] [2.0] ounces of zinc per square foot of coated surface, or ASTM A 491, Type I, aluminum-coated steel wire.] [Class 2b polyvinyl chloride-coated steel fabric with 0.3 ounces of zinc coating per square foot in accordance with ASTM F 668.] Fabric shall be fabricated of 9 gauge wire woven in 2 inch mesh. [Polyvinyl chloride coating for fabric and all other fence components shall be manufacturer's standard [_____] in color.] Fabric height shall be [[6] [7] feet] [[_____] feet] [as shown]. Fabric shall be twisted and barbed on the top selvage and knuckled on the bottom selvage.

2.1.2 Woven Wire

Woven wire shall conform to ASTM A 116 [No. 9 farm] [No. 12-1/2 close mesh] [No. 14-1/2 wolf-proof] [No. 13 poultry and garden] [No. 14-1/2 chick] fence; grade, size as indicated.

2.2 GATES

ASTM F 900 and/or ASTM F 1184. Gate shall be the type and swing shown. Gate frames shall conform to strength and coating requirements of ASTM F 1083 for Group IA, steel pipe, with external coating Type A, nominal pipe size (NPS) 1-1/2. Gate frames shall conform to strength and coating requirements of ASTM F 1043, for Group IC, steel pipe with external coating Type A or Type B, nominal pipe size (NPS) 1-1/2. [Gate frames shall be polyvinyl chloride-coated steel pipe (Group IA)(Group IC) with external coating Type A, a nominal pipe size ()NPS) 1-1/2, conforming to ASTM F 1043.] Gate fabric shall be as specified for chain link fabric. Gate leaves more

than 8 feet wide shall have either intermediate members and diagonal truss rods or shall have tubular members as necessary to provide rigid construction, free from sag or twist. Gate leaves less than 8 feet wide shall have truss rods or intermediate braces. Intermediate braces shall be provided on all gate frames with an electro-mechanical lock. Gate fabric shall be attached to the gate frame by method standard with the manufacturer except that welding will not be permitted. Latches, hinges, stops, keepers, rollers, and other hardware items shall be furnished as required for the operation of the gate. Latches shall be arranged for padlocking so that the padlock will be accessible from both sides of the gate. Stops shall be provided for holding the gates in the open position. For high security applications, each end member of gate frames shall be extended sufficiently above the top member to carry three strands of barbed wire in horizontal alignment with barbed wire strands on the fence.

2.3 POSTS

2.3.1 Metal Posts for Chain Link Fence

ASTM F 1083, zinc-coated. Group IA, with external coating Type A steel pipe. Group IC steel pipe, zinc-coated with external coating Type A or Type B and Group II , roll-formed steel sections, shall meet the strength and coating requirements of ASTM F 1043. Group III, ASTM F 1043 steel H-section may be used for line posts in lieu of line post shapes specified for the other classes. [Post shall be either Group IA steel pipe, Group IC, Group II, roll-formed steel sections, or Group III steel H-sections and shall be zinc coated (Type A) and polyvinyl chloride coated conforming to the requirements of ASTM F 1043.] Sizes shall be as shown on the drawings. Line posts and terminal (corner, gate, and pull) posts selected shall be of the same designation throughout the fence. Gate post shall be for the gate type specified subject to the limitation specified in ASTM F 900 and/or ASTM F 1184.

2.3.2 Metal Posts for Farm Style Fence

Metal posts shall conform to ASTM A 702 zinc-coated, [T-section] [U-Section]; length as indicated. Accessories shall conform to ASTM A 702.

2.3.3 Composite Polyester Resin Reinforced Line Posts

Polyester resin reinforced line posts shall be produced from unsaturated polyester resin reinforced with E-glass. Posts shall be filled with an appropriate filler material to form a rigid structural support member. The post shall meet the strength requirements of ASTM F 1043 for heavy industrial fencing. Posts shall be protected from UV and moisture degradation by a protective veil impregnated with resin (8 to 12 mil minimum) and an acrylic based (2 mil minimum) coating system. Posts shall exhibit corrosion and ultraviolet resistance as demonstrated when exposed to accelerated environmental test chamber for not less than 3,600 hours. The post shall show no structural failure (i.e., less than 10% loss of strength) as a result of exposure to moisture and lamps required in ASTM G 23, ASTM G 26 and ASTM G 53. Post coating system strength shall be tested in accordance with ASTM D 4541 for 90% adhesion strength. Posts shall be [green] [black] [brown] in color. Provide outside diameter as specified in ASTM F 1043 for round steel pipe.

2.3.4 Wood Posts

Wood posts shall be cut from sound and solid trees free from short or

reverse bends in more than one plane. Tops shall be convex rounded or inclined. Posts shall be free of ring shake, season cracks more than 1/4 inch wide, splits in the end, and unsound knots. Size and shape of posts shall be as indicated. Posts shall be treated in accordance with AWPA C1 or AWPA C4 as applicable.

2.4 BRACES AND RAILS

ASTM F 1083, zinc-coated, Group IA, steel pipe, size NPS 1-1/4. Group IC steel pipe, zinc-coated, shall meet the strength and coating requirements of ASTM F 1043. [Braces and rails shall be [Group IA] [Group IC], steel pipe, size NPS 1-1/4 or Group II,formed steel sections, size 1-21/32 inch and shall be zinc coated (Type A) and polyvinyl chloride-coated conforming to the requirements of ASTM F 1043.] Group II, formed steel sections, size 1-21/32 inch, conforming to ASTM F 1043, may be used as braces and rails if Group II line posts are furnished.

2.5 WIRE

2.5.1 Tension Wire

Tension wire shall be Type I or Type II, Class 2 coating, in accordance with ASTM A 824.

2.5.2 Barbed Wire for Farm Style Fence

Barbed wire shall conform to ASTM A 121 [uncoated] [zinc-coated] [copper-coated], class 1, 13 gauge wire with 13-1/2 gauge 4-point barbs spaced no more than 6 inches apart.

2.6 ACCESSORIES

ASTM F 626. Ferrous accessories shall be zinc or aluminum coated. [Ferrous accessories shall also be polyvinyl chloride-coated, minimum thickness of 0.006 inch, maximum thickness of 0.015 inch. Color coating of fittings shall match the color coating of the fabric.] Truss rods shall be furnished for each terminal post. Truss rods shall be provided with turnbuckles or other equivalent provisions for adjustment. Barbed wire shall be 2 strand, 12-1/2 gauge wire, zinc-coated, Class 3 in accordance with ASTM A 121 or aluminum coated Type I in accordance with ASTM A 585. Barbed wire shall be four-point barbed type steel wire. Barbed wire support arms shall be the [single] [V] arm type and of the design required for the post furnished. Tie wire for attaching fabric to rails, braces, and posts shall be 9 gauge steel wire and match the coating of the fence fabric. [Tie wires for attaching fabric to tension wire on high security fences shall be 16 gage stainless steel. The tie wires shall be a double loop and 6.5 inches in length.] Miscellaneous hardware coatings shall conform to ASTM A 153/A 153M unless modified. [Threaded hardware shall be painted to match polyvinyl chloride coatings.]

2.7 BARBED TAPE

Reinforced barbed tape, [double coil] [single coil], for fence toppings shall be fabricated from 430 series stainless steel with a hardness range of Rockwell (30N) 37-45 conforming to the requirements of ASTM A 176. The stainless steel strip shall be 0.025 inch thick by 1 inch wide before fabrication. Each barb shall be a minimum of 1.2 inch in length, in groups of 4, spaced on 4 inch centers. The stainless steel core wire shall have a 0.098 inch diameter with a minimum tensile strength of 140 psi and shall be

in accordance with ASTM A 478. [Reinforced barbed tape, single coil, for ground application shall meet the above requirements.] [Non-reinforced barbed tape, single coil, for ground applications shall be fabricated from 301 series stainless steel, with a hardness range of Rockwell (30N) 50-55, in accordance with ASTM A 666. The stainless steel strip shall be 0.025 inch thick by 1.21 inches wide before fabrication. Each barb shall be a minimum of 1.2 inch in length, in groups of 4, spaced on 4 inch centers.] Sixteen gauge stainless steel twistable wire ties shall be used for attaching the barbed tape to the barbed wire [and to the fence for ground application].

2.8 CONCRETE

ASTM C 94/C 94M, using 3/4 inch maximum size aggregate, and having minimum compressive strength of 3000 psi at 28 days. Grout shall consist of one part portland cement to three parts clean, well-graded sand and the minimum amount of water to produce a workable mix.

2.9 PADLOCKS

Padlocks shall conform to ASTM F 883, Type [PO1] [_____], Option[s] [A, B, and G] [_____] [and] [_____], Grade [6] [_____]. [EPB], Size 1-3/4 inch. [All padlocks shall be keyed alike]. [All padlocks shall be keyed into master key system as specified in Section 08710 DOOR HARDWARE].

2.10 GATE OPERATOR

Electric gate operators for sliding gates shall be as follows: Electrical gate operators shall have a right angle gearhead instantly reversing motor with magnetic drum-type brake, friction disc clutch, reversing starter with thermal overload protection, and a chain-driven geared rotary-type automatic limit switch. Gears shall consist of a hardened steel machine cut worm and mating bronze gear. All gears and bearings shall operate in a bath of oil. Gate operators with V-belt pulleys will not be allowed. Gate operators shall be equipped with an emergency release to allow the gate to be operated manually. The emergency release mechanism shall be capable of being locked in the engaged or disengaged position. Positive stops shall be provided on the gate tracks as a backup to the limit switches.

2.11 ELECTRO-MECHANICAL LOCKS

Electro-mechanical locking devices for sliding gates and personnel gates shall be solenoid actuated such that the deadbolt retracts when the solenoid is energized and remains electrically retracted until the gate is closed. The solenoid shall be the continuous duty type, rated for 120V ac, 60Hz operation. The locking device shall be unlockable by key and shall be keyed on both sides. Status of the electro-mechanical lock shall be monitored by two limit switches (integral to the locking device) wired in series. One switch shall monitor the deadlock lever and the other switch shall monitor the locking tongue.

PART 3 EXECUTION

3.1 INSTALLATION

Fence shall be installed to the lines and grades indicated. The area on either side of the fence line shall be cleared to the extent indicated. Line posts shall be spaced equidistant at intervals not exceeding 10 feet. Terminal (corner, gate, and pull) posts shall be set at abrupt changes in

vertical and horizontal alignment. Fabric shall be continuous between terminal posts; however, runs between terminal posts shall not exceed 500 feet. Any damage to galvanized surfaces, including welding, shall be repaired with paint containing zinc dust in accordance with ASTM A 780.

3.2 EXCAVATION

Post holes shall be cleared of loose material. Waste material shall be spread where directed. The ground surface irregularities along the fence line shall be eliminated to the extent necessary to maintain a [1] [2] inch clearance between the bottom of the fabric and finish grade.

3.3 POST INSTALLATION

3.3.1 Posts for Chain Link Fence

Posts shall be set plumb and in alignment. Except where solid rock is encountered, posts shall be set in concrete to the depth indicated on the drawings. Where solid rock is encountered with no overburden, posts shall be set to a minimum depth of 18 inches in rock. Where solid rock is covered with an overburden of soil or loose rock, posts shall be set to the minimum depth indicated on the drawing unless a penetration of 18 inches in solid rock is achieved before reaching the indicated depth, in which case depth of penetration shall terminate. All portions of posts set in rock shall be grouted. Portions of posts not set in rock shall be set in concrete from the rock to ground level. Posts set in concrete shall be set in holes not less than the diameter shown on the drawings. Diameters of holes in solid rock shall be at least 1 inch greater than the largest cross section of the post. Concrete and grout shall be thoroughly consolidated around each post, shall be free of voids and finished to form a dome. Concrete and grout shall be allowed to cure for 72 hours prior to attachment of any item to the posts. Group II line posts may be mechanically driven, for temporary fence construction only, if rock is not encountered. Driven posts shall be set to a minimum depth of 3 feet and shall be protected with drive caps when being set. For high security fences, fence post rigidity shall be tested by applying a 50 pound force on the post, perpendicular to the fabric, at 5 feet above ground; post movement measured at the point where the force is applied shall be less than or equal to 3/4 inch from the relaxed position; every tenth post shall be tested for rigidity; when a post fails this test, further tests on the next four posts on either side of the failed post shall be made; all failed posts shall be removed, replaced, and retested at the Contractor's expense.

3.3.2 Posts for Farm Style Fence

For wood posts, the Contractor shall excavate to depth indicated and brace post until backfill is completed. Backfill shall be placed in layers of 9 inches or less, moistened to optimum condition, and compacted with hand tampers or other approved method. Posts shall be set plumb and in proper alignment. Metal posts shall be driven or set in concrete as indicated.

3.4 RAILS

3.4.1 Top Rail

Top rail shall be supported at each post to form a continuous brace between terminal posts. Where required, sections of top rail shall be joined using sleeves or couplings that will allow expansion or contraction of the rail. Top rail, if required for high security fence, shall be installed as

indicated on the drawings.

3.4.2 Bottom Rail

The bottom rail shall be bolted to double rail ends and double rail ends shall be securely fastened to the posts. Bolts shall be peened to prevent easy removal. Bottom rail shall be installed before chain link fabric.

3.5 BRACES AND TRUSS RODS

Braces and truss rods shall be installed as indicated and in conformance with the standard practice for the fence furnished. Horizontal (compression) braces and diagonal truss (tension) rods shall be installed on fences over 6 feet in height. A center brace or 2 diagonal truss rods shall be installed on 12 foot fences. Braces and truss rods shall extend from terminal posts to line posts. Diagonal braces shall form an angle of approximately 40 to 50 degrees with the horizontal. No bracing is required on fences 6 feet high or less if a top rail is installed.

3.6 TENSION WIRES

Tension wires shall be installed along the [top and] [bottom] of the fence line and attached to the terminal posts of each stretch of the fence. Top tension wires shall be installed within the top [1 foot] [4 inches] of the installed fabric. Bottom tension wire shall be installed within the bottom 6 inches of the installed fabric. Tension wire shall be pulled taut and shall be free of sag.

3.7 CHAIN LINK FABRIC

Chain link fabric shall be installed on the side of the post indicated. Fabric shall be attached to terminal posts with stretcher bars and tension bands. Bands shall be spaced at approximately 15 inch intervals. The fabric shall be installed and pulled taut to provide a smooth and uniform appearance free from sag, without permanently distorting the fabric diamond or reducing the fabric height. Fabric shall be fastened to line posts at approximately 15 inch intervals and fastened to all rails and tension wires at approximately [24] [12] inch intervals. Fabric shall be cut by untwisting and removing pickets. Splicing shall be accomplished by weaving a single picket into the ends of the rolls to be joined. The bottom of the installed fabric shall be [2] [1] plus or minus 1/2 inch above the ground. For high security fence, after the fabric installation is complete, the fabric shall be exercised by applying a 50 pound push-pull force at the center of the fabric between posts; the use of a 30 pound pull at the center of the panel shall cause fabric deflection of not more than 2-1/2 inches when pulling fabric from the post side of the fence; every second fence panel shall meet this requirement; all failed panels shall be resecured and retested at the Contractor's expense.

3.8 BARBED WIRE SUPPORTING ARMS AND BARBED WIRE

3.8.1 General Requirements

Barbed wire supporting arms and barbed wire shall be installed as indicated and as recommended by the manufacturer. Supporting arms shall be anchored [to the posts in a manner to prevent easy removal with hand tools] [with 3/8 inch diameter plain pin rivets or, at the Contractor's option, with studs driven by low-velocity explosive-actuated tools for steel, wrought iron, ductile iron, or malleable iron. Studs driven by an

explosive-actuated tool shall not be used with gray iron or other material that can be fractured. A minimum of two studs per support arm shall be used.] Barbed wire shall be pulled taut and attached to the arms with clips or other means that will prevent easy removal.

3.8.2 Barbed Wire for Farm Style Fence

Wire shall be installed on the side of the post indicated. Wire shall be pulled taut to provide a smooth uniform appearance, free from sag. Wire shall be fastened to line posts at approximately 15 inch intervals unless indicated otherwise.

3.9 GATE INSTALLATION

Gates shall be installed at the locations shown. Hinged gates shall be mounted to swing as indicated. Latches, stops, and keepers shall be installed as required. [Slide] [Lift] gates shall be installed as recommended by the manufacturer. Padlocks shall be attached to gates or gate posts with chains. Hinge pins, and hardware shall be welded or otherwise secured to prevent removal. For farm style fencing, standard metal gate assemblies with frame and fittings necessary for complete installation or wood gates shall be furnished as shown.

3.10 BARBED TAPE INSTALLATION

Stainless steel reinforced barbed tape shall be installed as detailed on the drawings. Barbed tape shall be stretched out to its manufacturer's recommended length, set on top of the barbed wire and "V" shaped support arms, and then secured to the barbed wire. The barbed tape shall be secured to the barbed wire at the two points and at every spiral turn of both coils as shown on the drawings. Stainless steel [reinforced] [non-reinforced] barbed tape for ground applications shall be installed [per manufacturer's recommendations] [as shown on the drawings].

3.11 GROUNDING

[Fences crossed by overhead powerlines in excess of 600 volts shall be grounded as specified in Section 13100A LIGHTNING PROTECTION SYSTEM. Electrical equipment attached to the fence shall be grounded as specified in [Section 16370A ELECTRICAL DISTRIBUTION SYSTEM, AERIAL] [Section 16375A ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND].] [Fences shall be grounded on each side of all gates, at each corner, at the closest approach to each building located within 50 feet of the fence, and where the fence alignment changes more than 15 degrees. Grounding locations shall not exceed 650 feet. Each gate panel shall be bonded with a flexible bond strap to its gate post. Fences crossed by powerlines of 600 volts or more shall be grounded at or near the point of crossing and at distances not exceeding 150 feet on each side of crossing. Ground conductor shall consist of No. 8 AWG solid copper wire. Grounding electrodes shall be 3/4 inch by 10 foot long copper-clad steel rod. Electrodes shall be driven into the earth so that the top of the electrode is at least 6 inches below the grade. Where driving is impracticable, electrodes shall be buried a minimum of 12 inches deep and radially from the fence. The top of the electrode shall be not less than 2 feet or more than 8 feet from the fence. Ground conductor shall be clamped to the fence and electrodes with bronze grounding clamps to create electrical continuity between fence posts, fence fabric, and ground rods. After installation the total resistance of fence to ground shall not be greater than 25 ohms.]

-- End of Section --

ATTACHMENT NO. 4

ELLSWORTH PHASING AND FUTURE HOUSING PLAN (BY FUNDING YEAR)

ACC HOUSING INDUSTRY DAY

Ellsworth AFB (FY 04 - FY 09)

ATTACHMENT NO. 5

DRAWINGS (RFP)

RFP Drawings for Replace Family Housing are listed below and are included on the CD-ROM with the solicitation requirements in (*.cals format). See Sections 00800, 01040 and 01332 for usage and drawing requirements.

D1.01 COVER
D2.01 INDEX
D3.02 LEGEND
D4.03 ELECTRICAL LEGEND
D5.04 ABBREVIATIONS
G1.00 INDEX OF DRAWINGS
G1.01 LOCATION PLAN AND VICINITY MAP
C1.00 OVERALL TOPOGRAPHIC SURVEY
C1.01 TOPOGRAPHIC SURVEY - AREA 1
C1.02 TOPOGRAPHIC SURVEY - AREA 2
C1.03 TOPOGRAPHIC SURVEY - AREA 3
C1.04 TOPOGRAPHIC SURVEY - AREA 4
C1.05 TOPOGRAPHIC SURVEY - AREA 5
C1.06 TOPOGRAPHIC SURVEY - AREA 6
C2.01 SECURITY FENCE RELOCATION SITE PLAN
C2.02 SECURITY FENCE DETAILS 1
C2.03 SECURITY FENCE DETAILS II
C3.01 DEMOLITION PLAN I
C3.02 DEMOLITION PLAN II
C3.03 DEMOLITION PLAN III
C4.01 TYPE A2 UNIT - DEMOLITION INFORMATION
C4.02 TYPE A3 UNIT - DEMOLITION INFORMATION
C5.01 SITE PLAN I
C5.02 SITE PLAN II

C5.03 SITE PLAN III
C6.01 GRADING AND DRAINAGE PLAN I
C6.02 GRADING AND DRAINAGE PLAN II
C6.03 GRADING AND DRAINAGE PLAN III
C7.01 WATER AND SANITARY SEWER PLAN I
C7.02 WATER AND SANITARY SEWER PLAN II
C7.03 WATER AND SANITARY SEWER PLAN III
C8.01 GAS DISTRIBUTION PLAN I
C8.02 GAS DISTRIBUTION PLAN II
C8.03 GAS DISTRIBUTION PLAN III
C9.01 ELECTRICAL DEMOLITION PLAN I
C9.02 ELECTRICAL DEMOLITION PLAN II
C9.03 ELECTRICAL DEMOLITION PLAN III
C9.04 ELECTRICAL SITE PLAN I
C9.05 ELECTRICAL SITE PLAN II
C9.06 ELECTRICAL SITE PLAN III