

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES	
			J	1	4
2. AMENDMENT/MODIFICATION NO. 0002	3. EFFECTIVE DATE 14-Feb-2003	4. REQUISITION/PURCHASE REQ. NO. W68MD9-2346-3730		5. PROJECT NO.(If applicable)	
6. ISSUED BY USA ENGINEER DISTRICT, SEATTLE ATTN: CENWS-CT P.O. BOX 3755 SEATTLE WA 98124-3755	CODE DACA67	7. ADMINISTERED BY (If other than item 6) See Item 6		CODE	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)			X	9A. AMENDMENT OF SOLICITATION NO. DACA67-03-R-0207	
			X	9B. DATED (SEE ITEM 11) 27-Jan-2003	
				10A. MOD. OF CONTRACT/ORDER NO.	
				10B. DATED (SEE ITEM 13)	
CODE	FACILITY CODE				
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS					
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input checked="" type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.					
12. ACCOUNTING AND APPROPRIATION DATA (If required)					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.					
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).					
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:					
D. OTHER (Specify type of modification and authority)					
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Correct drawings, specifications, and insert transcript of site visit.					
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.					
15A. NAME AND TITLE OF SIGNER (Type or print)			16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)		
			TEL: _____ EMAIL: _____		
15B. CONTRACTOR/OFFEROR _____ (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY _____ (Signature of Contracting Officer)		16C. DATE SIGNED 14-Feb-2003	

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

The following items are applicable to this modification:CONT. SHEET

A. This amendment is issued to provide the following revisions to this solicitation:

1. Revisions to the Bid Schedule: addition of line items 19, 20, and 21.
 2. Revision to Section 00110 - In paragraph **1.2. Project Description**, line 5 - the word "aluminum" is changed to "steel".
 3. Specification Clause Section 00800 (Special Clauses) is revised to change "460" to "440" in Paragraph SC-1.
 4. The Following Technical Specifications are revised: 01270 Payment, 01501 Construction Facilities and Temporary Controls, 02300 Earthwork, 02316 Excavation, Trenching and Backfilling for Utilities Systems, 02741 Hot-Mix Asphalt (HMA) for Roads, 07210 Building Insulation, 07460 Siding, 07620 Sheet Metal Flashing and Trim, 12356 Kitchen and Bath Casework, 12491 Horizontal Louver Blinds and Drapery Rods, 15400 Plumbing, 16050 Basic Electrical Materials and Methods, 16121 Medium-Voltage Cable, 16123 (600 Volts and Less) Wire and Cable, 16130 Raceways and Boxes, 16140 Wiring Devices General, 16150 Wiring Connections, 16210 Electrical Utility Services General, 16271 Pad-Mounted Transformers, 16442 Load Centers, and 16722 Residential Smoke and Carbon Monoxide/Gas Detectors.
 5. Deletion of Section 07311 Asphalt Shingles and replacement with new Section 07310 Asphalt Shingles.
 6. Revision 'A' to drawings, Sheets 6, 11, 17, 20, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43, 47, 48, 49, 50, 53, 55, 57, 58, 62, 64, and 65.
- B. The attached revised sections are to be replaced in their entirety. All changes are generally identified, for convenience, either by strikeout for deletions, and underlining of text for additions, or a single dark line in the margin. All portions of the revised or new page shall apply whether or not changes have been indicated.
- C. Attached are the "transcript of proceedings" taken by the court reporter during the site visit conducted on 6 February 2003, as well as the site visit attendance sheet. These documents are for information only and are not to become part of the contract.
- D. Attached is the answer to the "Buy American Act" question that was raised during the site visit.
- E. The time and due date for submission of the technical and price proposals remains **unchanged**: 2:00 PM (PST), 26 February 2003.

F. Offerors must acknowledge receipt of this amendment by number and date on Standard Form 1442, BACK, in block 19, or by telegram.

Enclosures:

BID SCHEDULE

Section 00110

Sections 00800 (Special Clauses),

01270 Payments,

01501 Construction Facilities and Temporary Controls,

02300 Earthwork,

02316 Excavation, Trenching and Backfilling for Utilities Systems,

02741 Hot-Mix Asphalt (HMA) for Roads,

07210 Building Insulation,

07310 Asphalt Shingles.

07460 Siding,

07620 Sheet Metal Flashing and Trim,

12356 Kitchen and Bath Casework,

12491 Horizontal Louver Blinds and Drapery Rods,

15400 Plumbing,

16050 Basic Electrical Materials and Methods,

16121 Medium-Voltage Cable,

16123 (600 Volts and Less) Wire and Cable,

16130 Raceways and Boxes,

16140 Wiring Devices General,

16150 Wiring Connections,

16210 Electrical Utility Services General,

16271 Pad-Mounted Transformers,

16442 Load Centers,

16722 Residential Smoke and Carbon Monoxide/Gas Detectors.

Revision 'A' to drawings

Sheet 6,

Sheet 11,

Sheet 17,

Sheet 20,

Sheet 27,

Sheet 28,

Sheet 29,

Sheet 30,

Sheet 31,

Sheet 32,

Sheet 33,

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Sheet 42,
Sheet 43,
Sheet 47,
Sheet 48,
Sheet 49,
Sheet 50,
Sheet 53,
Sheet 55,
Sheet 57,
Sheet 58,
Sheet 62,
Sheet 64,
Sheet 65.
Site Visit "Transcript of Proceedings"
Sign-In Sheets, dated 28 January 2003
Buy American Act answer

BID SCHEDULE

REPLACE FAMILY HOUSING, PHASE 6A

<u>Item No.</u>	<u>Description of Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Amount</u>
<u>BASE ITEMS</u>					
0001	All Work for Construction of 5 Buildings (10 Units) in the Matador Housing Area within a line 5 feet outside the Building Wall Lines	1	JOB	L.S.	\$_____
0002	Provide Matador Housing Area Site Work and Utilities outside a line 5 feet outside the Building Wall Lines, except for Items 0013 and 0014	1	JOB	L.S.	\$_____
0003	All Work for Construction of 2 Buildings (4 Units) in Minuteman Housing Area within a line 5 feet outside the Building Wall Lines	1	JOB	L.S.	\$_____
0004	Provide Minuteman Housing Area Site Work and Utilities for Item 0003 outside a line 5 feet outside the Building Wall Lines, except for Items 0015 and 0016	1	JOB	L.S.	\$_____
0005	All Work for As-Built Drawings as Specified in Section 01702 from Preparation to Final Approval for Base Items and any Optional Items Exercised	1	JOB	L.S.	\$25,000
0006	All Work for O&M Manuals as Specified in Section 01701 from Preparation to Final Approval for Base Items and any Optional Items Exercised	1	JOB	L.S.	\$20,000
0007	All Work for Form 1354 Checklist and Equipment in Place List as Specified in Sections 01704 and 01705 from Preparation to Final Approval Base Items and any Optional Items	1	JOB	L.S.	\$12,000
TOTAL BASE ITEMS					\$_____
<u>OPTIONAL ITEMS</u>					
0008	All Work for Construction of 2 Additional Buildings (4 Units) in Minuteman Housing Area within a line 5 feet outside the Building Wall Lines	1	JOB	L.S.	\$_____
0009	Provide Minuteman Housing Area Site Work and Utilities for Item 0008 outside a line 5 feet outside the Building Wall Lines, except for Items 0017 and 0018	1	JOB	L.S.	\$_____

<u>Item No.</u>	<u>Description of Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Amount</u>
0010	Install Fencing for the Matador Housing Area Buildings (constructed in Item 0001) as shown on the Drawings (Trash enclosures and privacy fence at rear patio are included in Base Item 0001)	1	JOB	L.S.	\$_____
0011	Install Fencing for the Minuteman Housing Area Buildings (constructed in Item 0003) as shown on the Drawings (Trash enclosures and privacy fence at rear patio are included in Base Item 0003)	1	JOB	L.S.	\$_____
0012	Install Fencing for the Minuteman Housing Area Buildings (constructed in Item 0008) as shown on the Drawings (Trash enclosures and privacy fence at rear patio are included in Optional Item 0008)	1	JOB	L.S.	\$_____
0013	Install Underground Sprinkler System in Common Areas for Item 0002	1	JOB	L.S.	\$_____
0014	Install Trees in the Common Areas for Item 0002	1	JOB	L.S.	\$_____
0015	Install Underground Sprinkler System in Common Areas for Item 0004	1	JOB	L.S.	\$_____
0016	Install Trees in the Common Areas for Item 0004	1	JOB	L.S.	\$_____
0017	Install Underground Sprinkler System in Common Areas for Item 0009	1	JOB	L.S.	\$_____
0018	Install Trees in the Common Areas for Item 0009	1	JOB	L.S.	\$_____
0019	Provide Solid Surface Nonporous Countertops in lieu of Laminated Plastic Countertops in the Kitchens, <u>Baths and Utility Rooms</u> of the 5 Buildings Constructed in the Matador Housing Area under Base Item 0001	1	JOB	L.S.	\$_____
<u>0020</u>	<u>Provide Solid Surface Nonporous Countertops in lieu of Laminated Plastic Countertops in the Kitchens, Baths and Utility Rooms of the 2 Buildings Constructed in the Minuteman Housing Area under Base Item 0003</u>	<u>1</u>	<u>JOB</u>	<u>L.S.</u>	<u>\$_____</u>

<u>Item No.</u>	<u>Description of Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Amount</u>
0021	<u>Provide Solid Surface Nonporous Countertops in lieu of Laminated Plastic Countertops in the Kitchens, Baths and Utility Rooms of the 2 Additional Buildings Constructed in the Minuteman Housing Area under Optional Item 0008</u>	<u>1</u>	<u>JOB</u>	<u>L.S.</u>	<u>\$_____</u>
TOTAL OPTIONAL ITEMS					<u>\$_____</u>
TOTAL BASE AND OPTIONAL ITEMS					<u>\$_____</u>

NOTES:

1. The dollar amounts established in Items No. 0005, 0006 and 0007 shall not be revised by bidders.
2. If Option Item 0008 is awarded, Option Item 0009 will be awarded at the same time.

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**SECTION 00110
PROPOSAL SUBMISSION AND EVALUATION****1. INTRODUCTION.**

1.1. Your firm is invited to submit a proposal in response to Request for Proposal No. **DACA67-03-R-0207** entitled "**Replace Family Housing, Phase 6A, Malmstrom AFB, Montana** Prospective offerors are required to prepare and submit proposals that will be evaluated in accordance with this section of the solicitation. In accordance with Federal Acquisition Regulations (FAR), Part 15.101-2, proposals will be evaluated using the lowest price technically acceptable source selection process. The evaluation process will be to first determine those proposals that are technically acceptable and then from those proposals determine which firm is the lowest price. The firm offering the **lowest price technically acceptable offer will be awarded the contract.**

1.2. Project Description. This project consists of constructing 18 units in a duplex configuration, 8 units (4 buildings) at the Minuteman Village and 10 units (5 buildings) at the Matador Manor neighborhoods. Both sites will include access road in a cul-de-sac design with underground utilities and infrastructure. The housing components consist of two-story design with no basements. The design will be similar to the existing houses with steel siding in a two-pattern design, composition roof, insulated windows, some units with window shutters, carpeting, vinyl tile, porcelain floor tile, single car garage, landscaping and yard fencing.

2. EVALUATION FACTORS.**2.1. Technical Evaluation Factors.**

2.1.1. The technical evaluation factors identified below will be evaluated on an ACCEPTABLE/NON-ACCEPTABLE basis only:

2.1.1.1. Relevant Experience of the Prime Firm

2.1.1.2. Qualifications of Key Team Members

2.1.1.3. Past Performance

2.2. Basis of the source selection evaluation - This Section establishes the method to be implemented with regard to the evaluation of the proposals. Evaluation is to be based exclusively on the merits and contents of the proposal and any subsequent discussions required. Offerors not meeting the minimum requirements of all technical evaluation factors shall be determined to be **NON-ACCEPTABLE** and will not be considered for award. Technical Proposals will be evaluated on an **ACCEPTABLE** or **NON-ACCEPTABLE** basis only. Proposals must set forth full, accurate, and complete information as required by this RFP. Absence of information will be deemed as if no

support for that factor was provided. Award will be made to the lowest price technically acceptable offeror.

2.2.1. Technical Evaluation Ratings - Definitions

2.2.1.1. Acceptable: An acceptable rating indicates that the offeror has provided sufficient information to meet the minimum qualifications/standards described in the technical evaluation factor.

2.2.1.2. Non-Acceptable: A non-acceptable rating indicates that the offeror has not provided sufficient information to meet the minimum qualifications/standards described in the technical evaluation factor.

3. GENERAL SUBMITTAL REQUIREMENTS.

3.1. Proposals shall be submitted in two parts: (a) **technical proposal**, and (b) **price proposal**. Each shall be submitted in a separate envelope or package with the type of proposal (i.e., technical or price) clearly printed on the outside of the envelope or package. The maximum number of pages in the technical proposal should not exceed 60 one-sided pages with a font size no smaller than 10 point. Offerors submitting proposals should limit submission to data essential for evaluation of proposals so that a minimum of time and moneys are expended in preparing information required by the RFP. Proposals are to be on 8 ½ x 11-inch paper, to the maximum extent practicable, and submitted in standard letter (8½ x 11-inch) hardback loose-leaf binders. Contents of binders shall be tabbed and labeled to afford easy identification from the proposal Table of Contents. No material shall be incorporated by reference or reiteration of the RFP. Any such material will not be considered for evaluation. It shall be presented in a manner, which allows it to "STAND ALONE" without need for evaluators to reference other documents. Table of Contents, Index Tabs, and Photographs **will not** be considered a page. Unnecessarily elaborate brochures or other presentation materials beyond those sufficient to present complete and effective responses are not desired and may be construed as an indication of the proposer's lack of cost-consciousness. Penalty for making false statements in proposals is prescribed in 18 U.S.C. 1001.

4. MINIMUM SUBMITTAL REQUIREMENTS

4.1. Relevant experience of the prime firm. The Offeror shall submit three (3) projects demonstrating relevant experience, "Relevant experience is defined as experience constructing facilities similar in scope, cost, and complexity to the project in this solicitation. Only those projects for which the Offeror was the Prime Contractor and which were completed within the past ten (10) years should be submitted. The projects selected should clearly demonstrate the construction capabilities of the Offeror, for projects such as single family housing units, duplex family housing units, apartments, or other similar type family housing structures, for either civilian or military use" with one of the projects demonstrating construction experience performed in specific locations sharing similar climatic conditions to those of Malmstrom AFB, Montana. For purposes of evaluation, a severe climate is defined as climates that may experience a shortened construction season

due to severe or harsh cold weather conditions. The projects selected should clearly demonstrate the construction capabilities of the Offeror in one or more of the areas described in this paragraph. As a minimum, for each project listed, provide:

- 1) Project title and location
- 2) Dollar value of construction
- 3) Construction period (month/year start to month/year end)
- 4) Description of the project scope of work
- 5) Brief description of how the project is relevant, and meets the requirements of this RFP project.
- 6) Current primary point of contact for the customer (name, relationship to project, agency/firm affiliation, city and state, phone number).

4.2. Qualifications of key team members. The Offeror should submit the names and résumés for key construction personnel that will be assigned to this project. In addition, the Offeror will provide a concise summary of the duties and responsibilities for each of the proposed individuals which clearly indicates separate duties and responsibilities for each of the following positions; Project Superintendent, Project Manager, and Contractor Quality Control System Manager. The proposal should clearly present the separate credentials for each position of each person performing the duties of the position to which they are identified. Resumes should include examples of project experience, not to exceed three (3) examples, and educational qualifications, if applicable. It is expected that the key individuals in your proposal will be the individuals who perform work under the contract. **The contracting officer must approve substitute personnel.** Resumes should be no more than two (2) pages per individual and submitted in a format similar to the one below: As a minimum, this factor should include data on the following personnel:

4.2.1. Project Superintendent: The Project Superintendent shall have no less than 5 years experience as a project superintendent on construction projects of similar scope, size and complexity. The experience must demonstrate construction knowledge and ability to manage subcontracting teams, multiple buildings and be consistent with the type of construction provided for in this solicitation.

4.2.2. Project Manager: The Project Manager shall have a baccalaureate degree in a relevant field such as engineering, architecture or construction management with a minimum of three (3) projects that demonstrates the ability to construct projects similar in scope, cost and complexity to this contract **or** a person in the construction field with a minimum of 5 years in as a project manager on projects of the same scope, size and complexity of this contract.

4.2.3. CQC System Manager: The CQC (Contractor Quality Control) System Manager shall be a graduate engineer, graduate architect, or a graduate of construction management, with a minimum of 5 years construction experience on construction similar to this solicitation **or** a construction person with a minimum of 10 years in related work. (See Section 01451 for complete requirements for the CQC System Manager.)

4.2. Resume Format For Key Team Members. Resumes should be no more than two (2) pages per individual and submitted in a format similar to the one below

RESUME FORMAT***Name and Title***

- 1. Proposed Duties/Functions for this project***
- 2. Firm Affiliation and Years Affiliated***
- 3. Years of Experience performing duties/functions as proposed for this project.***
- 4. Education – School attended, Degree, Certification, Year, and Specialization***
- 5. List Active Registrations (Professional or Technical Licenses/Certifications)***
- 6. Describe Specific Qualifications for this project***
- 7. List Projects worked on to Include:***

Project Title & Location***Scope, Size and Complexity******Duties/Functions******Date of project***

- 8. Demonstrate how each project submitted is relevant to the project to be constructed under this solicitation.***

4.3. Past Performance of the Prime. Past performance of the prime contractor will be evaluated using the CCASS database. All performance ratings for the past ten (10) years shall be considered. If an offeror does not have past performance available in CCASS or wishes to augment the CCASS system ratings, the offerors may ask customers to submit the Customer Satisfaction Survey found at the end of this section. For each project constructed for Private Industry, provide a completed Customer Satisfaction Survey for each applicable project within the last ten 10 years. All Customer Satisfaction Surveys must be submitted to the Government from the customer or agency that is providing the information. Further instructions are found at the top of the Customer Satisfaction Survey. It is requested that only relevant projects be included. A relevant project is one of the same scope, cost and complexity as this solicitation. Should the offerors want to review the CCASS ratings contained in the Corps of Engineers CCASS Database, they may request the information by fax on company letterhead at the following telefax number: (503) 808-4596. The Government reserves the right to contact the evaluator on previous Government or Private Sector work to verify the Offeror's construction experience. In the case of an offeror without a record of past performance or for whom information on past performance is not available, the offeror **may not be evaluated as favorable or unfavorable** on past performance (See FAR 15.305(a)(2)(iv)). An overall rating of satisfactory or above on CCASS performance evaluations and an overall acceptable rating on Customer Satisfaction Surveys will be given an acceptable rating.

4.3.1. Offeror Submitted Surveys. Surveys submitted directly by the offeror may not be considered. Please ensure envelopes containing surveys being submitted to this office do not contain the offeror's return address.

4.3.2 As a maximum, no more than five (5) customer satisfaction surveys will be considered for the prime firm (i.e., the firm signing the Standard Form 1442,

Solicitation, Offer and Award) for work not listed (i.e. civilian projects) in the Government CCASS system.

5. PROPOSAL CONTENTS/FORMAT.

5.1. Technical Proposal Format. As a minimum, each copy of the technical proposal should contain the information and follow the general format specified below. Pages should be numbered from beginning to end, without repeating for new sections.

5.2. Technical Proposal Format- Five (5) sets required, original plus four (4) copies

TECHNICAL PROPOSAL FORMAT

1. *Technical Proposal Cover Letter, to include:*
 - a. *Solicitation Number*
 - b. *Name, address, and telephone and facsimile numbers of the Offeror (and electronic address, if available)*
 - c. *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*
 - d. *Name, 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*
 - e. *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.*
 - f. *Table of Contents. List all sections for the technical proposal. Any future amendments, additions and/or revisions to proposal shall include updated Table of Contents for each set.*
2. *Relevant Experience data*
3. *Qualifications of key team members.*
4. *Past Performance data.*

5.3. Price Proposal Format. The price proposal shall be submitted in an **ORIGINAL plus 1 copy** and must be signed by an official authorized to bind your firm. Note that Standard Form 1442, Block 13D, provides the number of calendar days after the date of the offer for which the proposal is firm. The price proposal, to be submitted at the same time as the technical proposal, should include:

5.4 Price Proposal - Original and one (1) copy

- *SF 1442, Solicitation, Offer and Award and Award and Corporate certificate*
- *Acknowledge all amendments by number and date in Block 19 on SF 1442 BACK*
- *Pricing Schedule*
- *Section 00600, Representation, Certifications and Other Statements of Offerors and Pre-award Information*
- *Banking and Bonding information*
- *Bid Bond*
- *Subcontracting plan (large business only)*

5.5. Additional Instructions.

5.5.1. Small Business Subcontracting - Plan Offerors must submit pricing for all items in the Schedule. In addition, **large businesses are required to submit a subcontracting plan** (See FAR Clause 52.219-9 Alt II, Small Business Subcontracting Plan, Jan 2002) with initial price proposals. Award will not be made under this solicitation without an approved subcontracting plan. (See the "Notice to Large Business Firms" located in the front of this solicitation.) Provide the name, point of contact, phone number, and address for the bank and bonding company of the firm signing the SF 1442.

5.5.2. Bid Bonds - Bid Bonds must be accompanied by a Power of Attorney containing an original signature from the surety, which must be affixed to the Power of Attorney after the Power of Attorney has been generated. Computer generated and signed Power's of Attorney will only be accepted if accompanied by an original certification from a current officer of the surety attesting to its authenticity and continuing validity.

6. PROPOSAL EVALUATIONS AND AWARD. A firm fixed-price contract will be awarded to one firm submitting the proposal that:

6.1. Conforms to this request for proposals (RFP),

6.2. Is the technically acceptable, lowest price offer, and

6.3. Is determined to be in the best interest of the Government.

6.4. To be considered for award, proposals shall conform to the terms and conditions contained in the RFP. No proposal shall be accepted that does not address all factors specified in this solicitation or which includes stipulations or qualifying conditions.

6.5. Price. Price will be evaluated for reasonableness and to assess the offeror's understanding of the contract requirements and any risk inherent in the offeror's approach. Financial capacity and bonding ability will be checked.

6.6. Award. It is the intent of the Government to make award based upon the lowest price technically acceptable initial offer, without further discussions or additional information. Therefore, proposals shall be submitted initially on the most favorable terms from a price and technical standpoint. Do not assume you will be afforded the opportunity to clarify, discuss or revise your proposal. If award is not made on initial offers, discussion will be conducted as described below.

6.7. Competitive Range. (FAR 15.306(c))

6.7.1. Competitive Range. After initial evaluation of proposals, if the Contracting Officer determines that discussions are required, the Contracting Officer will establish a competitive range comprised of the technically acceptable proposals. Discussions will be held with firms in the competitive range.

6.7.2. Discussions. Should it be necessary for discussions, the Government will conduct written discussions with only those offerors determined to be technically acceptable. If all proposals are determined to be non-acceptable, at the Contracting Officer's discretion, all firms may be requested to participate in discussions. As a result of discussions, offerors may make revisions to their initial offers. Discussions will culminate in a request for Final Proposal Revision, the date and time of which will be common to all offerors.

7. DEBRIEFINGS.

7.1 Pre-award. Offerors excluded from the competition before award will receive a notice and may request a debriefing before award by submitting a written request for a debriefing to the Contracting Officer within three (3) days after receipt of the notice of exclusion from the competition.

7.2 Post-award. Unsuccessful Offerors shall request post-award debriefing within three (3) days after the date on which the offeror received notification of contract award. Point-by-point comparisons with other offerors' proposals will not be made, and debriefings will not reveal any information that is not releasable under the Freedom of Information Act.

8. PROPOSAL EXPENSES AND PRECONTRACT COSTS PROPOSAL EXPENSES AND PRECONTRACT COSTS: This RFP does not commit the Government to pay costs incurred in preparation and submission of the initial and any subsequent proposals or any other costs incurred prior to execution of a formal contract.

**END OF SECTION 00110 -
SEE CUSTOMER SATISFACTION SURVEY
FOLLOWING THIS PAGE**

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SC-21	<u>DELETED</u> - VALUE ENGINEERING
SC-22	EPA ENERGY STAR
SC-23	RECOVERED MATERIALS

SECTION 00800

SPECIAL CLAUSES

SC-1. COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)
(FAR 52.211-10).

The Contractor shall be required to (a) commence work under this Contract within 10 calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than ~~440~~ 460 calendar days after date of receipt by Contractor of notice to proceed. The time stated for completion shall include final cleanup of the premises.

SC-1.1 OPTION FOR INCREASED QUANTITY

a. The Government may increase the quantity of work awarded by exercising any or all of the Optional Items 0008 through 0018 within 120 days of the receipt by the Contractor of the notice to proceed. The notice to proceed on work Items added by exercise of the options will be given upon execution of consent of surety.

b. The parties hereto further agree that any options herein shall be considered to have been exercised at the time the Government deposits written notification to the Contractor in the mails.

c. The time allowed for completion of the optional item awarded under this contract will be the same as that for the base items, and will be measured from the date of receipt of the notice to proceed for the base items.

SC-1.2 EXCEPTION TO COMPLETION PERIOD

In case the Contracting Officer determines that completion of seeding, sodding, and planting, and establishment of same is not feasible within the completion period(s) stated above, the Contractor shall accomplish such work in the first planting period following the contract completion period and shall complete such work as specified, unless other planting periods are directed or approved by the Contracting Officer.

SC-2. LIQUIDATED DAMAGES - CONSTRUCTION (APR 1984) (FAR 52.211-12)

(a) If the Contractor fails to complete the work within the time specified in the Contract, or any extension, the Contractor shall pay to the Government as liquidated damages, the sum of \$2130.00 for each day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, the resulting damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess cost of repurchase under the Termination clause in the CONTRACT CLAUSES.

(c) Exception to Liquidated Damage: In case the Contracting Officer determines that completion of work stated above in paragraph Exception to Completion Period is not feasible during the completion period stated in SC-1, such work will be exempted from liquidated damages.

SC-3 AND SC-4. DELETED.

SC-5. INSURANCE - WORK ON A GOVERNMENT INSTALLATION (SEP 1989) (FAR 52.228-5)

(a) The Contractor shall, at its own expense, provide and maintain during the entire performance period of this Contract at least the kinds and minimum amounts of insurance required in the Insurance Liability Schedule or elsewhere in the Contract.

(b) Before commencing work under this Contract, the Contractor shall certify to 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.

SC-5.1 REQUIRED INSURANCE IN ACCORDANCE WITH FAR 28.307-2:

(1) Workers' compensation and employer's liability. Contractors are required to comply with applicable Federal and State workers' compensation and occupational disease statutes. If occupational diseases are not compensable under those statutes, they shall be covered under the employer's liability section of the insurance policy, except when Contract operations are so commingled with a Contractor's commercial operation that it would not be practical to require this coverage. Employer's liability coverage of at least \$100,000 shall be required, except in states with exclusive or monopolistic funds that do not permit workers' compensation to be written by private carriers.

(2) General Liability.

(a) The Contracting Officer shall require bodily injury liability insurance coverage written on the comprehensive form of policy of at least \$500,000 per occurrence.

(b) Property damage liability insurance shall be required only in special circumstances as determined by the agency.

(3) Automobile liability. The Contracting Officer shall require automobile liability insurance written on the comprehensive form of policy. The policy shall provide for bodily injury and property damage liability covering the operation of all automobiles used in connection with performing the Contract. Policies covering automobiles operated in the United States shall

provide coverage of at least \$200,000 per person and \$500,000 per occurrence for bodily injury and \$20,000 per occurrence for property damage. The amount of liability coverage on other policies shall be commensurate with any legal requirements of the locality and sufficient to meet normal and customary claims.

(4) Aircraft public and passenger liability. When aircraft are used in connection with performing the Contract, the Contracting Officer shall require aircraft public and passenger liability insurance. Coverage shall be at least \$200,000 per person and \$500,000 per occurrence for bodily injury, other than passenger liability, and \$200,000 per occurrence for property damage. Coverage for passenger liability bodily injury shall be at least \$200,000 multiplied by the number of seats or passengers, whichever is greater.

(5) Environmental Liability If this contract includes the transport, treatment, storage, or disposal of hazardous material waste the following coverage is required.

The Contractor shall ensure the transporter and disposal facility have liability insurance in effect for claims arising out of the death or bodily injury and property damage from hazardous material/waste transport, treatment, storage and disposal, including vehicle liability and legal defense costs in the amount of \$1,000,000.00 as evidenced by a certificate of insurance for General, Automobile, and Environmental Liability Coverage. Proof of this insurance shall be provided to the Contracting Officer.

SC-6. DELETED

SC-7. PERFORMANCE OF WORK BY THE CONTRACTOR (APR 1984) (FAR 52.236-1): The Contractor shall perform on the site, and with its own organization, work equivalent to at least fifteen percent (15%) of the total amount of work to be performed under the Contract. The 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.

SC-8. PHYSICAL DATA (APR 1984) (FAR 52.236-4): Data and information furnished or referred to below is for the Contractor's information. The Government will not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

(a) Physical Conditions: The indications of physical conditions on the drawings and in the specifications are the result of site investigations by test holes shown on the drawings.

(b) Weather Conditions: Each bidder shall be satisfied before submitting his bid as to the hazards likely to arise from weather conditions. Complete weather records and reports may be obtained from any National Weather Service Office.

(c) Transportation Facilities: Each bidder, before submitting his bid, shall make an investigation of the conditions of existing public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress at the jobsite. The unavailability of transportation facilities or limitations thereon shall not become a basis for claims for damages or extension of time for completion of the work.

SC-9. DELETED

SC-10. LAYOUT OF WORK (APR 1984) (FAR 52.236-17): 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.

SC-11. THROUGH SC-13. DELETED.

SC-14. EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (MAR 1995)-
(EFARS 52.231-5000)

(a) 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 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. 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 used or a rate 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 retroactive 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.

(e) Copies of EP1110-1-8 "Construction Equipment Ownership and Operating Expense Schedule" Volumes 1 through 12 are available in Portable Document Format (PDF) only and can be viewed or downloaded at <http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/cecw.htm>. Copies of the CD-ROM (Volumes 1-12) are also available through either the Superintendent of Documents or Government bookstores. For additional information telephone 202-512-2250, or access on the Internet at http://www.access.gpo.gov/su_docs.

SC-15. PAYMENT FOR MATERIALS DELIVERED OFF-SITE (MAR 1995)-(EFARS 52.232-5000)

(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. In addition to petroleum products, payment for materials delivered off-site is limited to the following items. Any other construction material stored offsite may be considered in determining the amount of a progress payment.

SC-16 AND SC-17. DELETED

SC-18. CONTRACT DRAWINGS, MAPS, AND SPECIFICATIONS (OCT 1996) (52.0236-4001 EBS)

(a) The Government--

(1) Will provide the Contractor, without charge, one set of contract drawings and one set of specifications in electronic format on a compact disk. The Government will not give the Contractor any hard copy paper drawings or specifications for any contract resulting from this solicitation.

(b) The Contractor shall--

(1) check all drawings furnished immediately upon receipt;

(2) Compare all drawings and verify the figures before laying out the work;

(3) Promptly notify the Contracting Officer of any discrepancies; and

(4) Be responsible for any errors which might have been avoided by complying with this paragraph (b).

(c) Large scale drawings shall, in general, govern small scale drawings. Figures marked on drawings shall, in general, be followed in preference to scale measurements.

(d) Omissions from the drawings or specifications or the misdescription of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work, but shall be performed as if fully and correctly set forth and described in the drawings and specifications.

(e) The work shall conform to the specifications and the contract drawings identified in the index of drawings attached at the end of the Special Clauses.

SC-19. Through SC-21 DELETED.

SC-22. EPA ENERGY STAR: The Government requires that certain equipment be Energy Star compliant. Initially, the sole Energy Star requirement shall be the self certification by the bidder that the specified equipment is Energy Star compliant. Within 3 months of the availability of an EPA sanctioned test for Energy Star compliance, the Contractor shall submit all equipment upgrades and additions for testing and provide proof of compliance to the Government upon completion of testing. Testing shall be at the Contractor's expense.

SC-23. RECOVERED MATERIALS: The Corps of Engineers encourages all bidders to utilize recovered materials to the maximum extent practicable. The Contractor shall comply with the provisions of the Executive Order EO 13101 within the scope of his operations. The attached APPENDIX R contains procurement guidelines for products containing recovered materials. The Contractor shall fill out RECOVERED MATERIALS DETERMINATION FORM attached at the end of APPENDIX R and submit it to the Contracting Officer.

APPENDIX R

PART 247 - COMPREHENSIVE PROCUREMENT GUIDELINE FOR PRODUCTS CONTAINING RECOVERED MATERIALS

40 CFR Ch. 1 (9-1-99 Edition)

Subpart B-Item Designations

§ 247.10 Paper and paper products.

Paper and paper products, excluding building and construction paper grades.

§ 247.11 Vehicular products.

(a) Lubricating oils containing re-refined oil, including engine lubricating oils, hydraulic fluids, and gear oils, excluding marine and aviation oils.

(b) Tires, excluding airplane tire

(e) Reclaimed engine coolants, excluding coolants used in non-vehicular applications.

§ 247.12 Construction products.

(a) Building insulation product including the following items:

(1) Loose-fill insulation, including but not limited to cellulose fiber, mineral fibers (fiberglass and rock vermiculite, and perlite;

(2) Blanket and batt insulation, including but not limited to mineral fibers (fiberglass and rock wool);

(3) Board (sheathing, roof decking wall panel) insulation, including but not limited to structural fiberboard and laminated paperboard products perlite composite board, polyurethane, polyisocyanurate, polystyrene, phenolics, and composites; and

(4) Spray-in-place insulation, including but not limited to foam-in-place polyurethane and polyisocyanurate and spray-on cellulose.

(b) Structural fiberboard and laminated paperboard products for applications other than building insulation, including building board, sheathing shingle backer, sound deadening board, roof insulating board, insulating wallboard, acoustical and non-acoustical ceiling tile, acoustical and non-acoustical lay-in panels, floor underlayments, and roof overlay (coverboard).

(c) Cement and concrete, including concrete products such as pipe and block, containing coal fly as ground granulated blast furnace (GGBF) slag.

(d) Carpet made of polyester fiber use in low- and medium-wear applications.

(e) Floor tiles and patio blocks containing recovered rubber or plastic.

(f) Shower and restroom dividers/partitions containing recovered plastic or steel.

(g) (1) Consolidated latex paint used for covering graffiti; and

(2) Reprocessed latex paint used for interior and exterior architectural applications such as wallboard, ceilings, and trim; gutter boards; and concrete, stucco, masonry, wood and metal surfaces.

§247.13 Transportation products.

- (a) Traffic barricades and traffic cones used in controlling or restricting vehicular traffic.
- (b) Parking stops made from concrete or containing recovered plastic or rubber.
- (c) Channelizers containing recovered plastic or rubber.
- (d) Delineators containing recovered plastic, rubber, or steel.
- (e) Flexible delineators containing recovered plastic.

§ 247.14 Park and recreation products

- (a) Playground surfaces and running tracks containing recovered rubber or plastic.
- (b) Plastic fencing containing recovered plastic for use in controlling snow or sand drifting and as a warning/safety barrier in construction or other applications.

§ 247.15 Landscaping products.

- (a) Hydraulic mulch products containing recovered paper or recovered wood used for hydroseeding and as an over-spray for straw mulch in landscaping, erosion control, and soil reclamation.
- (b) Compost made from yard trimmings, leaves, and/or grass clippings for use in landscaping, seeding of grass or other plants on roadsides and embankments, as a nutritious mulch under trees and shrubs, and in erosion control and soil reclamation.
- (c) Garden and soaker hoses containing recovered plastic or rubber.
- (d) Lawn and garden edging containing recovered plastic or rubber.

§ 247.16 Non-paper office product.

- (a) Office recycling containers and office waste receptacles.
- (b) Plastic desktop accessories.
- (c) Toner cartridges.
- (d) Binders.
- (e) Plastic trash bags.
- (f) Printer ribbons.
- (g) Plastic envelopes.

§ 247.17 Miscellaneous products.

Pallets containing recovered wood, plastic, or paperboard.

RECOVERED MATERIALS DETERMINATION FORM

Instructions

This form is to be completed by the procurement originator when EPA-designated items included in the Affirmative Procurement Program for Recovered Materials are being procured from outside vendors. For questions on whether the product counts as "EPA designated" or what the required recycled content is, refer to product descriptions on EPA's website at <http://www.epa.gov/cpg>. This form is not required for items requisitioned from established Federal supply sources.

1. The procurement originator lists which item(s) apply to the procurement request, the required recycled content, the actual recycled content, and signs and dates the appropriate Certification on the back of this form.
2. If an exemption is being claimed, the procurement originator's unit commander also signs the Certification on the back of this form.
3. The completed form becomes part of the contracting office contract file.

Procurement Request No. _____

The EPA-designated items being procured are:

- Building insulation
- Flowable fill
- Latex paint
- Floor tiles
- Laminated paperboard
- Structural fiberboard
- Polyester carpet
- Carpet Backing
- Carpet Cushion
- Cement & concrete containing:
 - Coal fly ash
 - Ground granulated
blast furnace slag
- Binders
(paper, solid plastic or
plastic covered)
- Plastic presentation folders
- Plastic file folders
- Plastic clip portfolios
- Plastic clipboards
- Plastic envelopes
- Office recycling containers
- Office waste receptacles
- Plastic desktop accessories

- ___ Printing and writing papers
- ___ Printer ribbons
- ___ Toner cartridges
- ___ Awards and plaques
- ___ Playground surfaces
- ___ Park and recreational furniture
- ___ Running tracks
- ___ Playground equipment
- ___ Traffic barricades
- ___ Signage
- ___ Traffic cones
- ___ Channelizers
- ___ Delineators
- ___ Flexible delineators
- ___ Parking stops
- ___ Plastic fencing (snow or erosion control, safety barriers)
- ___ Engine coolants
- ___ Re-refined lubricating oils
- ___ Retread tires
- ___ Garden and soaker hoses
- ___ Lawn and garden edging
- ___ Patio blocks
- ___ Landscaping timbers and posts (plastic lumber)
- ___ Compost from yard trimmings or food waste
- ___ Commercial/industrial sanitary tissue products
- ___ Sorbents
- ___ Industrial Drums
- ___ Railroad grade crossings/ surfaces
- ___ Pallets
- ___ Paperboard and packaging
- ___ Strapping and stretch wrap
- ___ Shower & restroom dividers/partitions
- ___ Plastic trash bags
- ___ Mats
- ___ Hydraulic mulch
- ___ Tray liners
- ___ Newsprint

CERTIFICATION

Procurement Request No. _____

Complete Part A or Part B as appropriate:

A. I hereby certify the Statement of Work/Specifications for the requisition of all materials listed on this form complies with EPA standards for recycled/recovered materials content.

Procurement Originator's Signature

Date

B. The following item does not comply with EPA standards for recycled/recovered materials (please complete a separate justification for each noncompliant item purchased as part of this procurement action): _____

The exemption being claimed for this purchase is:

___ The product does not meet appropriate performance standards

___ The product is not available within a reasonable time frame

___ The product is not available competitively (from two or more sources)

___ The product is only available at an unreasonable price (it costs more than a comparable non-recycled-content product). The recycled-content product costs \$_____ per _____ and the non-recycled-content product costs \$_____ per _____

Procurement Originator

Date

Commander

Date

INDEX OF DRAWINGS

REPLACE FAMILY HOUSING, PHASE 6A
 MALMSTROM AFB, MONTANA
 PN: NZAS 04011

DRAWING FILE NO. 225s/711-15-09

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1	G-100	Title Sheet		03JAN17
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3	GT-101	Exploration Logs		
4	C-100A	Location of Exploration – Matador		
5	C-101A	Exist. Cond./Demo. Plan – Matador		
6	C-102A	Site Plan – Matador		
7	C-103A	Grading/Drainage Plan – Matador		
8	C-104A	Utilities Plan – Matador		
9	C-100B	Location of Explorations – Minuteman		
10	C-101B	Exist. Cond./Demo. Plan – Minuteman		
11	C-102B	Site Plan – Minuteman		
12	C-103B	Grading/Drainage Plan – Minuteman		
13	C-104B	Utilities Plan – Minuteman		
14	C-301	Storm Line Profiles – Minuteman		
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16	C-303	Water Line Profiles – Matador		
17	C-501	Civil Details		
18	C-502	Civil Details		
19	C-503	Civil Details		
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22	L101B	Landscape Plan – Minuteman		
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28	S-002	General Structure Notes and Abbreviations		
29	S-003	Fastening Schedule		
30	S-101	FDN/1 st Floor Framing Plan – Unit 3J		
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55	A-701	Stair Plans, Sections & Details – Unit 3J		
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62	E-002	Electrical Site Plan – Matador		
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	1	Hard Hat Sign	10SEP90

END OF SECTION

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SECTION 01270

PAYMENT

PART 1 GENERAL

1.1 GENERAL

The contract price for each item shall constitute full compensation for furnishing all plant, labor, materials, appurtenances, and incidentals and performing all operations necessary to construct and complete the items in accordance with these specifications and the applicable drawings, including surveying performed by the Contractor. Payment for each item shall be considered as full compensation, notwithstanding that minor features may not be mentioned herein. Work paid for under one item will not be paid for under any other item. No separate payment will be made for the work, services, or operations required by the Contractor, as specified in DIVISION 1, GENERAL REQUIREMENTS, to complete the project in accordance with these specifications; all costs thereof shall be considered as incidental to the work.

1.2 PAYMENT

1.2.1 ITEM NO. 0001 (BASE ITEM)

Payment will be made at the contract lump sum price for Item No. 0001, All Work for Construction of 5 Buildings (10 Units) in the Matador Housing Area within a line 5 feet outside the Building Wall Lines, payment of which shall constitute full compensation for Item No. 0001, complete. Work this item includes labor, professional services, materials, equipment and transportation and other work as required.

1.2.2 ITEM NO. 0002 (BASE ITEM)

Payment will be made at the contract lump sum price for Item No. 0002, Provide all Matador Housing Area Site Work and Utilities for Item No. 0001 outside a line 5 feet outside the Building Wall Lines except for Items 0013 and 0014, payment of which shall constitute full compensation for Item No. 0002, complete. Work this item includes all labor, professional services, materials, equipment and transportation necessary for all work related to this item.

1.2.3 ITEM NO. 0003 (BASE ITEM)

Payment will be made at the contract lump sum price for Item No. 0003, All Work for Construction of 2 Buildings (4 Units) in Minuteman Housing Area within a line 5 feet outside the Building Wall Lines, payment of which shall constitute full compensation for Item No. 0003, complete. Work this item includes labor, professional services, materials, equipment and transportation and other work as required.

1.2.4 ITEM NO. 0004 (BASE ITEM)

Payment will be made at the contract lump sum price for Item No. 0004, Provide Minuteman Housing Area Site Work and Utilities for Item 0003 outside a line 5 feet outside the Building Wall Lines except for Items 0015 and 0016, payment of which shall constitute full compensation for Item No. 0004, complete. Work this item includes all labor, professional services, materials, equipment and transportation necessary for all work related to this item.

1.2.5 ITEM NO. 0005 (BASE ITEM)

Payment will be made at the contract lump sum price for Item No. 0005, All Work for As-Built Drawings as Specified in Section 01702 from Preparation to Final Approval for Base Items and any Optional Items Exercised, payment of which shall constitute full compensation for Item No. 0005, complete. No partial or total payment will be made for this item until the as-built drawings, both marked up blue prints and electronic files are fully approved by the Government (A or B action) and all copies of approved drawings and electronic media received by the Government. The dollar amount specified in the Bid Schedule may not necessarily reflect the bidder's actual costs for doing this work.

1.2.6 ITEM 0006 (BASE ITEM)

Payment will be made at the contract lump sum price for Item No. 0006, All Work for O&M Manuals, as Specified in Section 01701 from Preparation to Final Approval for Base Items and any Optional Items Exercised, payment of which shall constitute full compensation for Item No. 0006, complete. No partial or total payment will be made for this item until all O&M manuals are fully approved by the Government (A or B action) and all copies of final manuals are received by the Government in their final binders. The dollar amount specified in the Bid Schedule may not necessarily reflect the bidder's actual costs for doing this work.

1.2.7 ITEM 0007 (BASE ITEM)

Payment will be made at the contract lump sum price for Item No. 0007, All Work for Form 1354 Checklist and Equipment-in-Place List, as Specified in Section 01704 and 01705 from Preparation to Final Approval for Base Items and any Optional Items Exercised, payment of which shall constitute full compensation of Item No. 0007, complete. No partial or total payment will be made for this item until both the 1354 Checklist and Equipment in Place List are fully approved by the Government (A or B action) and all copies of approved lists received by the Government. The dollar amount specified in the Bid Schedule may not necessarily reflect the bidder's actual costs for doing this work.

1.2.8 ITEM 0008 (OPTIONAL ITEM)

Payment will be made at the contract lump sum price for Item No. 0006, All Work for Construction of 2 Additional Buildings (4 Units) in Minuteman Housing Area within a line 5 feet outside the Building Wall Lines, payment of which shall constitute full compensation for Item No. 0008, complete. Work this item includes all labor, professional services, materials, equipment and transportation and all other work as required.

1.2.9 ITEM 0009 (OPTIONAL ITEM)

Payment will be made at the contract lump sum price for Item No. 0009, Provide Minuteman Housing Area Site Work and Utilities for Item 0008 outside a line 5 feet outside the Building Wall Lines except for Items 0017 and 0018, payment of which shall constitute full compensation for Item No. 0009, complete. Work this item includes all labor, professional services, materials, equipment and transportation necessary for all work related to this item.

1.2.10 ITEM 0010 (OPTIONAL ITEM)

Payment will be made at the contract lump sum price for Item No. 0010, Install Fencing for the Matador Housing Area Buildings (constructed in Item 0001) as Shown on the Drawings, payment

of which shall constitute full compensation for Item No. 0010, complete. Work this item includes all labor, professional services, materials, equipment and transportation and all other work as required. Trash enclosures and privacy fence at rear patio are included in Base Item 0001.

1.2.11 ITEM 0011 (OPTIONAL ITEM)

Payment will be made at the contract lump sum price for Item No. 0011, Install Fencing for the Minuteman Housing Area Buildings (constructed in Item 0003) as Shown on the Drawings, payment of which shall constitute full compensation for Item No. 0011, complete. Work this item includes all labor, professional services, materials, equipment and transportation and all other work as required. Trash enclosures and privacy fence at rear patio are included in Base Item 0003.

1.2.12 ITEM 0012 (OPTIONAL ITEM)

Payment will be made at the contract lump sum price for Item No. 0012, Install Fencing for the Minuteman Housing Area Buildings (constructed in Item 0008) as Shown on the Drawings, payment of which shall constitute full compensation for Item No. 0012, complete. Work this item includes all labor, professional services, materials, equipment and transportation and all other work as required. Trash enclosures and privacy fence at rear patio are included in Optional Item 0008.

1.2.13 ITEM 0013 (OPTIONAL ITEM)

Payment will be made at the contract lump sum price for Item No. 0013, Install Underground Sprinkler System in Common Areas for Item 0002, payment of which shall constitute full compensation for Item No. 0013, complete. Work this item includes all labor, professional services, materials, equipment and transportation and all other work as required.

1.2.14 ITEM 0014 (OPTIONAL ITEM)

Payment will be made at the contract lump sum price for Item No. 0014, Install Trees in the Common Areas for Item 0002, payment of which shall constitute full compensation for Item No. 0014, complete. Work this item includes all labor, professional services, materials, equipment and transportation necessary for all work related to this item.

1.2.15 ITEM 0015 (OPTIONAL ITEM)

Payment will be made at the contract lump sum price for Item No. 0015, Install Underground Sprinkler System in Common Areas for Item 0004, payment of which shall constitute full compensation for Item No. 0015, complete. Work this item includes all labor, professional services, materials, equipment and transportation and all other work as required.

1.2.16 ITEM 0016 (OPTIONAL ITEM)

Payment will be made at the contract lump sum price for Item No. 0016, Install Trees in the Common Areas for Item 0004, payment of which shall constitute full compensation for Item No. 0016, complete. Work this item includes all labor, professional services, materials, equipment and transportation and all other work as required.

1.2.17 ITEM 0017 (OPTIONAL ITEM)

Payment will be made at the contract lump sum price for Item No. 0017, Install Underground Sprinkler System in the Common Areas for Item 0009, payment of which shall constitute full compensation for Item No. 0017, complete. Work this item includes all labor, professional services, materials, equipment and transportation and all other work as required.

1.2.18 ITEM 0018 (OPTIONAL ITEM)

Payment will be made at the contract lump sum price for Item No. 0018, Install Trees in the Common Areas for Item 0009, payment of which shall constitute full compensation for Item No. 0018, complete. Work this item includes all labor, professional services, materials, equipment and transportation and all other work as required.

1.2.19 ITEM 0019 (OPTIONAL ITEM)

Payment will be made at the contract lump sum price for Item No. 0019, Provide Solid Surface Nonporous Countertops in lieu of Laminated Plastic Countertops in the Kitchens, Baths and Utility Rooms of the 5 Buildings Constructed in the Matador Housing Area under Base Item 0001, payment of which shall constitute full compensation for Item No. 0019, complete. The dollar amount of this item is the difference in cost between solid surface nonporous countertops and laminated plastic countertops. Work this item includes all labor, professional services, materials, equipment and transportation and all other work as required.

1.2.20 ITEM 0020 (OPTIONAL ITEM)

Payment will be made at the contract lump sum price for Item No. 0020, Provide Solid Surface Nonporous Countertops in lieu of Laminated Plastic Countertops in the Kitchens, Baths and Utility Rooms of the 2 Buildings Constructed in the Minuteman Housing Area under Base Item 0003, payment of which shall constitute full compensation for Item No. 0020, complete. The dollar amount of this item is the difference in cost between solid surface nonporous countertops and laminated plastic countertops. Work this item includes all labor, professional services, materials, equipment and transportation and all other work as required.

1.2.21 ITEM 0021 (OPTIONAL ITEM)

Payment will be made at the contract lump sum price for Item No. 0021, Provide Solid Surface Nonporous Countertops in lieu of Laminated Plastic Countertops in the Kitchens, Baths and Utility Rooms of the 2 Additional Buildings Constructed in the Minuteman Housing Area under Optional Item 0008, payment of which shall constitute full compensation for Item No. 0021, complete. The dollar amount of this item is the difference in cost between solid surface nonporous countertops and laminated plastic countertops. Work this item includes all labor, professional services, materials, equipment and transportation and all other work as required.

1.3 PROGRESS PAYMENT INVOICE

Requests for payment shall be submitted in accordance with Federal Acquisition Regulations (FAR) Subpart 32.9, entitled "PROMPT PAYMENT", and Paragraphs 52.232-5 and 52.232-27, entitled "Payments Under Fixed-Price Construction Contracts", and "Prompt Payment for Construction Contracts", respectively. In addition each request shall be submitted in the number of copies and to the designated billing office as shown in the Contract.

1.3.1 When submitting payment requests, the Contractor shall complete Blocks 1 through 12 of

the "PROGRESS PAYMENT INVOICE" Form as directed by the Contracting Officer. (A sample form is attached at the end of this Technical Specification Section.) The completed form shall then become the cover document to which all other support data shall be attached.

1.3.2 One additional copy of the entire request for payment, to include the "PROGRESS PAYMENT INVOICE" cover document, shall be forwarded to a separate address as designated by the Contracting Officer.

PARTS 2 and 3 NOT USED

PROGRESS PAYMENT INVOICE
 See Federal Acquisition Regulations (FAR) 32.900, 52.232-5, & 52.232-27

1. PROJECT AND LOCATION	2. DATE
3. CONTRACTOR NAME AND ADDRESS (Must be the same as in the Contract)	4. CONTRACT NO. _____
6. DESCRIPTION OF WORK	5. INVOICE NO. _____
8. DISCOUNT TERMS	7. PERIOD OF PERFORMANCE From: To:
9. OFFICIAL TO WHOM PAYMENT IS TO BE FORWARDED Name: Title: Phone: () -	10. OFFICIAL TO BE NOTIFIED OF DEFECTIVE INVOICE Name: Title: Phone () -
<p>11. CERTIFICATION: I hereby certify, to the best of my knowledge and belief, that</p> <p>(1) The amounts requested are only for the performance in accordance with the specifications, terms, and conditions of this contract;</p> <p>(2) Payments to subcontractors and suppliers have been made from previous payments received under the contract, and timely payments will be made from the proceeds of the payment covered by this certification,</p> <p>in accordance with subcontract agreements and the requirements of Chapter 39 of Title 31, United States Code;</p> <p>and</p> <p>(3) This request for progress payment 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.</p>	
_____ (Signature)	_____ (Title)
_____ (Date)	
<p>12. OTHER INFORMATION OR DOCUMENTATION required by Contract. Provide two (2) copies of each (check and attach if applicable):</p> <p>_____ Updated Progress Chart/Schedule</p> <p>_____ Progress Narrative</p> <p>_____ Certified Payrolls (submitted weekly)</p> <p>_____ Safety Exposure Report</p> <p>_____ Updated Submittal Register</p> <p>_____ Progress Photos</p> <p>_____ Subcontractor/Employee Listings</p>	<p align="center">(FOR GOVERNMENT USE ONLY)</p> <p>Retainage: _____% Amt.: \$ _____</p> <p>Withholdings: \$ _____</p> <p>Reason: _____ _____</p> <p>Following items are current:</p> <p>As-Builts _____ Yes _____ No</p> <p>O & M Manuals _____ Yes _____ No</p> <p>1354 Data _____ Yes _____ No</p> <p>Submittal Register _____ Yes _____ No</p>

END OF SECTION

SECTION 01501

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.1 AVAILABILITY OF UTILITY SERVICES

1.1.1 Water

The Government will make available reasonable amounts of potable water to the Contractor, from existing outlets and supplies, without charge. Contractor shall reasonably conserve potable water furnished. The contractor, at his own expense, shall install and maintain all necessary temporary connections and distribution lines as require for delivery of water to points of usage and shall remove the connections and lines prior to final acceptance of construction. Contractor shall restore utility to original condition, and repair any damage to the utility caused by temporary connection.

1.1.2 Electricity

Subject to available supply, reasonable amounts of electric power will be furnished by the Government without charge from existing outlets and supplies. The Contractor shall carefully conserve electricity furnished. The Contractor, at its own expense and in a manner satisfactory to the Contracting Officer, shall install and maintain necessary temporary connections including transformers and related equipment as needed and shall remove the same prior to final acceptance of the construction. The Contractor shall restore utility to original condition, and repair any damage to the utility caused by temporary connection. Government furnished electrical power shall not be used for temporary heat.

1.1.3 Natural Gas

The Government will make available to Contractor, from existing outlets and supplies, reasonable amounts of natural gas without charge. The Contractor shall reasonably conserve natural gas furnished. The Contractor, at its own expense, shall install and maintain necessary temporary connections and distribution lines and shall remove all temporary connections and lines prior to final acceptance of construction. Contractor shall restore utility to original condition, and repair any damage to the utility caused by temporary connection.

1.1.3 Sanitary Provisions

Contractor shall provide and maintain sanitary accommodations approved by the Contracting Officer for the use of employees as may be necessary, shall comply with the requirements and regulations of the Health Department, County Sanitarian, or other authorities having jurisdiction, and shall be in accordance with the requirements of the Corps of Engineers Safety and Health Requirements Manual EM 385-1-1.

The Government will make available to Contractor, from existing outlets and supplies, access to sanitary sewer systems without charge. The contractor shall at his own expense install and maintain temporary connections and accommodations in accordance with all requirements of

the State of Montana Health Department, Base Civil Engineer, other authorities having jurisdiction, and in accordance with the requirements of the Corps of Engineers Safety and Health Requirements Manual EM 385-1-1. The contractor shall at his own expense restore the utility to its original condition, and repair any damage to the utility caused by temporary connection. Under no circumstances shall contaminated water as defined by RCRA, surface water, rainwater, waters related to dewatering activities, or similar be introduced into the sanitary sewer system.

1.1.4 Telephone Service

Contractor shall make arrangements and pay all costs for telephone facilities desired including connection fees. Use of Government telephone service will not be permitted except in emergency situations or as otherwise approved by the Contracting Officer.

NOTE: All utility connections and details shall be as approved by the Contracting Officer's Representative prior to connection and use. The availability of government furnished utilities is subject to local availability and existing infrastructure. The government makes no guarantee that temporary connection to such utilities will be economical or feasible. The supply of government owned utilities or the lack thereof shall not be the basis for any claim against the government.

1.3 TEMPORARY ELECTRIC WIRING

1.3.1 Temporary Power and Lighting

The Contractor shall provide construction power facilities in accordance with the safety requirements of the National Electric Code NFPA No. 70 and the SAFETY AND HEALTH REQUIREMENTS MANUAL EM 385-1-1. The Contractor, or its delegated subcontractor, shall enforce the safety requirements of electrical extensions for the work of subcontractors. Skilled electrical tradesmen shall accomplish all work.

1.3.1.1 Contractor shall provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

1.3.1.2 Contractor shall maintain lighting and provide all repairs.

1.3.2 Meters and Temporary Connections

The Contractor, at its own expense and in a manner satisfactory to the Contracting Officer, shall provide and maintain necessary temporary connections and distribution lines. The Contractor shall notify the Contracting Officer, in writing, 5 working days before final electrical connection is desired. The Government will make the final hot connection after inspection and approval of the Contractor's temporary wiring installation. The Contractor shall not make the final electrical connection.

1.3.3 Submittals

Submit detailed drawings of temporary power connections. Drawings shall include, but not be limited to, main disconnect, grounding, service drops, service entrance conductors, feeders, GFCI'S, and all site trailer connections.

1.4 FIRE PROTECTION

During the construction period, the Contractor shall provide fire extinguishers in accordance with the safety requirements of the SAFETY AND HEALTH REQUIREMENTS MANUAL, EM 385-1-1. The Contractor shall remove the fire extinguishers at the completion of construction.

1.5 UTILITY LOCATOR/IDENTIFICATION TAPE

Unless specified otherwise elsewhere in the Contract, all installed utility lines shall have a plastic marker tape minimum 150 mm wide and 0.125 mm thick, installed 200 mm to 260 mm below grade, and brightly colored. The plastic marker tape shall include a metallic wire or metal foil backing for detection purposes, and shall bear a continuous printed inscription describing the type of utility line buried below. All underground exterior gas lines shall be provided with a continuous tracer wire (#12 wire) taped to the pipe. Utility line monument markers (concrete with brass identification plugs) shall be installed every 60 meters along straight runs and at each change of direction. Any existing marker tapes or tracer wires damaged during construction shall be repaired to original condition.

1.6 STAGING AREA

Contractor will be provided adequate open staging area adjacent to the site, as directed by the Contracting Officer. Area is unsecured, and Contractor shall make provisions for its own security. See Section 01005 SITE SPECIFIC SUPPLEMENTARY REQUIREMENTS, paragraph 1.4 Construction and Staging Area Fence for staging area fencing. The fence shall be gated and locked when not attended by the contractor's staff.

Contractor shall be responsible for keeping staging area, and office area clean and free of weeds and uncontrolled vegetation growth. Weeds shall be removed by pulling or cutting to within 1-inch of ground level. Lawn areas shall be mown to keep growth to less than 2-inches. All loose debris and material subject to being moved by prevailing winds in the area shall be picked up or secured at all times.

Temporary storage buildings (excluding tractor trailers) sited in the area shall conform to the base color scheme (Antique Linen, Fed. No. 23578). Architectural and structural features of all temporary facilities, including tractor trailers, shall be maintained in good repair as required by the Contracting Officer. Staging area shall be enclosed by chain link fence 1.8 m high, with access gates. Spare keys to any locked gates shall be provided to the base Fire Department dispatch office. Area shall be kept clean, orderly and free of debris, demolished materials, etc. at all times. If the area is not maintained in a safe and clean condition as defined above, the Contracting Officer may direct the Contractor to perform such actions as necessary to bring the area and facilities up to base standards at no additional cost to the Government, or have the area cleaned by others with the costs being deducted from the Contractor's payment.

1.7 HOUSEKEEPING AND CLEANUP

Pursuant to the requirements of Clause CLEANING UP and Clause ACCIDENT PREVENTION, of the CONTRACT CLAUSES, the Contractor shall assign sufficient personnel to insure compliance. The Contractor shall submit a detailed written plan for implementation of this requirement. The plan will be presented as part of the pre-construction safety plan and will provide for keeping the total construction site, structures, and access ways free of debris and

obstructions at all times. Work will not be allowed in those areas that, in the opinion of the Contracting Officer, have unsatisfactory cleanup and housekeeping at the end of the preceding day's normal work shift. At least once each day all areas shall be checked by the Quality Control person of the Contractor and the findings recorded on the Quality Control Daily Report. In addition, the Quality Control person shall take immediate action to insure compliance with this requirement. Housekeeping and cleanup shall be assigned by the Contractor to specific personnel. The name(s) of the personnel shall be available at the project site.

1.8 CONSTRUCTION NEAR COMMUNICATIONS CABLES

1.8.1 Excavation Near Communication Cables

Digging within 3 feet of buried communication cables (including fiber optic cables), electrical cables, and natural gas lines shall be performed by hand digging until the utility is exposed. The Project Inspector shall be notified 3 days prior to digging within a 3-foot area near this utility. A representative from Communications (Telco) must be present during excavation of Communications Cables. The cable piping routes must be marked prior to excavation in the area. A work clearance permit (AF Form 103) must be obtained from Base Civil Engineer Construction Management prior to any excavation work. Information on location of existing utilities will be available with the permit. Air Force personnel will locate the utilities only one time for digging permit purposes. It is the Contractor's responsibility from then on, through acceptance of the project. The Contractor shall be held responsible for any damage to the utility by excavation procedures. Once the utility is exposed, mechanical excavation may be used if there is no chance of damage occurring to the cable or piping systems.

1.8.2 Reburial of Exposed Utilities

When existing utility lines are reburied, a tape, detectable by pipe detector systems, shall be installed above the uncovered length of the utility. See paragraph UTILITY LOCATOR/IDENTIFICATION TAPE above for specific tape requirements.

1.8.3 Access to Communications Manhole or Handhole

No communications manhole or handhole shall be entered without first obtaining a fiber optic cable briefing. Contractor shall coordinate through the Contracting Officer with the Base Communications Officer.

1.8.4 Cable Cuts or Damage

If a communications cable is cut or damaged the Contractor shall immediately notify the Contracting Officer (CO) and begin gathering personnel and equipment necessary to repair the cut, or damage. Contractor shall begin repairs within one hour of the cut or damage, unless notified otherwise, and continue repairs without interruption until full service is restored.

1.9 PROJECT SIGN

Contractor shall furnish and install 2 project signs (one at Minuteman Housing Area and one at Matador Housing Area) in accordance with conditions hereinafter specified and layout shown on drawing No. 49s-40-05-15, Sheets 1 and 2, except Corps of Engineers' castle and Department of Air Force seal will be Government furnished. All letters shall be block type, upper case.

Letters shall be painted as indicated using exterior-type paint. Sign shall be maintained in excellent condition throughout the life of job. Project signs shall be located as directed. Upon completion of project, signs shall be removed and shall remain the property of Contractor.

1.10 ELEVATED WORK AREAS

Workers in elevated work areas in excess of 6 feet above an adjoining surface require special safety attention. In addition to the provisions of SAFETY AND HEALTH REQUIREMENTS MANUAL, EM 385-1-1, the following safety measures are required to be submitted to the Contracting Officer's Representative. Prior to commencement of work in elevated work areas, the Contractor shall submit drawings depicting all provisions of his positive fall protection system including, but not limited to, all details of guardrails. Positive protection for workmen engaged in the installation of structural steel and steel joist shall be provided by safety nets, tie-offs, hydraulic man lifts, scaffolds, or other required means. Decking crews must be tied-off or work over nets or platforms not over 6 feet below the work area. Walking on beams and/or girders and the climbing of columns is prohibited without positive protection. Perimeter guardrails shall be installed at floor, roof, or wall openings more than 6 feet above an adjoining surface and on roof perimeters. Rails shall be designed to protect all phases of elevated work including, but not limited to, roofing operations and installation of gutters and flashing. Rails around roofs may not be removed until all work on the roof is complete and all traffic on or across the roof ceases. Rails shall be designed by a licensed engineer to provide adequate stability under any anticipated impact loading. As a minimum, the rails shall consist of a top rail at a height of 1 meter, a mid-rail, and a toe board. Use of tie-offs, hydraulic man lifts, scaffolds, or other means of roof edge protection methods may be utilized on small structures such as family housing, prefabricated metal buildings, etc. If safety belts and harnesses are used, the positive fall protection plan will address fall restraint versus fall arrest. Body belts will ONLY be used for fall restraint, they will not be used for fall arrest.

1.11 CONCEALED WORK

All items of work to be concealed shall be Government inspected prior to concealment.

1.12 REPAIR OF ROAD CUTS

Asphaltic surface shall be completely in place within 48 hours after placement of base gravel. Between placement of base gravel and pavement, road shall be kept in drivable and passable condition.

1.13 CONSTRUCTION PLANNING MEETINGS

Contractor shall attend a weekly scheduling meeting with the Contracting Officer's Representative and a representative of the using service. During the meeting, the Contractor shall be required to present in writing, and discuss his specific construction plans for, the following 2-week period. The first week's schedule shall be firm and the second weeks' schedule may be tentative and subject to change as conditions warrant. The schedule shall be detailed describing planned work activities, crew sizes and locations, and any utility and access restrictions to base activity which may be caused by planned construction. Any scheduling of outages will be performed at this meeting. Any Contractor activity affecting base security needs, such as scattered crews and number of workers per crew, will be detailed in the written

schedule and discussed during the meeting. This weekly meeting is in addition to the construction progress charts or network analysis submission requirements.

1.14 TRAFFIC CONTROL PLAN

The Contractor shall submit an overall Traffic Control Plan for moving traffic through and around the construction zone in a manner that is conducive to the safety of motorists, pedestrians, and workers. This plan shall indicate scheduling, placement, and maintenance of traffic control devices in accordance with the U.S. Department of Transportation, Federal Highway Administration publication, Manual on Uniform Traffic Control Devices. A specific plan depicting placement and type of signage, barricades, barriers, and related items shall be submitted to the government and approved a minimum of 2 weeks prior to each individual road closure, detour, or partial blockage of roadway, sidewalk, or bike path.

1.14.1 Government Approval

The Contractor shall obtain, in writing, from the Base Civil Engineer's Traffic Engineer, through the Contracting Officer, approval of the Traffic Control Plan. The Contractor shall submit the Traffic Control Plan at least 15 working days prior to commencement of street or road work. Streets (except dead end) may be closed to traffic temporarily (except at least one access lane shall be kept open to traffic) by approved written request to the Contracting Officer at least 10 working days prior to street closure. Excavations shall not remain open for more than 1 working day without approval.

~~1.14.2 Related Requirements~~

~~Refer to Section 01005 SITE SPECIFIC SUPPLEMENTARY REQUIREMENTS paragraph 1.8 for additional traffic control measures.~~

1.15 UTILITIES NOT SHOWN

The Contractor can expect to encounter, within the construction limits of the entire project, utilities not shown on the drawings and not visible as to the date of this contract. The Contractor shall scan the construction site with electromagnetic or sonic equipment, and mark the surface of the ground where existing utilities are discovered. The Contractor shall verify the elevations of existing utilities, piping and any type of underground obstruction not indicated, or indicated and not specified to be removed. If such utilities interfere with construction operations, he shall immediately notify the Contracting Officer verbally and then in writing to enable a determination by the Contracting Officer as to the necessity for removal or relocation. If such utilities are removed or relocated as directed, the Contractor shall be entitled to equitable adjustment for any additional work or delay. The types of utilities the Contractor may encounter are waterlines, sewer lines (storm and sanitary), gas lines, fueling lines, steam lines, buried fuel tanks, septic tanks, other buried tanks, communication lines, cathodic protection cabling, and power lines. These utilities may be active or abandoned utilities.

1.16 GOVERNMENT WITNESSING AND SCHEDULING OF TESTING

The Contractor shall notify the Contracting Officer, by serial letter, of dates and agenda of all performance testing of the following systems: mechanical (including fire protection and EMCS) and electrical (including fire protection), a minimum of 10 calendar days prior to start of such

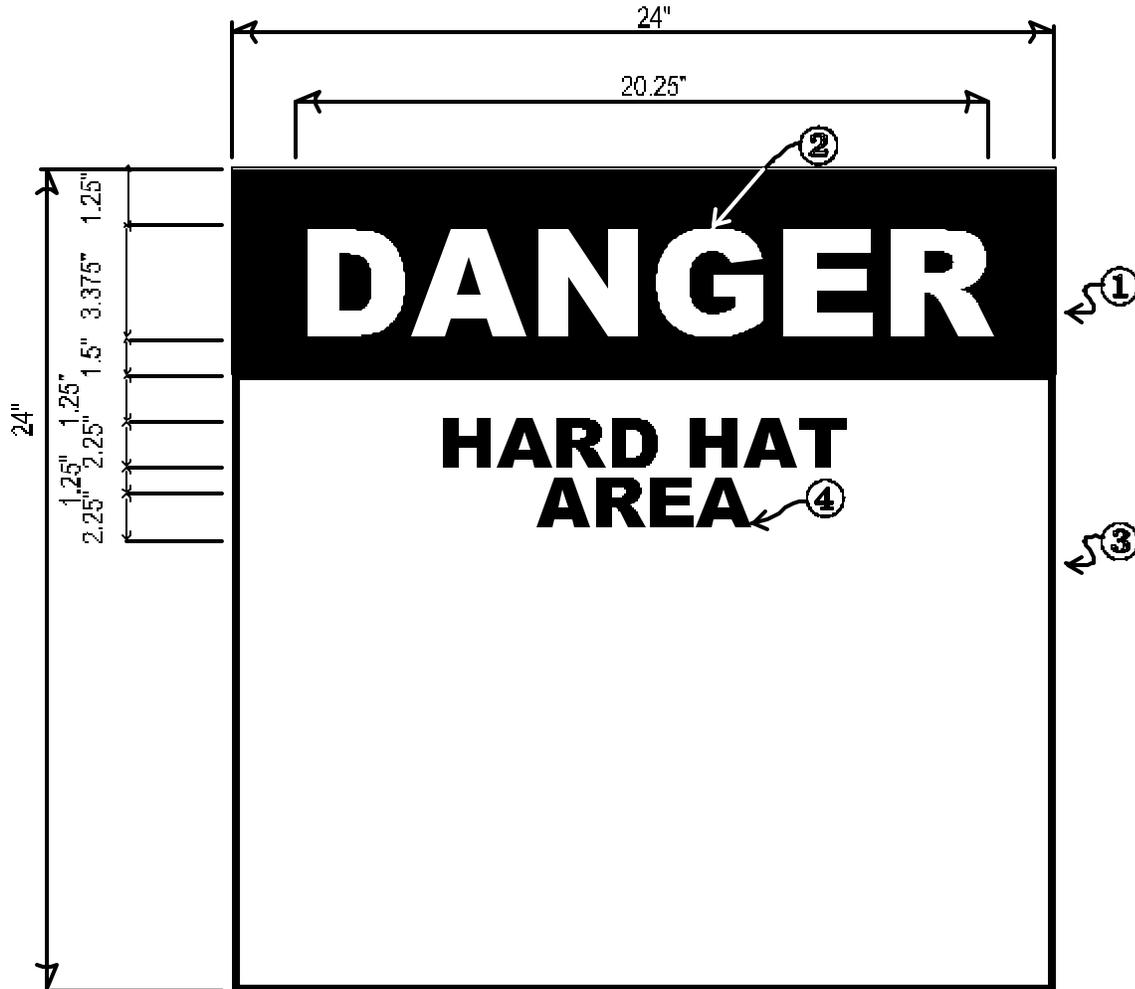
testing. In this notification, the Contractor shall certify that all equipment, materials, and personnel necessary to conduct such testing will be available on the scheduled date and that the systems have been prechecked by him and are ready for performance and/or acceptance testing. Contractor shall also confirm that all operations and maintenance manuals have been submitted and approved. NO PERFORMANCE AND/OR ACCEPTANCE TESTING WILL BE PERMITTED UNTIL THE OPERATIONS AND MAINTENANCE MANUALS HAVE BEEN APPROVED.

Government personnel, at the option of the Government, will travel to the site to witness testing. If the testing must be postponed or canceled for whatever reason not the fault of the government, the Contractor shall provide the Government not less than 3 working days advance notice (notice may be faxed) of this postponement or cancellation. Should this 3 working day notice not be given, the Contractor shall reimburse the Government for any and all out of pocket expenses incurred for making arrangements to witness such testing including, but not limited to airline, rental car, meal, and lodging expenses. Should testing be conducted, but fail and have to be rescheduled for any reason not the fault of the Government, the Contractor shall similarly reimburse the Government for all expenses incurred.

1.17 HARD HAT SIGNS

The Contractor shall provide 24 x 24 inch square Hard Hat Area signs at each entry to the project or work area as directed by the Contracting Officer. A minimum of two signs will be required. Signs shall be in accordance with the sketch at the end of this section.

PART 2 PRODUCTS AND PART 3 EXECUTION (NOT APPLICABLE)



SIGN SHALL BE FABRICATED FROM .125 THICK 6061-T6 ALUMINUM PANEL
COLOR

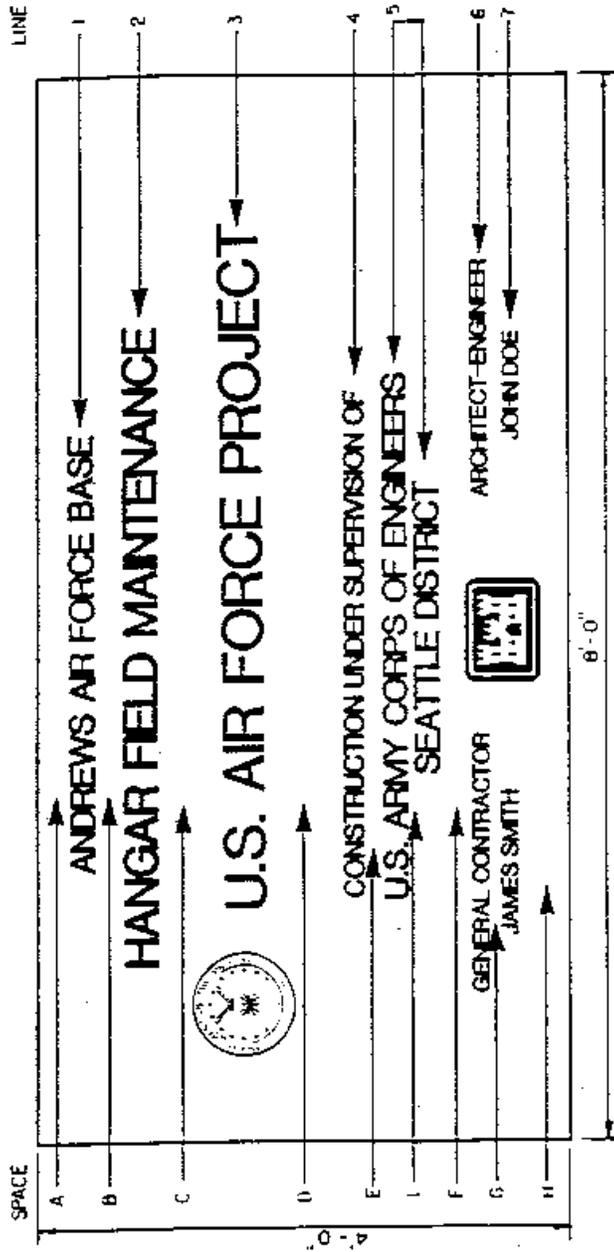
1. SAFETY RED (SR)
2. WHITE
3. WHITE
4. BLACK

LETTERING SHALL BE HELVETICA BOLD TYPOGRAPHY.

LETTERS AND BACKGROUND SHALL BE REFLECTIVE SHEETING MATERIAL.

SIGNS SHALL BE POSTED AT 6'-6" (BOTTOM SIGN TO GRADE) OR AS DIRECTED BY THE CONTRACTING OFFICER.

LETTERING TO BE CENTERED ON PANEL.



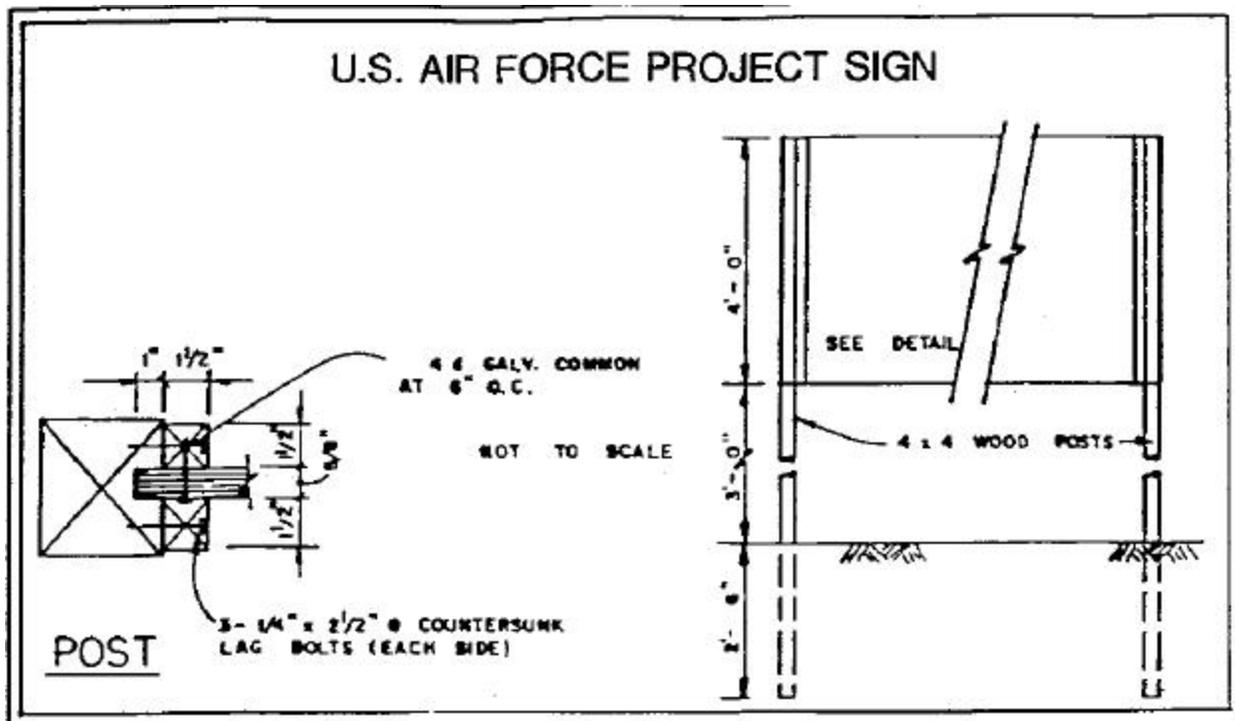
SAMPLE CONSTRUCTION SIGN FOR MCP PROJECTS

SCHEDULE

SPACE	HT.	LINE	DESCRIPTION	LETTER STROKE HT.
A	2"	1	LOCATION	2 3/8"
B	2 5/8"	2	PROJECT NOMENCLATURE *	1/4"
C	5 3/4"	3	U.S. AIR FORCE PROJECT	3/8"
D	6"	4	CONSTRUCTION UNDER SUPERVISION OF	1/2"
E	4"	5	CONSTRUCTION AGENCY *	1 1/2"
F	4"	6	GENERAL CONTRACTOR *	1/8"
G	1"	7	GENERAL CONTRACTOR	1/4"
H	2 7/8"	8	WILL VARY TO SUIT PROJECT REQUIREMENTS	3/16"
I	2"	9	SEATTLE DISTRICT	3/16"

U.S. AIR FORCE
 PROJECT
 CONSTRUCTION SIGN

Sheet 1 of 2
 U.S. Army Eng'r. Dist., Seattle, WA.
 Proj. No. 44-111-100-100-100
 Proj. No. 44-111-100-100-100
 Date: 20 JUNE 84
 GHI B.L.N. File No. 491/40-08-18



NOTES:

1. Signboard 4' x 8' x 5/8" grade A-C exterior type plywood with medium density overlay on both sides.
2. Paint both sides and edges with one prime coat and two coats of paint, accordance with FED. STD. 595b, color number brown 30118 exterior type enamel. Lettering shall be as shown on drawing and shall be antique linen 33578 gloss exterior type enamel.
3. Lettering shall be Helvetica medium.
4. Acceptable abbreviations may be used for Contractor's name.
5. Department of Air Force Seal and Corps of Engineers' Castle to be Government furnished.
6. No company logo shall be used.
7. Sign posts and 1 1/2" wood trim shall be stained dark brown.
8. Upon completion of work under this contract, the project sign shall be removed from the job site and shall remain the property of the Contractor.

SHEET 2 OF 2

END OF SECTION

SECTION 02300

EARTHWORK

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 2487	(1998) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 4318	(1998) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

1.2 DEFINITIONS

1.2.1 Satisfactory Materials

~~Satisfactory materials shall comprise any materials classified by ASTM D 2487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, GM-GC, SW, SP.~~ Satisfactory materials shall comprise any materials classified by ASTM D 2487 as GW, GP, GC, GP-GC, GM-GC, SW, SP & CL. Materials classified as SM, GM, GP-GM & GW-GM are satisfactory provided they contain water contents suitable for their

intended use. 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.

1.2.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Unsatisfactory materials also include man-made fills; trash; refuse; backfills from previous construction; and material classified as satisfactory which contains root and other organic matter or frozen material. The Contracting Officer shall be notified of any contaminated materials.

1.2.3 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. ~~Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic.~~ Materials classified as GM GP-GM, GW-GM, SW-SM, SP-SM and SM shall be identified as cohesionless only when the fines are nonplastic. Testing required for classifying materials shall be in accordance with ASTM D 4318, ASTM C 136, ASTM D 422, and ASTM D 1140.

1.2.4 Degree of Compaction

Degree of compaction required, except as noted in the second sentence, is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 abbreviated as a percent of laboratory maximum density. Since ASTM D 1557 applies only to soils that have 30 percent or less by weight of their particles retained on the 3/4 inch sieve, the degree of compaction for material having more than 30 percent by weight of their particles retained on the 3/4 inch sieve shall be expressed as a percentage of the maximum density in accordance with AASHTO T 180 Method D and corrected with AASHTO T 224. To maintain the same percentage of coarse material, the "remove and replace" procedure as described in the NOTE 8 in Paragraph 7.2 of AASHTO T 180 shall be used.

1.2.5 Competent Native Clay Materials

Native clay materials suitable for sub-grade and/or backfill shall be competent CL materials with moisture content at the time of compaction ranging from 1 percent below to 4 percent above optimum moisture content.

1.3 SUBMITTALS

SD-03 Product Data

Compaction Test Plan; G

Contractor is required to submit for approval a compaction testing plan. This submittal is required prior to the start of field activities. The lift and approximate location of each anticipated test should be depicted on the testing plan. The compaction testing results should be keyed to the plan and submitted to the government prior to the final inspection and BOD.

1.4 SUBSURFACE DATA

Subsurface soil boring logs are shown in the drawings. These data represent the best subsurface information available; however, variations may exist in the subsurface between boring locations.

1.5 CLASSIFICATION OF EXCAVATION

No consideration will be given to the nature of the materials, and all excavation will be designated as unclassified excavation.

1.6 BLASTING

Blasting will not be permitted.

1.7 UTILIZATION OF EXCAVATED MATERIALS

Unsatisfactory materials removed from excavations shall be disposed of in designated waste disposal or spoil areas. Satisfactory material removed from excavations shall be used, insofar as practicable, in the construction of fills, embankments, subgrades, shoulders, bedding (as backfill), and for similar purposes. No satisfactory excavated material shall be wasted without specific written authorization. Satisfactory material authorized to be wasted shall be disposed of in designated areas approved for surplus material storage or designated waste areas as directed. 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 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 other approved areas selected by the Contractor as specified.

3.1.1 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.

3.1.2 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.

3.2 OPENING AND DRAINAGE OF EXCAVATION

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, 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. The Contractor shall ensure that excavation of any area, or dumping of spoil material results in minimum detrimental effects on natural environmental conditions.

3.3 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.

3.4 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 02630a STORM-DRAINAGE SYSTEM; and Section 02316a 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.

3.5 PREPARATION OF GROUND SURFACE FOR EMBANKMENTS

3.5.1 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.

3.5.2 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 recompact 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.

3.6 EMBANKMENTS

3.6.1 Earth Embankments

Earth embankments shall be constructed from satisfactory materials free of organic or frozen material and rocks with any dimension greater than 3 inches. The material shall be placed in successive horizontal layers of loose material not more than 8 inches in depth. Each layer shall be spread uniformly on a soil surface that has been moistened or aerated as necessary, and scarified or otherwise broken up so that the fill will bond with the surface on which it is placed. After spreading, each layer shall be plowed, disked, or otherwise broken up; moistened or aerated as necessary; thoroughly mixed; and compacted to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials. Compaction requirements for the upper portion of earth embankments forming subgrade for pavements shall be identical with those requirements specified in paragraph SUBGRADE PREPARATION. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.7 SUBGRADE PREPARATION

3.7.1 Construction

Subgrade shall be shaped to line, grade, and cross section, and compacted as specified. This operation shall include plowing, disking, and any moistening or aerating required to obtain specified compaction. Soft or otherwise unsatisfactory material shall be removed and replaced with satisfactory excavated material or other approved material as directed. Rock encountered in the cut section shall be excavated to a depth of 6 inches below finished grade for the subgrade. Low areas resulting from removal of unsatisfactory material or excavation of rock shall be brought up to required grade with satisfactory materials, and the entire subgrade shall be shaped to line, grade, and cross section and compacted as specified. The elevation of the finish subgrade shall not vary more than 0.05 foot from the established grade and cross section.

3.7.2 Compaction

Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. Except for paved areas, each layer of the embankment shall be compacted to at least 90 percent of laboratory maximum density.

3.7.2.1 Subgrade for Pavements

Expansive cohesive fill materials should be compacted to a minimum of 90 percent and a maximum of 95 percent of the maximum density, and with a moisture content of 3 to 6 percent wet of optimum, as determined by ASTM D 1557.

3.8 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.

3.9 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. 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.

3.9.1 Fill and Backfill Material Gradation

One test per 500 cubic yards stockpiled or in-place source material. Gradation of fill and backfill material shall be determined in accordance with ASTM C 136.

3.9.2 In-Place Densities

- a. One test per 930 square feet, or fraction thereof, of each lift of fill or backfill areas compacted by other than hand-operated machines.
- b. One test per 233 square feet, or fraction thereof, of each lift of fill or backfill areas compacted by hand-operated machines.

3.9.3 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.

3.9.4 Optimum Moisture and Laboratory Maximum Density

Tests shall be made for each type material or source of material to determine the optimum moisture and laboratory maximum density values. One representative test per 75 cubic yards of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.

3.9.5 Tolerance Tests for Subgrades

Continuous checks on the degree of finish specified in paragraph SUBGRADE PREPARATION shall be made during construction of the subgrades.

3.10 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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SECTION 02316

EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS

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 2487	(1998) Classification of Soils for Engineering Purposes (Unified Soil Classification System)

1.2 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.

1.3 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

Compaction Test Plan; G

Contractor is required to submit for approval a compaction testing plan. This submittal is required prior to the start of field activities. The lift and approximate location of each anticipated test should be depicted on the testing plan. The compaction testing results should be keyed to the plan and submitted to the government prior to the final inspection and BOD.

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.~~ Satisfactory materials shall comprise any materials classified by ASTM D 2487 as GW, GP, GC, GP-GC, GM-GC, SW, SP & CL. Materials classified as SM, GM, GP-GM & GW-GM are satisfactory provided they contain water contents suitable for their intended use.

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 3 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.~~ Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW & SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH 7 CH. Materials classified as GM, GP-GM, GW-GM, SW-SM, SP-SM & SM shall be identified as cohesionless only when the fines are nonplastic.

2.1.4 Unyielding Material

Unyielding material shall consist of rock and gravelly soils with stones greater than 3 inches in any dimension or as defined by the pipe manufacturer, whichever is smaller.

2.1.5 Unstable Material

Unstable material shall consist of materials too wet to properly support the utility pipe, conduit, or appurtenant structure.

2.1.6 Select Granular Material

Where unstable material is encountered in the bottom of the trench, such material shall be removed and replaced with select granular material. Select granular material shall be nonswelling and conform to the following gradation:

<u>U.S. Standard</u>	<u>Percent Passing Sieve Size</u>
3 inch	100
No. 4	20-40
No. 200	0-10

2.1.7 Competent Native Clay Materials

Native clay materials suitable for sub-grade and/or backfill shall be competent CL materials with moisture content at the time of compaction ranging from 1 percent below to 4 percent above optimum moisture content.

2.1.87 Initial Backfill Material

Initial backfill shall consist of select granular material or satisfactory materials free from rocks 1 inch 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 1 inch 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

Locator pegs (passive underground utilities) shall be of a type specifically manufactured for electronic marking of underground utilities. The transponder pegs have a polyethylene shell, detachable to a vertical distance of, and have an accuracy of plus. The frequency of the pegs shall be as below:
Locator Peg Frequency Requirements 169.8 KHz Electric 83 KHz Gas, Oil, Dangerous Materials 101.4 KHz Telephone, Telegraph, Television, Police and Fire communications 145.7KHz: Water Systems 122.5 KHz: Sanitary Sewer Systems Transponder pegs shall be manufactured by Communications Technology Corporation in Atlanta, Georgia, or equivalent.

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. 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 3 inches or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, shall be removed to avoid point bearing.

3.1.1.2 Removal of Unyielding Material

Where unyielding material is encountered in the bottom of the trench, such material shall be removed 4 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. 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 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 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 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

Granular bedding for utility pipes shall consist of material meeting the following gradation requirements: 100 percent by weight passing the 1-inch sieve; 40 percent to 80 percent by weight passing the No. 4 sieve; and 8 percent to 20 percent by weight passing the No. 200 sieve, or as

recommended by the utility pipe manufacturer. 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. Sidewalks, Turfed or Seeded Areas and Miscellaneous Areas: Backfill shall be deposited in layers of a maximum of 12 inch loose thickness, and compacted to 85 percent maximum density for cohesive soils and 90 percent maximum density for cohesionless soils. Compaction by water flooding or jetting will not be permitted. This requirement shall also apply to all other areas not specifically designated above.

3.2.2 Backfill for Appurtenances

After the manhole, catchbasin, inlet, or similar structure has been constructed and the concrete has been allowed to cure for 3 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 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 6 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 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.

3.3.4 Plastic Marking Tape

Warning tapes shall be installed directly above the pipe, at a depth of 18" 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. 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 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 02741

HOT-MIX ASPHALT (HMA) FOR ROADS

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 MP 1	(1998) Provisional Specification for Performance Graded Asphalt Binder
AASHTO MP 2	(1998; Interim 1999) Superpave Volumetric Mix Design
AASHTO TP53	(1998; Interim 1999) Determining Asphalt Content of Hot Mix Asphalt by the Ignition Method

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 29/C 29M	(1997) Bulk Density ("Unit Weight") and Voids in Aggregates
ASTM C 88	(1999a) Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C 117	(1995) Materials Finer than 75 micrometer (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 131	(1996) Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates
ASTM C 566	(1997) Evaporable Total Moisture Content of Aggregate by Drying
ASTM C 1252	(1998) Uncompacted Void Content of Fine Aggregate (as Influenced by Particle Shape, Surface Texture, and Grading)
ASTM D 140	(1998) Sampling Bituminous Materials
ASTM D 242	(1995) Mineral Filler for Bituminous Paving Mixtures

ASTM D 1461	(1985)) Moisture or Volatile Distillates in Bituminous Paving Mixtures
ASTM D 1559	(1989) Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus
ASTM D 2041	(1995) Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D 2172	(1995) Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
ASTM D 2419	(1995) Sand Equivalent Value of Soils and Fine Aggregate
ASTM D 2489	(1984; R 1994e1) Degree of Particle Coating of Bituminous-Aggregate Mixtures
ASTM D 2726	(1996e1) Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixture
ASTM D 2950	(1997) Density of Bituminous Concrete in Place by Nuclear Method
ASTM D 3381	(1999) Viscosity-Graded Asphalt Cement for Use in Pavement Construction
ASTM D 3665	(1999) Random Sampling of Construction Materials
ASTM D 3666	(1998) Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials
ASTM D 4125	(1994e1) Asphalt Content of Bituminous Mixtures by the Nuclear Method
ASTM D 4791	(1999) Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D 4867/D 4867M	(1996) Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D 5444	(1998) Mechanical Size Analysis of Extracted Aggregate
ASTM D 6307	(1998) Asphalt Content of Hot Mix Asphalt by Ignition Method
ASPHALT INSTITUTE (AI)	
AI MS-2	(1997) Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types
AI MS-22	(1998; 2nd Edition) Construction of Hot-Mix Asphalt Pavements

CALIFORNIA DEPARTMENT OF TRANSPORTATION (CDT)

CDT Test 526 (1978) Operation of California Profilograph and Evaluation of Profiles

CORPS OF ENGINEERS (COE)

COE CRD-C 171 (1995) Test Method for Determining Percentage of Crushed Particles in Aggregate

1.2 DESCRIPTION OF WORK

The work shall consist of pavement courses composed of mineral aggregate and asphalt material heated and mixed in a central mixing plant and placed on a prepared course. HMA designed and constructed in accordance with this section shall conform to the lines, grades, thicknesses, and typical cross sections shown on the drawings. Each course shall be constructed to the depth, section, or elevation required by the drawings and shall be rolled, finished, and approved before the placement of the next course.

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

Mix Design; G

Proposed JMF.

SD-06 Test Reports

Aggregates; G.

Aggregate and QC test results.

1.4 HAULING EQUIPMENT

Trucks used for hauling hot-mix asphalt shall have tight, clean, and smooth metal beds. To prevent the mixture from adhering to them, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other approved material. Petroleum based products shall not be used as a release agent. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers (tarps) shall be securely fastened.

1.5 ASPHALT PAVERS

Asphalt pavers shall be self-propelled, with an activated screed, heated as necessary, and shall be capable of spreading and finishing courses of hot-mix asphalt which will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface.

1.5.1 Receiving Hopper

The paver shall have a receiving hopper of sufficient capacity to permit a uniform spreading operation. The hopper shall be equipped with a distribution system to place the mixture uniformly in front of the screed without segregation. The screed shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture.

1.5.2 Automatic Grade Controls

If an automatic grade control device is used, the paver shall be equipped with a control system capable of automatically maintaining the specified screed elevation. The control system shall be automatically actuated from either a reference line and/or through a system of mechanical sensors or sensor-directed mechanisms or devices which will maintain the paver screed at a predetermined transverse slope and at the proper elevation to obtain the required surface. The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1 percent. A transverse slope controller shall not be used to control grade. The controls shall be capable of working in conjunction with any of the following attachments:

- a. Ski-type device of not less than 30 feet in length
- b. Taut string line set to grade.
- c. Short ski or shoe for joint matching.
- d. Laser control.

1.6 ROLLERS

Rollers shall be in good condition and shall be operated at slow speeds to avoid displacement of the asphalt mixture. The number, type, and weight of rollers shall be sufficient to compact the mixture to the required density while it is still in a workable condition. Equipment which causes excessive crushing of the aggregate shall not be used.

1.7 WEATHER LIMITATIONS

The hot-mix asphalt 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

<u>Mat Thickness, inches</u>	<u>Degrees F</u>
3 or greater	40
Less than 3	45

PART 2 PRODUCTS

2.1 AGGREGATES

Aggregates shall consist of crushed stone, crushed gravel, crushed slag, screenings, natural sand and mineral filler, as required. The portion of material retained on the No. 4 sieve is coarse aggregate. The portion of material passing the No. 4 sieve and retained on the No. 200 sieve is fine aggregate. The portion passing the No. 200 sieve is defined as mineral filler. All aggregate test results and samples shall be submitted to the Contracting Officer at least 14 days prior to start of construction.

2.1.1 Coarse Aggregate

Coarse aggregate shall consist of sound, tough, durable particles, free from films of material that would prevent thorough coating and bonding with the asphalt material and free from organic matter and other deleterious substances. All individual coarse aggregate sources shall meet the following requirements:

- a. The percentage of loss shall not be greater than 40 percent after 500 revolutions when tested in accordance with ASTM C 131.
- b. The percentage of loss shall not be greater than 18 percent after five cycles when tested in accordance with ASTM C 88 using magnesium sulfate.
- c. At least 75 percent by weight of coarse aggregate shall have at least two or more fractured faces when tested in accordance with COE CRD-C 171. Fractured faces shall be produced by crushing.
- d. The particle shape shall be essentially cubical and the aggregate shall not contain more than 20% percent, by weight, of flat and elongated particles (3:1 ratio of maximum to minimum) when tested in accordance with ASTM D 4791.
- e. Slag shall be air-cooled, blast furnace slag, and shall have a compacted weight of not less than 75 lb/cu ft when tested in accordance with ASTM C 29/C 29M.

2.1.2 Fine Aggregate

Fine aggregate shall consist of clean, sound, tough, durable particles. The aggregate particles shall be free from coatings of clay, silt, or any objectionable material and shall contain no clay balls. All individual fine aggregate sources shall have a sand equivalent value not less than 45 when tested in accordance with ASTM D 2419.

The fine aggregate portion of the blended aggregate shall have an uncompacted void content not less than 43.0 percent when tested in accordance with ASTM C 1252 Method A.

2.1.3 Mineral Filler

Mineral filler shall be nonplastic material meeting the requirements of ASTM D 242.

2.1.4 Aggregate Gradation

The combined aggregate gradation shall conform to gradations specified in Table 2, when tested in accordance with ASTM C 136 and ASTM C 117, and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve or vice versa, but grade uniformly from coarse to fine.

Table 2. Aggregate Gradations

<u>Sieve Size, inch</u>	<u>Gradation 1 Percent Passing by Mass</u>	<u>Gradation 2 Percent Passing by Mass</u>	<u>Gradation 3 Percent Passing by Mass</u>	<u>Percent Passing by Mass</u>
1	100	---	---	---
3/4	76-96	100	---	---
1/2	68-88	76-96	100	100
3/8	60-82	69-89	76-96	76-96
No. 4	45-67	53-73	58-78	58-78
No. 8	32-54	38-60	40-60	40-60
No. 16	22-44	26-48	28-48	28-48
No. 30	15-35	18-38	-38	-38
No. 50	9-25	11-27	11-27	11-27
No. 100	6-18	6-18	6-18	6-18
No. 200	3-6	3-6	3-6	3-6

2.2 ASPHALT CEMENT BINDER

Asphalt cement binder shall conform to ASTM D 3381 Table 2, Viscosity Grade AC-10 or AASHTO MP 1 Performance Grade (PG) 58-22. Test data indicating grade certification shall be provided by the supplier at the time of delivery of each load to the mix plant. Copies of these certifications shall be submitted to the Contracting Officer. The supplier is defined as the last source of any modification to the binder. The Contracting Officer may sample and test the binder at the mix plant at any time before or during mix production. Samples for this verification testing shall be obtained by the Contractor in accordance with ASTM D 140 and in the presence of the Contracting Officer. These samples shall be furnished to the Contracting Officer for the verification testing, which shall be at no cost to the Contractor. Samples of the asphalt cement specified shall be submitted for approval not less than 14 days before start of the test section.

2.3 MIX DESIGN

The Contractor shall develop the mix design. The asphalt mix shall be composed of a mixture of well-graded aggregate, mineral filler if required, and asphalt material. The aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF). No hot-mix asphalt for payment shall be produced until a JMF has been approved. The hot-mix asphalt shall be designed using procedures contained in AI MS-2 and the criteria shown in Table 3. If the Tensile Strength Ratio (TSR) of the composite mixture, as determined by ASTM D 4867/D 4867M is less than 75, the aggregates shall be rejected or the asphalt mixture treated with an approved anti-stripping agent. The amount of anti-

stripping agent added shall be sufficient to produce a TSR of not less than 75. If an anti-strip agent is required, it shall be provided by the Contractor at no additional cost. Sufficient materials to produce 200 pound of blended mixture shall be provided to the Contracting Officer for verification of mix design at least 14 days prior to construction of test section.

At the option of the contractor a currently used DOT super pave hot mix may be used in lieu of developing a new hot mix design study as described herein. The super pave volumetric mix shall be designed in accordance with AASHTO MP 2.

2.3.1 JMF Requirements

The job mix formula shall be submitted in writing by the Contractor for approval at least 14 days prior to the start of the test section and shall include as a minimum:

- a. Percent passing each sieve size.
- b. Percent of asphalt cement.
- c. Percent of each aggregate and mineral filler to be used
- d. Asphalt viscosity grade, penetration grade, or performance grade.
- e. Number of blows of hammer per side of molded specimen.
- f. Laboratory mixing temperature.
- g. Lab compaction temperature
- h. Temperature-viscosity relationship of the asphalt cement.
- i. Plot of the combined gradation on the 0.45 power gradation chart, stating the nominal maximum size.
- j. Graphical plots of stability, flow, air voids, voids in the mineral aggregate, and unit weight versus asphalt content as shown in AI MS-2.
- k. Specific gravity and absorption of each aggregate
- l. Percent natural sand.
- m. Percent particles with 2 or more fractured faces (in coarse aggregate).
- n. Fine aggregate angularity.
- o. Percent flat or elongated particles (in coarse aggregate).
- p. Tensile Strength Ratio(TSR).
- q. Antistrip agent (if required) and amount.
- r. List of all modifiers and amount.

- s. Percentage and properties (asphalt content, binder properties, and aggregate properties) of reclaimed asphalt pavement (RAP) in accordance with paragraph RECYCLED HOT-MIX ASPHALT, if RAP is used.

Table 3. Marshall Design Criteria

<u>Test Property</u>	<u>75 Blow Mix</u>	<u>50 Blow Mix</u>
Stability, pounds minimum	*1800	*1000
Flow, 0.01 inch	8-16	8-18
Air voids, percent	3-5	3-5
Percent Voids in mineral aggregate VMA, (minimum)		
Gradation 1	13.0	13.0
Gradation 2	14.0	14.0
Gradation 3	15.0	15.0
TSR, minimum percent	75	75

* This is a minimum requirement. The average during construction shall be significantly higher than this number to ensure compliance with the specifications.

** Calculate VMA in accordance with AI MS-2, based on ASTM D 2726 bulk specific gravity for the aggregate.

2.3.2 Adjustments to Field JMF

The Laboratory JMF for each mixture shall be in effect until a new formula is approved in writing by the Contracting Officer. Should a change in sources of any materials be made, a new laboratory jmf design shall be performed and a new JMF approved before the new material is used. The Contractor will be allowed to adjust the Laboratory JMF within the limits specified below to optimize mix volumetric properties with the approval of the Contracting Officer. Adjustments to the Laboratory JMF shall be applied to the field (plant) established JMF and limited to those values as shown. Adjustments shall be targeted to produce or nearly produce 4 percent voids total mix (VTM).

TABLE 4. Field (Plant) Established JMF Tolerances

Sieves	Adjustments (plus or minus), percent
No. 4	3
No. 8	3
No. 200	1
Binder Content	0.40

If adjustments are needed that exceed these limits, a new mix design shall be developed. Tolerances given above may permit the aggregate grading to be outside the limits shown in Table 2; while not desirable, this is acceptable.

2.4 RECYCLED HOT MIX ASPHALT

Recycled HMA shall consist of reclaimed asphalt pavement (RAP), coarse aggregate, fine aggregate, mineral filler, and asphalt cement. The RAP shall be of a consistent gradation and asphalt content and properties. When RAP is fed into the plant, the maximum RAP chunk size shall not exceed 2 inches. The recycled HMA mix shall be designed using procedures contained in AI MS-2 and AI MS-22. The job mix shall meet the requirements of paragraph MIX DESIGN. The amount of RAP shall not exceed 30 percent.

2.4.1 RAP Aggregates and Asphalt Cement

The blend of aggregates used in the recycled mix shall meet the requirements of paragraph AGGREGATES. The percentage of asphalt in the RAP shall be established for the mixture design according to ASTM D 2172 using the appropriate dust correction procedure.

2.4.2 RAP Mix

The blend of new asphalt cement and the RAP asphalt binder shall meet the viscosity or dynamic shear rheometer at high temperature and bending beam at low temperature requirements in paragraph ASPHALT CEMENT BINDER. The virgin asphalt cement shall not be more than two standard asphalt material grades different than that specified in paragraph ASPHALT CEMENT BINDER.

PART 3 EXECUTION

3.1 PREPARATION OF ASPHALT BINDER MATERIAL

The asphalt cement material shall be heated avoiding local overheating and providing a continuous supply of the asphalt material to the mixer at a uniform temperature. The temperature of unmodified asphalts shall be no more than 325 degrees F when added to the aggregates. Modified asphalts shall be no more than 350 degrees F when added to the aggregates.

3.2 PREPARATION OF MINERAL AGGREGATE

The aggregate for the mixture shall be heated and dried prior to mixing. No damage shall occur to the aggregates due to the maximum temperature and rate of heating used. The temperature of the aggregate and mineral filler shall not exceed 350 degrees F when the asphalt cement is added. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

3.3 PREPARATION OF HOT-MIX ASPHALT MIXTURE

The aggregates and the asphalt cement shall be weighed or metered and introduced into the mixer in the amount specified by the JMF. The combined materials shall be mixed until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but no less than 25 seconds for batch plants. The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in ASTM D 2489, for each

individual plant and for each type of aggregate used. The wet mixing time will be set to at least achieve 95 percent of coated particles. The moisture content of all hot-mix asphalt upon discharge from the plant shall not exceed 0.5 percent by total weight of mixture as measured by ASTM D 1461.

3.4 PREPARATION OF THE UNDERLYING SURFACE

Immediately before placing the hot mix asphalt, the underlying course shall be cleaned of dust and debris. A prime coat and/or tack coat shall be applied in accordance with the contract specifications.

3.5 TEST SECTION

Prior to full production, the Contractor shall place a test section for each JMF used. The contractor shall construct a test section 250 - 500 feet long and two-paver passes wide placed for two lanes, with a longitudinal cold joint. The test section shall be of the same depth as the course, which it represents. The underlying grade or pavement structure upon which the test section is to be constructed shall be the same as the remainder of the course represented by the test section. The equipment and personnel used in construction of the test section shall be the same equipment to be used on the remainder of the course represented by the test section. The test section shall be placed as part of the project pavement as approved by the Contracting Officer.

3.5.1 Sampling and Testing for Test Section

One random sample shall be taken at the plant, triplicate specimens compacted, and tested for stability, flow, and laboratory air voids. A portion of the same sample shall be tested for aggregate gradation and asphalt content. Four randomly selected cores shall be taken from the finished pavement mat, and four from the longitudinal joint, and tested for density. Random sampling shall be in accordance with procedures contained in ASTM D 3665. The test results shall be within the tolerances shown in Table 5 for work to continue. If all test results meet the specified requirements, the test section shall remain as part of the project pavement. If test results exceed the tolerances shown, the test section shall be removed and replaced at no cost to the Government and another test section shall be constructed. The test section shall be paid for with the first lot of paving

Table 5. Test Section Requirements for Material and Mixture Properties

<u>Property</u>	<u>Specification Limit</u>
Aggregate Gradation-Percent Passing (Individual Test Result)	
No. 4 and larger	JMF plus or minus 8
No. 8, No. 16, No. 30, and No. 50	JMF plus or minus 6
No. 100 and No. 200	JMF plus or minus 2.0
Asphalt Content, Percent (Individual Test Result)	JMF plus or minus 0.5
Laboratory Air Voids, Percent (Average of 3 specimens)	JMF plus or minus 1.0

VMA, Percent (Average of 3 specimens)	13 minimum
Stability, pounds (Average of 3 specimens)	1000 minimum
Flow, 0.01 inches (Average of 3 specimens)	8 - 18
Mat Density, Percent of Marshall (Average of 4 Random Cores)	97.0 - 100.5
Joint Density, Percent of Marshall (Average of 4 Random Cores)	95.5 - 100.5

3.5.2 Additional Test Sections

If the initial test section should prove to be unacceptable, the necessary adjustments to the JMF, plant operation, placing procedures, and/or rolling procedures shall be made. A second test section shall then be placed. Additional test sections, as required, shall be constructed and evaluated for conformance to the specifications. Full production shall not begin until an acceptable section has been constructed and accepted.

3.6 TESTING LABORATORY

The laboratory used to develop the JMF shall meet the requirements of ASTM D 3666. A certification signed by the manager of the laboratory stating that it meets these requirements or clearly listing all deficiencies shall be submitted to the Contracting Officer prior to the start of construction. The certification shall contain as a minimum:

- a. Qualifications of personnel; laboratory manager, supervising technician, and testing technicians
- b. A listing of equipment to be used in developing the job mix
- c. A copy of the laboratory's quality control system.
- d. Evidence of participation in the AASHTO Materials Reference Laboratory (AMRL) program.

3.7 TRANSPORTING AND PLACING

3.7.1 Transporting

The hot-mix asphalt shall be transported from the mixing plant to the site in clean, tight vehicles. Deliveries shall be scheduled so that placing and compacting of mixture is uniform with minimum stopping and starting of the paver. Adequate artificial lighting shall be provided for night placements. Hauling over freshly placed material will not be permitted until the material has been compacted as specified, and allowed to cool to 140 degrees F. To deliver mix to the paver, the Contractor shall use a material transfer vehicle, which shall be operated to produce continuous forward motion of the paver.

3.7.2 Placing

The mix shall be placed and compacted at a temperature suitable for obtaining density, surface smoothness, and other specified requirements. Upon arrival, the mixture shall be placed to the full width by an asphalt paver; it shall be struck off in a uniform layer of such depth that, when the work is

completed, it shall have the required thickness and conform to the grade and contour indicated. The speed of the paver shall be regulated to eliminate pulling and tearing of the asphalt mat. Unless otherwise permitted, placement of the mixture shall begin along the centerline of a crowned section or on the high side of areas with a one-way slope. The mixture shall be placed in consecutive adjacent strips having a minimum width of 10 feet. The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least 1 foot; however, the joint in the surface course shall be at the centerline of the pavement. Transverse joints in one course shall be offset by at least 10 feet from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a minimum of 10 feet. On isolated areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be spread and luted by hand tools.

3.8 COMPACTION OF MIXTURE

After placing, the mixture shall be thoroughly and uniformly compacted by rolling. The surface shall be compacted as soon as possible without causing displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any displacement occurring as a result of reversing the direction of the roller, or from any other cause, shall be corrected at once. Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until the surface is of uniform texture, true to grade and cross section, and the required field density is obtained. To prevent adhesion of the mixture to the roller, the wheels shall be kept properly moistened but excessive water will not be permitted. In areas not accessible to the roller, the mixture shall be thoroughly compacted with hand tampers. Any mixture that becomes loose and broken, mixed with dirt, contains check-cracking, or is in any way defective shall be removed full depth, replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching will not be allowed.

3.9 JOINTS

The formation of joints shall be made ensuring a continuous bond between the courses and to obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade.

3.9.1 Transverse Joints

The roller shall not pass over the unprotected end of the freshly laid mixture, except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing material at the joint. The cutback material shall be removed from the project. In both methods, all contact surfaces shall be given a light tack coat of asphalt material before placing any fresh mixture against the joint.

3.9.2 Longitudinal Joints

Longitudinal joints which are irregular, damaged, uncompacted, cold (less than 175 degrees F at the time of placing adjacent lanes), or otherwise defective, shall be cut back a minimum of 2 inches from the edge with a cutting wheel to expose a clean, sound vertical surface for the full depth of the course. All cutback material shall be removed from the project. All contact surfaces shall be given a light tack coat of asphalt material prior to placing any fresh mixture against the joint. The Contractor will be

allowed to use an alternate method if it can be demonstrated that density, smoothness, and texture can be met.

3.10 CONTRACTOR QUALITY CONTROL

3.10.1 General Quality Control Requirements

The Contractor shall develop an approved Quality Control Plan. Hot-mix asphalt for payment shall not be produced until the quality control plan has been approved. The plan shall address all elements, which affect the quality of the pavement including, but not limited to:

- a. Mix Design
- b. Aggregate Grading
- c. Quality of Materials
- d. Stockpile Management
- e. Proportioning
- f. Mixing and Transportation
- g. Mixture Volumetrics
- h. Moisture Content of Mixtures
- i. Placing and Finishing
- j. Joints
- k. Compaction
- l. Surface Smoothness

3.10.2 Testing Laboratory

The Contractor shall provide a fully equipped asphalt laboratory located at the plant or job site. The laboratory shall meet the requirements as required in ASTM D 3666. The effective working area of the laboratory shall be a minimum of 150 square feet with a ceiling height of not less than 7.5 feet. Lighting shall be adequate to illuminate all working areas. It shall be equipped with heating and air conditioning units to maintain a temperature of 75 degrees F plus or minus 5 degrees F. Laboratory facilities shall be kept clean and all equipment shall be maintained in proper working condition. The Contracting Officer shall be permitted unrestricted access to inspect the Contractor's laboratory facility, to witness quality control activities, and to perform any check testing desired. The Contracting Officer will advise the Contractor in writing of any noted deficiencies concerning the laboratory facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to adversely affect test results, the incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are corrected.

3.10.3 Quality Control Testing

The Contractor shall perform all quality control tests applicable to these specifications and as set forth in the Quality Control Program. The testing program shall include, but shall not be limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, moisture in the asphalt mixture, laboratory air voids, stability, flow, in-place density, grade and smoothness. A Quality Control Testing Plan shall be developed as part of the Quality Control Program.

3.10.3.1 Asphalt Content

A minimum of two tests to determine asphalt content will be performed per lot (a lot is defined in paragraph MATERIAL ACCEPTANCE AND PERCENT PAYMENT) by one of the following methods: the extraction method in accordance with ASTM D 2172, Method A or B, the ignition method in accordance with the AASHTO TP53 or ASTM D 6307, or the nuclear method in accordance with ASTM D 4125, provided the nuclear gauge is calibrated for the specific mix being used. For the extraction method, the weight of ash, as described in ASTM D 2172, shall be determined as part of the first extraction test performed at the beginning of plant production; and as part of every tenth extraction test performed thereafter, for the duration of plant production. The last weight of ash value obtained shall be used in the calculation of the asphalt content for the mixture.

3.10.3.2 Gradation

Aggregate gradations shall be determined a minimum of twice per lot from mechanical analysis of recovered aggregate in accordance with ASTM D 5444. When asphalt content is determined by the nuclear method, aggregate gradation shall be determined from hot bin samples on batch plants, or from the cold feed on drum mix plants. For batch plants, aggregates shall be tested in accordance with ASTM C 136 using actual batch weights to determine the combined aggregate gradation of the mixture.

3.10.3.3 Temperatures

Temperatures shall be checked at least four times per lot, at necessary locations, to determine the temperature at the dryer, the asphalt cement in the storage tank, the asphalt mixture at the plant, and the asphalt mixture at the job site.

3.10.3.4 Aggregate Moisture

The moisture content of aggregate used for production shall be determined a minimum of once per lot in accordance with ASTM C 566.

3.10.3.5 Moisture Content of Mixture

The moisture content of the mixture shall be determined at least once per lot in accordance with ASTM D 1461 or an approved alternate procedure.

3.10.3.6 Laboratory Air Voids, Marshall Stability and Flow

Mixture samples shall be taken at least four times per lot and compacted into specimens, using 50 blows per side with the Marshall hammer as described in ASTM D 1559. After compaction, the laboratory air voids of each specimen shall be determined, as well as the Marshall stability and flow.

3.10.3.7 In-Place Density

The Contractor shall conduct any necessary testing to ensure the specified density is achieved. A nuclear gauge may be used to monitor pavement density in accordance with ASTM D 2950.

3.10.3.8 Additional Testing

Any additional testing, which the Contractor deems necessary to control the process, may be performed at the Contractor's option.

3.10.3.9 QC Monitoring

The Contractor shall submit all QC test results to the Contracting Officer on a daily basis as the tests are performed. The Contracting Officer reserves the right to monitor any of the Contractor's quality control testing and to perform duplicate testing as a check to the Contractor's quality control testing.

3.10.4 Sampling

When directed by the Contracting Officer, the Contractor shall sample and test any material which appears inconsistent with similar material being produced, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling shall be in accordance with standard procedures specified.

3.10.5 Control Charts

For process control, the Contractor shall establish and maintain linear control charts on both individual samples and the running average of last four samples for the parameters listed in Table 6, as a minimum. These control charts shall be posted as directed by the Contracting Officer and shall be kept current at all times. The control charts shall identify the project number, the test parameter being plotted, the individual sample numbers, the Action and Suspension Limits listed in Table 6 applicable to the test parameter being plotted, and the Contractor's test results. Target values from the JMF shall also be shown on the control charts as indicators of central tendency for the cumulative percent passing, asphalt content, and laboratory air voids parameters. When the test results exceed either applicable Action Limit, the Contractor shall take immediate steps to bring the process back in control. When the test results exceed either applicable Suspension Limit, the Contractor shall halt production until the problem is solved. The Contractor shall use the control charts as part of the process control system for identifying trends so potential problems can be corrected before they occur. Decisions concerning mix modifications shall be made based on analysis of the results provided in the control charts. The Quality Control Plan shall indicate the appropriate action, which shall be taken to bring the process into control when certain parameters exceed their Action Limits.

Table 6. Action and Suspension Limits for the Parameters to be Plotted on Individual and Running Average Control Charts

<u>Parameter to be Plotted</u>	<u>Running Average of Individual Samples</u>		<u>Last Four Samples</u>	
	<u>Action Limit</u>	<u>Suspension Limit</u>	<u>Action Limit</u>	<u>Suspension Limit</u>
No. 4 sieve, Cumulative % Passing, deviation from JMF target; plus or minus values	6	8	4	5
No. 30 sieve, Cumulative % Passing, deviation from JMF target; plus or minus values	4	6	3	4
No. 200 sieve, Cumulative % Passing, deviation from JMF target; plus or minus values	1.4	2.0	1.1	1.5
Stability, pounds (minimum)				
75 Blow JMF	1800	1700	1900	1800
50 Blow JMF	1000	900	1100	1000
Flow, 0.01 inches				
75 Blow	8 min. 16 max.	7 min. 17 max.	9 min. 15 max.	8 min. 16 max.
50 Blow	8 min. 18 max.	7 min. 19 max.	9 min. 17 max.	8 min. 18 max.
Asphalt content, % deviation from JMF target; plus or minus value	0.4	0.5	0.2	0.3
Laboratory Air Voids, % deviation from JMF target value	No specific action and suspension limits set since this parameter is used to determine percent payment			
In-place Mat Density, % of Marshall density	No specific action and suspension limits set since this parameter is used to determine percent payment			
In-place Joint Density, % of Marshall density	No specific action and suspension limits set since this parameter is used to determine percent payment			

3.11 MATERIAL ACCEPTANCE AND PERCENT PAYMENT

An independent laboratory, hired by the Contractor, will perform testing for acceptability of work. Test results and payment calculations shall be forwarded daily to the Contracting Officer. Acceptance of the plant produced mix and in-place requirements will be on a lot to lot basis. A standard lot for all requirements will be equal to 2000 tons. Where appropriate, adjustment in payment for individual lots of hot-mix asphalt will be made based on in-place density, laboratory air voids, grade and smoothness in accordance with the following paragraphs. Grade and surface smoothness determinations will be made on the lot as a whole. Exceptions or adjustments to this will be made in situations where the mix within one lot is placed as part of both the intermediate and surface courses, thus grade and smoothness measurements for the entire lot cannot be made. In order to evaluate laboratory air voids and in-place (field) density, each lot will be divided into four equal sublots.

3.11.1 Sublot Sampling

One random mixture sample for determining laboratory air voids, theoretical maximum density, and for any additional testing the Contracting Officer desires, will be taken from a loaded truck delivering mixture to each sublot, or other appropriate location for each sublot. All samples will be selected randomly, using commonly recognized methods of assuring randomness conforming to ASTM D 3665 and employing tables of random numbers or computer programs. Laboratory air voids will be determined from three laboratory compacted specimens of each sublot sample in accordance with ASTM D 1559. The specimens will be compacted within 2 hours of the time the mixture was loaded into trucks at the asphalt plant. Samples will not be reheated prior to compaction and insulated containers will be used as necessary to maintain the temperature.

3.11.2 Additional Sampling and Testing

The Contracting Officer reserves the right to direct additional samples and tests for any area which appears to deviate from the specification requirements. The Government will pay for the cost of any additional testing. Testing in these areas will be in addition to the lot testing, and the requirements for these areas will be the same as those for a lot.

3.11.3 Laboratory Air Voids

Laboratory air voids will be calculated by determining the Marshall density of each lab compacted specimen using ASTM D 2726 and determining the theoretical maximum density of every other sublot sample using ASTM D 2041. Laboratory air void calculations for each sublot will use the latest theoretical maximum density values obtained, either for that sublot or the previous sublot. The mean absolute deviation of the four laboratory air void contents (one from each sublot) from the JMF air void content will be evaluated and a pay factor determined from Table 7. All laboratory air void tests will be completed and reported within 24 hours after completion of construction of each lot.

3.11.4 In-place Density

3.11.4.1 General Density Requirements

For determining in-place density, one random core will be taken by the Government from the mat (interior of the lane) of each sublot, and one random core will be taken from the joint (immediately over joint) of each sublot. Each random core will be full thickness of the layer being placed. When the random core is less than 1 inch thick, it will not be included in the analysis. In this case, another

random core will be taken. After air drying to a constant weight, cores obtained from the mat and from the joints will be used for in-place density determination.

3.11.5 Grade

The final wearing surface of pavement shall conform to the elevations and cross sections shown and shall vary not more than 0.05 foot from the plan grade established and approved at site of work. Finished surfaces at juncture with other pavements shall coincide with finished surfaces of abutting pavements. Deviation from the plan elevation will not be permitted in areas of pavements where closer conformance with planned elevation is required for the proper functioning of drainage and other appurtenant structures involved. The final wearing surface of the pavement will be tested for conformance with specified plan grade requirements. The grade will be determined by running lines of levels at intervals of 25 feet, or less, longitudinally and transversely, to determine the elevation of the completed pavement surface. Within 5 working days, after the completion of a particular lot incorporating the final wearing surface, the Contracting Officer will inform the Contractor in writing, of the results of the grade-conformance tests. When more than 5 percent of all measurements made within a lot are outside the 0.05-foot tolerance, the pay factor based on grade for that lot will be 95 percent. In areas where the grade exceeds the tolerance by more than 50 percent, the Contractor shall remove the surface lift full depth; the Contractor shall then replace the lift with hot-mix asphalt to meet specification requirements, at no additional cost to the Government. Diamond grinding may be used to remove high spots to meet grade requirements. Skin patching for correcting low areas or planing or milling for correcting high areas will not be permitted.

3.11.6 Surface Smoothness

~~The Contractor shall use one of the following methods to test and evaluate surface smoothness of the pavement.~~ All testing shall be performed in the presence of the Contracting Officer. Detailed notes of the results of the testing shall be kept and a copy furnished to the Government immediately after each day's testing. ~~The profilograph method shall be used for all longitudinal and transverse testing, except where the runs would be less than 200 feet in length and the ends where the straightedge shall be used.~~ Where drawings show required deviations from a plane surface (crowns, drainage inlets, etc.), the surface shall be finished to meet the approval of the Contracting Officer.

3.11.6.1 Smoothness Requirements

a. Straightedge Testing: The finished surfaces of the pavements shall have no abrupt change of 1/4 inch or more, and all pavements shall be within the tolerances specified in Table 9 when checked with an approved 12 foot straightedge.

Table 9. Straightedge Surface Smoothness--Pavements

Pavement Category -----	Direction of Testing -----	Tolerance, inches -----
All paved areas	Longitudinal	1/4
	Transverse	1/4

~~—b. Profilograph Testing: The finished surfaces of the pavements shall have no abrupt change of 1/8 inch or more, and all pavement shall have a Profile Index not greater than specified in Table 10 when tested with an approved California type profilograph. If the extent of the pavement in either direction is less than 200 feet, that direction shall be tested by the straightedge method and shall meet requirements specified above.~~

~~Table 10. Profilograph Surface Smoothness Pavements~~

Pavement Category	Direction of Testing	Maximum Specified Profile Index (inch/mile)
All Paved Areas	Longitudinal	9

3.11.6.2 Testing Method

After the final rolling, but not later than 24 hours after placement, the surface of the pavement in each entire lot shall be tested by the Contractor in such a manner as to reveal all surface irregularities exceeding the tolerances specified above. Separate testing of individual sublots is not required. If any pavement areas are ground, these areas shall be retested immediately after grinding. The entire area of the pavement shall be tested in both a longitudinal and a transverse direction on parallel lines. The transverse lines shall be 25 feet or less apart, as directed. The longitudinal lines shall be at the centerline of each paving lane for lines less than 20 feet and at the third points for lanes 20 feet or greater. Other areas having obvious deviations shall also be tested. Longitudinal testing lines shall be continuous across all joints.

- a. Straightedge Testing. The straightedge shall be held in contact with the surface and moved ahead one-half the length of the straightedge for each successive measurement. The amount of surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between these two high points.
- b. Profilograph Testing. Profilograph testing shall be performed using approved equipment and procedures described in CDT Test 526. The equipment shall utilize electronic recording and automatic computerized reduction of data to indicate "must-grind" bumps and the Profile Index for the pavement. The "blanking band" shall be 0.2 inches wide and the "bump template" shall span 1 inch with an offset of 0.4 inch. The profilograph shall be operated by an approved, factory-trained operator on the alignments specified above. A copy of the reduced tapes shall be furnished the Government at the end of each day's testing.

END OF SECTION

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SECTION 07210
BUILDING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Concealed building insulation.
 - 2. Exposed building insulation.
 - 3. Loose-fill building insulation.
 - 4. Air retarders.
 - 5. Vapor retarders.
 - 6. Moisture barrier.
- B. Related Sections include the following:
 - 1. Division 6 Section "Rough Carpentry" for foam-plastic board sheathing over wood framing.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for insulation products.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of building insulation through one source.
- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface-Burning Characteristics: ASTM E 84.
 - 2. Fire-Resistance Ratings: ASTM E 119.
 - 3. Combustion Characteristics: ASTM E 136.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect plastic insulation as follows:
 - 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
 - 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATING MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.
 - 1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thicknesses, widths, and lengths.
- B. Extruded-Polystyrene Board Insulation: ASTM C 578, of type and density indicated below, with maximum flame-spread and smoke-developed indices of 75 and 450, respectively:
 - 1. Type IV, 1.60 lb/cu. ft., at crawlspace walls.
 - 2. Type and density as recommended by the steel siding manufacturer.
- C. Unfaced Mineral-Fiber Blanket Insulation for thermal or acoustical requirements: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
- D. Faced Mineral-Fiber Blanket Insulation: ASTM C 665, Type III (blankets with reflective membrane facing), Class A (membrane-faced surface with a flame spread of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil-scrim-kraft, foil-scrim, or foil-scrim-polyethylene vapor-retarder membrane on one face; consisting of fibers manufactured from glass, slag wool, or rock wool.
- E. Cellulosic-Fiber Loose-Fill Insulation: ASTM C 739, chemically treated for flame-resistance, processing, and handling characteristics.

2.2 AIR RETARDERS (BUILDING WRAP)

- A. Polymer-Based Building Wrap: ASTM E 1677, Type I air retarder; with flame spread and smoke developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; and UV stabilized.
 - 1. Thickness: Not less than 3 mils.

2. Permeance: Not less than 10 perms.
3. Flame-Spread Index: 25 or less per ASTM E 84.
4. Allowable Exposure Time: Not more than three months.

- B. Building Wrap Tape: Pressure-sensitive plastic tape recommended by building wrap manufacturer for sealing joints and penetrations in building wrap.

2.3 VAPOR RETARDERS

- A. Polyethylene Vapor Retarder: ASTM D 4397, 6 mils thick, with maximum permeance rating of 0.13 perm, for use at walls ~~and ceilings~~, and slabs on grade, and as indicated on the drawings. 10 mils thick, with maximum permeance rating of 0.076 perm, for use at crawlspace.
- B. Reinforced-Polyethylene Vapor Retarders: 2 outer layers of polyethylene film laminated to an inner reinforcing layer consisting of either nylon cord or polyester scrim and weighing not less than 25 lb/1000 sq. ft. , with maximum permeance rating of 0.0507 perm .
- C. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.4 MOISTURE BARRIER

- A. Moisture Barrier: 20 mils thick high-density polyethylene for use below low permeable non-swelling material under buildings and at building perimeters.
- B. Moisture-Barrier Tape: Pressure-sensitive tape of type recommended by moisture-barrier manufacturer for sealing joints and penetrations in moisture barrier.

2.5 AUXILIARY INSULATING MATERIALS

- A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.
- B. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.

2.6 INSULATION FASTENERS

- A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of thickness indicated securely in position indicated with self-locking washer in place; and complying with the following requirements:
1. Plate: Perforated galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 2. Spindle: Copper-coated, low carbon steel, fully annealed, 0.105 inch in diameter, length to suit depth of insulation indicated.
- B. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick galvanized steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.

1. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in the following locations:
 - a. Crawlspace.
 - b. Attic spaces.
- C. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for Sections in which substrates and related work are specified and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.

3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice and snow.
- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Water-Piping Coordination: If water piping is located on inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
- E. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

3.4 INSTALLATION OF GENERAL BUILDING INSULATION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Seal joints between closed-cell (nonbreathing) insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in

- completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.
- C. Set vapor-retarder-faced units with vapor retarder to warm side of construction, unless otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.
 - 1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
 - D. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:
 - 1. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
 - 2. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - E. For wood-framed construction, install mineral-fiber blankets according to ASTM C 1320 and as follows:
 - 1. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to produce airtight installation after concealing finish material is in place.
 - F. Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:
 - 1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.
 - 2. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.
 - 3. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.
 - G. Install board insulation at exterior wood-framed walls per insulation manufacturer's written instructions and steel siding manufacturer's recommendations.
 - H. Place loose-fill insulation into spaces and onto surfaces as shown, either by pouring or by machine blowing to comply with ASTM C 1015. Level horizontal applications to uniform thickness as indicated, lightly settle to uniform density, but do not compact excessively.
 - 1. For cellulosic loose-fill insulation, comply with the Cellulose Insulation Manufacturers Association's Special Report #3, "Standard Practice for Installing Cellulose Insulation."

3.5 INSTALLATION OF AIR RETARDERS (BUILDING WRAP)

- A. Cover wall sheathing with air retarders as indicated.
 - 1. Comply with manufacturer's written instructions.
 - 2. Cover upstanding flashing with 4-inch overlap.
 - 3. Seal seams, edges, and penetrations with tape.

- B. Extend into jambs of openings and seal corners with tape.

3.6 INSTALLATION OF VAPOR RETARDERS

- A. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Seal vertical joints in vapor retarders over framing by lapping not less than two wall studs. Fasten vapor retarders to framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches o.c.
- C. Seal overlapping joints in vapor retarders with adhesives or vapor-retarder tape according to vapor-retarder manufacturer's instructions. Seal butt joints and fastener penetrations with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
- D. Firmly attach vapor retarders to substrates with mechanical fasteners or adhesives as recommended by vapor-retarder manufacturer.
- E. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarder.
- F. Repair any tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

3.7 MOISTURE BARRIER

- A. Install moisture barrier below low permeable non-swelling material under buildings and at building perimeters in locations and to extent indicated on the Drawings.
- B. Seal vertical joints in moisture barrier over concrete foundation walls by lapping per manufacturer's recommendations. Fasten to concrete as indicated on the Drawings.
- C. Seal horizontal overlapping joints in moisture barrier according to moisture-barrier manufacturer's instructions. Seal butt joints and fastener penetrations with moisture-barrier tape.
- D. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating moisture-barrier with moisture-barrier tape to create a moisture tight seal between penetrating objects and moisture barrier.
- E. Repair any tears or punctures in moisture barrier immediately before concealment by other work. Cover with moisture-barrier tape or another layer of moisture barrier.

3.8 PROTECTION

- A. Protect installed insulation, air retarder, vapor retarders and moisture barrier from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

This Section 07310 replaces Section 07311 in its entirety by R0002

SECTION 07310

ASPHALT SHINGLES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Asphalt shingles.
2. Felt underlayment.
3. Self-adhering ice and water shield sheet underlayment.

B. Related Sections include the following:

1. Division 6 Section "Rough Carpentry" for roof deck wood structural panels.
2. Division 7 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings and counterflashings not part of this Section.

1.03 DESCRIPTION

A. Work included: Provide shingle roofing including accessories where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.04 SUBMITTALS

A. Product data: For each type of product indicated. Submit technical product data, installation instructions and recommendations from shingle, roofing felt and metals manufacturers, including certification data and statement that materials comply with requirements.

B. Samples for Verification: For the following products, of sizes indicated, to verify color selected.

1. Asphalt Shingle: Full-size asphalt shingle strip.
2. Ridge and Hip Cap Shingles: Full-size ridge and hip cap asphalt shingle.
3. Self-Adhering Ice and Water Shield Sheet Underlayment: 12 inches square.

C. Warranty: The contractor shall furnish a separate shingle manufacturer's and contractor's warranty for the type of shingles specified. The manufacturer's warranty shall be full 5 year labor and material warranty for manufacturing defects and 25 year limited warranty. In addition to the manufacturer's warranty, the contractor shall cover a period of two years from date of shingle acceptance by the

Contracting Officer. Repair and replacement of defective work shall be done without cost to the Government. The contractor's warranty shall provide that:

1. If within that period the asphalt T-Lock shingles tear or blow off the roof in whole or in part because of winds of any velocity less than 75 miles per hour, replacement of shingles, including both labor and materials, shall be the responsibility of the Contractor.
2. All Tabbed shingles on general roof area, and around roof and vent flashings and eave and rake edges found to be free of adhesion during the 2 year warranty period shall be hand sealed at the responsibility of the Contractor.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Shingles: Shall be "Custom Lok 25" mineral surfaced lock tab asphalt (organic felt) shingle roofing, as manufactured by CertainTeed Corporation or equal approved by the Contracting Officer. Shingles shall weigh no less than 250 pounds per square and shall bear a Class "C" fire rating label. Ridge shingles shall be job-fabricated from same shingles.

B. Felts (organic):

1. Shingle underlayment to be Type II, No. 30 asphalt saturated organic felt for roofing meeting ASTM D226.
2. Membrane waterproofing to be Type II, No. 30 asphalt saturated roofing felt meeting ASTM D224.
3. Self-Adhering Ice and Water Shield Sheet Underlayment: Similar and equal to "Weather Watch" as manufactured by GAF Corp. or "WinterGuard" as manufactured by CertainTeed Corporation or approved equal

C. Cements and Sealant:

1. Asphalt plastic cement shall be fibrated asphalt complying with ASTM D2822 or 4586 for trowel application.
2. Sealant shall be single component base sealing compound, Aluminum color meeting Fed Spec TT-S-230C (Feb 70, Type: Urethane).

E. Sheet Metal:

1. Pre-finished galvanized steel sheet for Style "D" roof edge metal, hot-dipped zinc-coated minimum 29 gauge sheet metal, commercial quality with baked-on enamel factory finish.
2. Galvanized sheet steel for valley metal: hot-dipped zinc-coated minimum 28 gauge sheet metal, commercial quality with baked-on enamel factory finish, color as approved by Contracting Officer.

3. Solder, Flux, sealants and accessories: As necessary and compatible to the material being installed.

F. Fasteners: Nails for shingles shall be hot-dipped galvanized steel with sharp points and flat heads 3/8" to 7/16" in diameter. Steel nails shall have annular threads; nail shanks shall be at least 0.120 inch and not more than 0.135 inch in outside diameter. Nails for fastening asphalt saturated felt shall conform to Fed Spec FF-N-105 (Aug 77, Type II, Style 20). Length as recommended by shingle manufacturer. Staples will not be permitted for fastening of roofing materials. Fasteners for sheet metal work shall be galvanized or cadmium-plated steel.

2.02 OTHER MATERIALS

- A. Provide all other materials necessary for a complete and proper installation as approved by the Contracting Officer.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

- B. Verify that the wood decks are dry, properly sloped for drainage, and completely secured.

3.02 UNDERLAYMENT AND SHINGLE INSTALLATION

- A. Install systems per the manufacturer's written instructions as approved by the Contracting Officer.

B. Secure roofing shingles in accordance with manufacturer's recommendations for high wind areas. In addition, seal each shingle on entire roof, including rakes, eaves and ridge caps, using two 1-inch diameter spots of roofing cement near edge of each shingle. Cement shall be placed so it will squeeze to edge of shingle when pressed down.

C. Metal Roof Flashings: Provide approved flashings around sewer vents and other miscellaneous roof penetrations. Set flashing flanges into full bed of plastic cement. Install prefinished Style "D" roof edge metal flashings on all rake and eave edges. Set flashing in full bed of plastic cement. Apply a full bed of plastic cement between all shingle layers and to deck around all roof flashings and at roof to wall terminations. Provide a continuous bead of approved sealant around the top of all vent and appliance flashings. Seal the junction of metal sleeves and the flanges to shingles with an application of approved sealant.

D. Roof Edge Seal and Felt Application: Apply underlayment of two layers of asphalt saturated felt membrane waterproofing specified herein before over roof sheathing. Lay felt parallel to eaves. Begin with a 19 inch wide felt starter course laid along eaves in a full bed of plastic cement on sheathing. Follow with a 36 inch wide felt course laid along eaves, completely overlapping the starter course and sheathing beyond in a full bed of plastic cement. Continue the course by 18 inches, exposing 16 inches of the underlying sheet; end laps shall be 4 inches. Apply plastic cement and nail felts sufficiently to deck to hold

felts in place until shingles are applied. Provide cementing of the double underlayment of felt specified, beginning at eaves and extending up the roof slope far enough to reach a line parallel to eaves and located at least 24 inches from the inside face of exterior wall, measuring horizontally. Apply a continuous layer of plastic bituminous cement at the rate of at least two gallons per 100 sq. feet to the surface of the sheathing and surface of each layer of the felt underlayment starter course before the first full course of felt is applied. Apply cement at the same rate to the 18 inch underlying portion of each succeeding course of felt included within the cemented area specified before placing of the felt included within the cemented area specified before placing the next course. Apply cement uniformly with a comb trowel so that at no point will felt touch felt. Press each overlying sheet firmly into the cemented area. Apply single layer of building felt over entire remaining roof area in shingle fashion.

NOTE: Contractor will have the option to provide an approved manufactured roof edge seal similar and equal to "Weather Watch" ice and water barrier as manufactured by GAF Corp or "WinterGuard" as manufactured by CertainTeed Corporation or approved equal in lieu of specified two ply felt seal. Fasten strip in place with one row of nails 1-1/2 inches above lower edge and spaced 6 to 8 inches on centers. Apply the starter shingles laid with cutouts reversed and flush with metal drip edge. Lay first course of shingles directly on top of starter strip, flush and even with metal drip edge. Align strip properly, centering cutouts on starter strip tabs. Nail each shingle from the end adjoining previously applied shingle. Provide 2 inch headlap. Secure roofing shingles in accordance with manufacturer's recommendations for high wind area application and as specified herein. In addition, provide plastic cement tabbing of each cut shingle on entire roof including ridge caps using two 1 inch diameter spots of cement near edge of shingle. Cement shall be placed so it will squeeze to edge of shingle when pressed down.

E. Rake, Valley, Sidewall Underlayment: Install self-adhering sheet underlayment, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated below and on Drawings, lapped in direction to shed water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days.

1. Rakes: Extend from edges of rake 24 inches beyond interior face of exterior wall.
2. Metal-Flashed Open Valleys: Install 36-inch wide self-adhering sheet underlayment directly to deck and centered in valley. Stagger end laps between layers at least 72 inches. Extend from lowest to highest point 18 inches on each side. Lap ends of strips at least 12 inches in direction to shed water, and seal with asphalt roofing cement. Fasten to roof deck with roofing nails.
3. Sidewalls: Extend beyond sidewall 18 inches and return vertically against sidewall not less than 6 inches.

F. Hips and Ridges: Form ridges with shingles cut from strip shingles by same manufacturer and matching material and color of field shingles. Bend shingles lengthwise down the center with equal exposure on each side of ridge. Lap shingles to provide not more than 5 inch exposure from butt, and nail in unexposed area 5-1/2 inches from butt and 1 inch vertically from edge. In cold weather, warm the shingle before bending. Provide cement tabbing under each side of all ridge shingles per D. above.

G. Shingles Abutting Vertical Walls: Shingles shall be fitted to vertical walls. All shingle layers adjacent to vertical walls shall be embedded into a full bed of asphalt plastic cement 4 inches wide by full length of

wall. Apply a minimum 1/2 inch thick continuous bead of polyurethane sealant between the ends of the shingles and the vertical wall.

H. Rake Edge of Building: Apply full 2 inch wide bed of plastic cement between all layers of shingles to deck.

I. Eave Edge of Buildings: Apply full 2 inch wide bed of plastic cement between all layers of shingles and to deck at all eave edges.

3.03 METAL INSTALLATION

A. Fabricate and install metal to details indicated or otherwise required by job site conditions, as approved. Conform to standards of the components and material manufacturers and Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) "Architectural Sheet Metal Manual" Fifth Edition, 1993. Joints shall be filled with approved polyurethane sealant, as required, to form a weatherproof joint.

B. Workmanship and installation methods employed for forming, anchoring, cleating, provisions for thermal expansion and contraction or all sheet metal work shall conform to commercial practice specified in the SMACNA manual.

C. Proper Surfaces and Dissimilar Materials: Surfaces to which sheet metal is to be applied shall be even, smooth, sound, thoroughly clean and dry, and free from any defects that might affect the application. Where metal abuts or members tie into dissimilar materials, protect contact surfaces with a heavy coat of bituminous paint.

D. Open Sheet Metal Valley Flashing: Cut regular shingle courses on each roof on a true line two inches from valley centerline at top of valley, and increase width between lines by one inch for each eight feet. Apply full bed of bituminous cement over the sheet metal flashing, between shingles and metal along an under the side of all layers of shingles adjoining both sides of valley. Press shingles tightly into the plastic bituminous cement. Seal edges of shingles on both sides of valleys with a heavy bead of polyurethane sealant.

1. Valley flashings, where sloping roofs intersect, shall be constructed using not less than 20 inch wide, 28 gauge galvanized metal sheets in full one piece lengths. Form the sheets to fit valley with metal extending 10 inches up the slope on each side. Nail at approved laps and on both sides just sufficiently to hold metal in place. Remove all wrinkles in metal. Do not cut off shingles without protecting valley metal surfaces. Scratched or scored metal shall be replaced by the contractor at no additional cost to the Government.

E. Roof Edge Flashing: Provide prefinished (colored) galvanized style "D" metal drip edge on all roof edges (rakes and eaves). Provide longest lengths available, but in no case shall lengths less than 36 inches long be installed. Anchor metal to roof edge using specified roofing nails spaced 6 to 8 inches separate and one inch in from inner edge of metal flange. Fit metal drip edge tight to fascia. Notch drip edge of metal as required to fit over gutter hangers, as approved.

F. Metal Roof Penetration Flashing : Provide approved flashings around sewer vents, electrical masts and miscellaneous roof penetrations. Set flashing flanges in a full bed of plastic cement.

1. Set all layers of shingles around roof penetrations in a full four-inch wide bed of plastic cement.
2. Provide a continuous bead of polyurethane sealant around the top of all vent and appliance flashings as approved. Seal the junction of the metal sleeve and the flange to shingles with an application of sealant.

3.04 SEALANT APPLICATION

A. Application of polyurethane sealant shall be accomplished in strict accordance with the sealant manufacturer's published instructions.

The following Certificate of Guarantee must be signed at the completion of the project.

"Certificate of Guarantee"

We, (Name of Applicator Company), agree to maintain the roofing and flashing on the below mentioned building for the period indicated. This Agreement is to render the roof and flashing waterproof, subject to the conditions outline below.

Owner _____ of _____ Building _____ -

Location _____

Location _____ of _____ Building _____ (Street
Address) _____
City _____
State _____
Number _____ of _____ square _____ feet _____ in _____ roof

This Guarantee is effective this _____ day of _____, _____.
The manufacturer's warranty is five years labor and material for manufacturing defects and a 25-year limited warranty. It is understood and agreed that we will not be responsible for leaks in the roofing or flashing due to excessive winds, distortion of the foundation on which the roofing or flashing rests, excessive hail storms, or any other conditions over which we have no control.

Signed

(Name of Applicator Company)

By

(Signature and Title)

END OF SECTION

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SECTION 07460

SIDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Steel siding.
 - 2. Aluminum soffit.
 - 3. Trim, column covers and miscellaneous accessories.
 - 4. Exterior shutters and gable vents.
- B. Related Sections include the following:
 - 1. Division 6 Section "Rough Carpentry" for sheathing and air-infiltration barrier.
 - 2. Division 7 Section "Building Insulation" for insulation over wall sheathing.
 - 3. Division 7 Section "Sheet Metal Flashing and Trim" for flashing, gutters, metal trim and other sheet metal work.
 - 4. Division 7 Section "Joint Sealants" for field-applied sealants.

1.3 SUBMITTALS

- A. Product Data: For each type of product specified. Include identification of materials; dimensions of individual components; installation instructions; and available profiles, textures, and colors.
- B. Samples for Verification: Full-size units of each type of siding and trim indicated; in sets for each color, texture, and pattern specified.
 - 1. 12-inch- long-by-actual-width samples of siding.
 - 2. 12-inch- long-by-actual-width samples of trim.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has completed siding installations similar in material, design, and extent to that indicated for Project that has resulted in construction with a record of successful in-service performance.
- B. Source Limitations for Siding and Accessories: Obtain each color, texture, pattern, and type of siding and related accessories from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's unopened packages or bundles with labels intact.
- B. Store materials in a dry, well-ventilated, weathertight place. Comply with manufacturer's written instructions for storage, handling, and protection.

1.6 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with siding installation only if existing and forecasted weather conditions permit siding to be installed according to manufacturer's written instructions and if substrate is completely dry.

1.7 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Project Warranty: Submit a written warranty, executed by siding manufacturer, agreeing to repair or replace siding that fails in materials or workmanship within the specified warranty period. Failures include, but are not limited to, cracking, deforming, fading, or otherwise deteriorating beyond normal weathering. Fading is defined as loss of color, after cleaning with product recommended by manufacturer, of more than 4 color-difference units as measured according to ASTM D 2244.
 - 1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SIDING

- A. Formed Steel Siding: Steel siding and accessories fabricated from 0.017-inch- thick, galvanized steel sheet complying with ASTM A 653, G90 , and as follows:
 - 1. Horizontal Pattern: 8-inch exposure.
 - 2. Horizontal Pattern: 10-inch exposure in double 5-inch style.
 - 3. Finish: Manufacturer's standard primer and PVC finish over zinc-phosphate pretreatment; medium-grain wood texture finish.

2.2 SOFFIT

- A. Aluminum Soffit: Aluminum soffit complying with AAMA 1402, fabricated from aluminum sheet in alloy recommended by siding manufacturer, and as follows:
 - 1. Pattern: 6-inch exposure.
 - 2. Ventilation: Provide perforated soffit.
 - 3. Thickness: 0.024 inch nominal.
 - 4. Finish: Manufacturer's standard primer and baked-on acrylic topcoat.

2.3 ACCESSORIES

- A. Siding Accessories: Provide starter strips, edge trim, window head flashing, corner cap, and other items as recommended by manufacturer for building configuration; match type of siding.
- B. Decorative Accessories: Provide the following types of decorative accessories as indicated:
 - 1. Metal door and window casings.
 - 2. Metal fasciae.
 - 3. Metal moldings and trim.
 - 4. Metal column covers: square fluted aluminum column covers with cap and base pieces and associated mounting accessories and fasteners.
- C. Fasteners: Noncorrosive aluminum siding nails, in sufficient length to penetrate a minimum of 1 inch into substrate. Provide prefinished fasteners in color to match siding where face nailing is unavoidable.

2.4 COLORS AND TEXTURES

- A. Where manufacturer's standard products are indicated, provide siding and accessories complying with the following requirements:
 - 1. Color as indicated on the Drawings. Texture to be manufacturer's standard medium-grain wood texture.

2.5 EXTERIOR SHUTTERS

- A. Fixed Exterior Shutters: Open louver type of ultra-violet light stabilized polypropylene copolymer with molded-through color and wood grain and with midpoint horizontal rail.
- B. Fasteners: Manufacturer's standard brackets and fasteners.
- C. Color, style and size: As indicated on the Drawings.

2.6 GABLE VENTS

- A. Gable Vents: Open louver type of ultra-violet light stabilized polypropylene copolymer with molded-through color. Vents to have double baffle system for increased weather resistance, sealed-in fiberglass insect screening and integral nailing flange.
- B. Fasteners: Manufacturer's standard.
- C. Color, style and size: As indicated on the Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for substrates, installation tolerances, and other conditions affecting performance of siding. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Coordinate installation with flashings and other adjoining construction to ensure proper sequencing.

3.3 INSTALLATION

- A. General: Comply with siding manufacturer's written installation instructions applicable to products and applications indicated, unless more stringent requirements apply. Center nails in elongated nailing slots without binding siding to allow for thermal movement. Overlap joints to shed water away from direction of prevailing wind.
- B. Corner Trim Protection: Provide wood blocking at the base of outside corner trim as recommended by the siding manufacturer to protect against vermin infiltration and to reinforce metal corner trim against accidental damage.
- C. Install ~~aluminum- steel~~ siding, aluminum soffit, and accessories according to AAMA 1402.
- D. Isolate dissimilar metals by separating from siding with rubber gaskets, elastomeric sealant, or rubber washers where fasteners penetrate siding. Dissimilar metals behind siding may be isolated by covering with polyethylene film.
- E. Install exterior shutters and gable vents per siding manufacturer's recommendations.

3.4 ADJUSTING AND CLEANING

- A. Remove and replace damaged, improperly installed, or otherwise defective siding materials with new materials complying with specified requirements.
- B. Clean finished surfaces according to siding manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION

SECTION 07620
SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following sheet metal flashing and trim:

1. Formed roof drainage system.
2. Formed wall flashing and trim.
3. ~~Formed aluminum splash pans.~~
4. Polypropylene or concrete splash blocks.

- B. Related Sections include the following:

1. Division 6 Section "Finish Carpentry" for exterior standing and running trim.
2. Division 6 Section "Rough Carpentry" for wood nailers, curbs, and blocking.
3. Division 7 Section "Asphalt Roofing Shingles" for installing sheet metal flashing and trim integral with roofing.
4. Division 7 Section "Joint Sealants" for field-applied sheet metal flashing and trim sealants.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Wind Zone 3: For velocity pressures of 46 to 104 lbf/sq. ft. : 208-lbf/sq. ft. perimeter uplift force, 312-lbf/sq. ft. corner uplift force, and 104-lbf/sq. ft. outward force.
- C. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change (Range): 120 deg F , ambient; 180 deg F , material surfaces.
- D. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show layouts of sheet metal flashing and trim, including plans and elevations. Distinguish between shop- and field-assembled work. Include the following:
 - 1. Identify material, thickness, weight, and finish for each item and location in Project.
 - 2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
 - 3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.
 - 4. Details of expansion-joint covers, including showing direction of expansion and contraction.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
 - 1. Sheet Metal Flashing: 12 inches long. Include fasteners, cleats, clips, closures, and other attachments.
 - 2. Trim: 12 inches long. Include fasteners and other exposed accessories.
 - 3. Accessories: Full-size Sample.

1.5 QUALITY ASSURANCE

- A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.
- B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack materials on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

1.7 COORDINATION

- A. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

PART 2 - PRODUCTS

2.1 SHEET METALS

- A. Aluminum Sheet: ASTM B 209 , Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, finished as follows:

1. Mill Finish: Standard one-side bright.
 2. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Fluoropolymer 2-Coat System: Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2604 or 2605.
 - 1) Color: As selected by Architect from manufacturer's full range.
 - B. Prepainted, Metallic-Coated Steel Sheet: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.
 2. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Class AZM150 coating designation, Grade 275; structural quality.
 3. Exposed Finishes: Apply the following coil coating:
 - a. Factory Prime Coating: Factory-applied, baked-on epoxy primer coat; with a minimum dry film thickness of 0.2 mil .
 - b. Siliconized-Polyester Coating: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil for primer and 0.8 mil for topcoat.
 - 1) Color: White.
 - c. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 1) Fluoropolymer 2-Coat System: Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with physical properties and coating performance requirements of AAMA 2604, except as modified below:
 - a) Humidity Resistance: 1000 hours.
 - b) Salt-Spray Resistance: 1000 hours.
 - 2) Color: White.
- 2.2 UNDERLAYMENT MATERIALS
- A. Polyethylene Sheet: 6-mil- thick polyethylene sheet complying with ASTM D 4397.
 - B. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
 - C. Slip Sheet: Rosin-sized paper, minimum 3 lb/100 sq. ft. .

2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
 - 1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
 - 2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
 - 3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
 - 4. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
- C. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
- D. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane, ~~polysulfide or silicone polymer~~ sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.
- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- G. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
- B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
- C. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 - 1. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 2. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

- D. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- E. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric or butyl sealant concealed within joints.
- F. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.
- G. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
 - 1. Thickness: As recommended by SMACNA's "Architectural Sheet Metal Manual" for application but not less than thickness of metal being secured.

2.5 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required, in continuous, seamless, site-fabricated sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.
 - 1. Gutter Style: Ogee.
 - 2. Expansion Joints: Lap type.
 - 3. Gutters with Girth up to 15 Inches : Fabricate from the following material:
 - a. Prepainted Metallic Coated Steel: 0.0217 inch thick.
- B. Downspouts: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
 - 1. Manufactured Hanger Style: Manufacturer's standard.
 - 2. Fabricate downspouts from the following material:
 - a. Prepainted Metallic Coated Steel: 0.0217 inch thick.
- C. Downspout Extensions: Fabricate rectangular extensions from same material as downspouts.
 - 1. Manufactured Extension Style: Manufacturer's standard.
 - 2. Fabricate extensions from the following material:
 - a. Prepainted Metallic Coated Steel: 0.0217 inch thick.
- D. Drip Edges at Roof Eaves and Rakes: ~~Fabricate from the following material:~~ As specified in Section 07310, Asphalt Shingles.
 - ~~1. Aluminum: 0.0320 inch thick.~~
 - ~~2. Galvanized Steel: 0.0217 inch thick.~~
 - ~~3. Prepainted, Metallic Coated Steel: 0.0217 inch thick.~~

2.6 STANDING AND RUNNING TRIM WRAP

- A. Sheet Metal Fabrications: For locations such as fascia at eaves and rakes and band board trim, and as otherwise indicated. Fabricate in minimum 96-inch- long, but not exceeding 10-foot-long, sections. Furnish with 6-inch- wide joint cover plates.
 - 1. Joint Style: Lap, 4 inches wide.
 - a. Aluminum: 0.050 inch thick.
 - b. Prepainted, Metallic -Coated Steel: 0.0276 inch thick.

~~2.7~~ ~~SPLASH PANS~~

- ~~A. Splash Pans: Fabricate from the following material:~~

~~1. Aluminum: 0.040 inch thick.~~

2.7 WALL BASE FLASHING

- B. Base Flashing at Roof / Wall Intersections: Fabricate from the following material:
 - 1. Aluminum: 0.040 inch thick.
 - 2. Prepainted, Metallic -Coated Steel: 0.0276 inch thick.

2.8 ROOF-PENETRATION FLASHING

- A. Roof-Penetration Flashing: Fabricate from the following material:
 - 1. Aluminum-Zinc Alloy-Coated Steel: 0.0276 inch thick.
 - 2. Neoprene: Manufacturer's standard.

2.9 WALL SHEET METAL FABRICATIONS

- A. Openings Flashing in Frame Construction: Fabricate head, sill, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch- high end dams. Fabricate from the following material:
 - 1. Aluminum: 0.0320 inch thick.

2.10 SPLASH BLOCKS

- A. Splash Blocks: Fabricate from the following materials:
 - 1. Polypropylene: Manufacturer's standard.
 - 2. Concrete: Manufacturer's standard.

2.11 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.
 - 1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
 - 1. Coat side of uncoated aluminum sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene underlayment.
 - 3. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.
- C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
- D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric or butyl sealant.
- E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 - 1. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
- F. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be

sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.

- G. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
 - 1. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.
 - 2. Aluminum: Use aluminum or stainless-steel fasteners.
- H. Seal joints with elastomeric sealant as required for watertight construction.
 - 1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
 - 2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."
- I. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches except where pre-tinned surface would show in finished Work.
 - 1. Do not solder aluminum sheet.
 - 2. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely. Completely remove flux and spatter from exposed surfaces.
- J. Aluminum Flashing: Rivet or weld joints in uncoated aluminum where necessary for strength.

3.3 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Hanging Gutters: Attach gutters at eave or fascia to firmly anchored gutter brackets straps spaced not more than 36 inches apart. Provide end closures and seal watertight with sealant. Slope to downspouts.
 - 1. Fasten gutter spacers to front and back of gutter.
 - 2. Loosely lock straps to front gutter bead and anchor to roof deck.
 - 3. Anchor and loosely lock back edge of gutter to continuous cleat, eave or apron flashing.
 - 4. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches apart.
 - 5. Anchor gutter with spikes and ferrules spaced not more than 24 inches apart.
 - 6. Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion joint caps.
- C. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.

- D. ~~Splash Pans and Splash Blocks: Install aluminum splash pans where downspouts discharge on low sloped roofs. Secure in place in manner compatible with roofing system.~~ Install polypropylene or concrete splash blocks where downspouts discharge onto grade.

3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal roof flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.
- B. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.
1. Secure in a waterproof manner by means of snap-in installation and sealant or lead wedges and sealant, or by means of interlocking folded seam or blind rivets and sealant.
- C. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:
1. Seal with elastomeric or butyl sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.

3.5 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Openings Flashing in Frame Construction: Install continuous head, sill and similar flashings to extend 4 inches beyond wall openings.

3.6 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

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SECTION 12356
KITCHEN AND BATH CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section. Solid surface nonporous countertops are an Option (see BID SCHEDULE and Section 01270 PAYMENT).

1.2 SUMMARY

- A. This Section includes the following:
1. Wood-faced kitchen cabinets.
 2. Wood-faced vanity cabinets.
 3. Plastic-laminate countertops.
 4. Solid surface nonporous countertops
- B. Related Sections include the following:
1. Division 8 Section "Door Hardware" for coordination with bifold door pulls.
 2. Division 11 Section "Residential Appliances" for appliances mounted in kitchen casework.
 3. Division 15 Section "Plumbing Fixtures" for sink units mounted in countertops.

1.3 DEFINITIONS

- A. Exposed Surfaces of Casework: Surfaces visible when doors and drawers are closed, including face frames and visible surfaces in open cabinets or behind glass doors.
- B. Semiexposed Surfaces of Casework: Surfaces behind opaque doors or drawer fronts, including interior faces of doors and interiors and sides of drawers. Bottoms of wall cabinets are defined as "semiexposed."
- C. Concealed Surfaces of Casework: Surfaces not usually visible after installation, including sleepers, web frames, dust panels, bottoms of drawers, and ends of cabinets installed directly against and completely concealed by walls or other cabinets. Tops of wall cabinets and utility cabinets are defined as "concealed."

1.4 SUBMITTALS

- A. Product Data: For the following:
1. Cabinets.
 2. Plastic-laminate countertops.
 3. Cabinet hardware.
 4. Solid surface nonporous countertops

- B. Shop Drawings: For cabinets and countertops. Include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, hardware, edge and backsplash profiles, cutouts for plumbing fixtures, and methods of joining countertops.
- C. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of material exposed to view.
- D. Samples for Verification: As follows:
 - 1. One full-size, finished base cabinet complete with hardware, doors, and drawers, but without countertop.
 - 2. One full-size, finished wall cabinet complete with hardware, doors, and adjustable shelves.
 - 3. Plastic laminate for countertops, 8 by 10 inches.
 - 4. Solid surface nonporous countertops, 2 by 3 inches.
- E. Product Certificates: Signed by manufacturers of casework certifying that products furnished comply with requirements.

1.5 QUALITY ASSURANCE

- A. Source Limitations for Cabinets: Obtain cabinets through one source from a single manufacturer.
- B. Quality Standards: Unless otherwise indicated, comply with the following standards:
 - 1. Cabinets: KCMA A161.1.
 - a. KCMA Certification: Provide cabinets with KCMA's "Certified Cabinet" seal affixed in a semiexposed location of each unit and showing compliance with the above standard.
 - 2. Plastic-Laminate Countertops: KCMA A161.2.
 - 3. Solid surface nonporous countertops: ANSI Z124.3

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install kitchen casework until building is enclosed, wet-work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Established Dimensions: Where kitchen casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Verify dimensions of existing construction by field measurements before fabrication and indicate measurements on Shop Drawings. Provide fillers and scribes to allow for trimming and fitting.
- C. Field Measurements for Countertops: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.7 COORDINATION

- A. Coordinate layout and installation of blocking and reinforcement in partitions for support of kitchen casework.

PART 2 - PRODUCTS

2.1 COLORS, TEXTURES, AND PATTERNS

- A. Colors, Textures, and Patterns: As indicated for cabinets and plastic-laminate countertops.
- B. Colors, Textures, and Patterns for solid surface nonporous countertops: Finish shall match as close as possible the plastic-laminate manufacturer's listed color for submittal. The Contracting Officer will approve the color selection based on the solid surface nonporous manufacturer's color chart.

2.2 CABINET MATERIALS

- A. Exposed Materials: Comply with the following:
 - 1. Exposed Wood Species: As follows. Do not use two adjacent exposed faces that are noticeably dissimilar in color, grain, figure, or natural character markings.
 - a. Red oak.
 - 2. Solid Wood: Clear hardwood lumber of species indicated, free of defects, selected for compatible grain and color, and kiln dried to 7 percent moisture content.
 - 3. Plywood: Hardwood plywood complying with HPVA HP-1 with face veneer of species indicated, selected for compatible color and grain with Grade A faces and Grade C backs of same species as faces.
- B. Semiexposed Materials: Unless otherwise indicated, provide the following:
 - 1. Thermoset Decorative Panels: Medium-density particleboard complying with ANSI A208.1, Grade M-2; with surface of thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
 - a. Provide thermoset decorative overlay on both sides of shelves, dividers, drawer bodies, and other components with two semiexposed surfaces.
 - b. Provide PVC or polyester edge banding complying with LMA EDG-1 on components with semiexposed edges.
- C. Concealed Materials: Comply with the following:
 - 1. Solid Wood or Plywood: Any hardwood or softwood species, with no defects affecting strength or utility. Hardwood and softwood lumber kiln dried to 7 and 10 percent moisture content, respectively.
 - 2. Particleboard: ANSI A208.1, Grade M-2.
 - 3. Medium-Density Fiberboard: ANSI A208.2.
 - 4. Hardboard: AHA A135.4, Class 1 Tempered.

2.3 COUNTERTOP MATERIALS

- A. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.
 - 1. Grade: HGP.
 - 2. Grade for Backer Sheet: BKL.
- B. Particleboard: ANSI A208.1, Grade M-2.
- C. Plywood: Exterior softwood plywood complying with PS 1, Grade C-C Plugged, touch sanded.

D. Solid Surface Nonporous:

1. Material: Homogeneous solid sheets of filled plastic resin complying with material and performance requirements of ANSI Z124.3, Type 5 or Type 6, without a precoated finish.

2. Color and Pattern: As selected from manufacturer's full range.

2.4 CASEWORK HARDWARE

- A. General: Manufacturer's standard units complying with BHMA A156.9, of type, material, size, and finish as selected from manufacturer's standard choices.
- B. Hinges: Concealed European-style hinges.
- C. Drawer Guides: Epoxy-coated-metal, self-closing drawer guides; designed to prevent rebound when drawers are closed; with nylon-tired, ball bearing rollers; and complying with BHMA A156.9, Type B05091.
- D. Drawer and Door Pulls: Wire pulls of manufacturer's standard size. Mount door pulls horizontally at base cabinets. Pulls to be of same style used for bi-fold doors.

2.5 CABINET CONSTRUCTION

- A. Face Style: Reveal overlay; door and drawer faces partially cover cabinet body or face frames.
- B. Face Frames: 3/4-by-1-5/8-inch solid wood.
- C. Door and Drawer Fronts: Solid-wood stiles and rails, 3/4 inch thick, with 1/4-inch- thick, veneer-faced plywood center panels.
- D. Exposed Cabinet Ends: Veneer-faced plywood.
- E. Cabinet Ends: 1/2-inch- thick particleboard or 3/8-inch- thick plywood.
- F. Cabinet Tops and Bottoms: 1/2-inch- thick particleboard or 3/8-inch- thick plywood, fully supported by and secured in rabbets in end panels, front frame, and back rail.
- G. Back, Top, and Bottom Rails: 3/4-by-2-1/2-inch solid wood, interlocking with end panels and rabbeted to receive top and bottom panels. Back rails secured under pressure with glue and with mechanical fasteners.
- H. Wall-Hung Unit Back Panels: 3/16-inch- thick plywood fastened to rear edge of end panels and to top and bottom rails.

- I. Base Unit Back Panels: 1/8-inch- thick plywood fastened to rear edge of end panels and to top and bottom rails.
- J. Front Frame Drawer Rails: 3/4-by-1-1/4-inch solid wood mortised and fastened into face frame.
- K. Drawers: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
 - 1. Join subfronts, backs, and sides with glued dovetail joints.
 - 2. Subfronts, Backs, and Sides: 1/2-inch- thick solid wood or 3/8-inch- thick plywood.
 - 3. Bottoms: 1/4-inch- thick hardboard.
- L. Shelves: 5/8-inch- thick particleboard or 1/2-inch- thick plywood.
- M. Particleboard cores shall not be used in cabinet construction for frame members, doors, drawer fronts, or any other member requiring screw-holding capability.
- N. Joinery: Rabbet backs flush into end panels and secure with concealed mechanical fasteners. Connect tops and bottoms of wall cabinets and bottoms and stretchers of base cabinets to ends and dividers with mechanical fasteners. Rabbet tops, bottoms, and backs into end panels.
- O. Factory Finishing: To greatest extent possible, finish casework at factory. Defer only final touchup until after installation.

2.6 PLASTIC-LAMINATE COUNTERTOPS

- A. Configuration: Provide countertops with the following front, cove (intersection of top with backsplash), backsplash, and end-splash style. Provide seamless, rounded corners at countertop nosings and at the intersection of the countertop and backsplash:
 - 1. Front: Rolled.
 - 2. Cove: Cove molding (one-piece postformed laminate supported at junction of top and backsplash by wood cove molding).
 - 3. Backsplash: Square edge without scribe.
 - 4. End Splash: Square edge without scribe.
- B. Plastic-Laminate Substrate: Particleboard not less than 3/4 inch thick.
 - 1. For countertops at sinks and lavatories, use phenolic-resin particleboard or exterior-grade plywood.
- C. Paper Backing: Provide paper backing on underside of countertop substrate.

2.7 SOLID SURFACE NONPOROUS COUNTERTOPS

- A. Countertop and backsplash shall be constructed of sheet material and be similar to the details shown on the drawings for plastic-laminate . Material shall be 1/2 inch thickness, cast, and filled nonporous solid surfacing composed of acrylic polymer, mineral fillers, and pigments. Superficial damage to a depth of 0.010 inch shall be repairable by sanding or polishing. Material shall comply with the following performance requirements.
 - 1. Tensile Strength; 4100 psi, when tested in accordance with ASTM D 638.
 - 2. Hardness; Barcol Impressor 50 when tested in accordance with ASTM D 2583.
 - 3. Flammability; rated Class I with a flame spread of 25 maximum and a smoke developed of 100 maximum when tested in accordance with ASTM E 84.

4. Boiling water resistance; no effect when tested in accordance with NEMA LD 3.
5. High temperature; no effect when tested in accordance with NEMA LD 3.
6. Liquid absorption; 0.06% maximum (24 hours) when tested in accordance with ASTM D 570.
7. Sanitation; National Sanitation Foundation approval for food contact in accordance with Standard 51 and approval for food area applications.
8. Impact resistance; no failure for ball drop when tested in accordance with NEMA LD 3.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install casework with no variations in flushness of adjoining surfaces; use concealed shims. Where casework abuts other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match casework face.
- B. Install casework without distortion so doors and drawers fit openings and are aligned. Complete installation of hardware and accessories as indicated.
- C. Install casework and countertop level and plumb to a tolerance of 1/8 inch in 8 feet.
- D. Fasten cabinets to adjacent units and to backing.
 1. Fasten wall cabinets through back, near top and bottom, at ends and not less than 24 inches o.c. with No. 10 wafer-head screws sized for 1-inch penetration into wood framing, blocking, or hanging strips.
- E. Fasten plastic-laminate countertops by screwing through corner blocks of base units into underside of countertop. Form seams using splines to align adjacent surfaces, and secure with glue and concealed clamping devices designed for this purpose.
- F. Install solid surface nonporous countertops according to manufacturer's written instructions, using appropriate substrate/supporting structure as recommended by manufacturer. Form seams to comply with manufacturer's written instructions, using adhesive color to match countertops. Dress joints and remove surface scratches, and clean entire surface.

3.2 ADJUSTING AND CLEANING

- A. Adjust casework and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.
- B. Clean casework on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.
- C. Cabinet and countertop surfaces shall be cleaned in accordance with manufacturer's instructions.

END OF SECTION

SECTION 12491
HORIZONTAL LOUVER BLINDS AND DRAPERY RODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following types of venetian blinds and accessories:
 - 1. Miniblinds with aluminum louver slats.
 - 2. Traverse rods: at window openings over 5-feet wide and at exterior terrace door with full sidelight.

1.3 DEFINITIONS

- A. Miniblind: Venetian blind with nominal 1-inch- wide louver slat.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.
- B. Shop Drawings: Show location and extent of horizontal louver blinds. Include elevations, sections, details, and dimensions not shown in Product Data. Show installation details, mountings, attachments to other Work, operational clearances, and relationship to adjoining work.
- C. Samples for Initial Selection: For each colored component of each type of horizontal louver blind indicated.
 - 1. Include similar Samples of accessories involving color selection.
- D. Maintenance Data: For horizontal louver blinds to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining horizontal louver blinds and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to finishes and performance.
 - 3. Operating hardware.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain horizontal louver blinds through one source from a single manufacturer.
- B. Corded Window Covering Product Standard: Provide horizontal louver blinds complying with WCMA A 100.1.
- C. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
 - 1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Contracting Officer.
 - 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver blinds in factory packages, marked with manufacturer and product name, and location of installation using same room designations indicated on Drawings.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install horizontal louver blinds until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where horizontal louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operable glazed units' operation hardware throughout the entire operating range. Notify Contracting Officer of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 HORIZONTAL LOUVER BLINDS, ALUMINUM LOUVER SLATS

- A. Louver Slats: Aluminum, alloy and temper recommended by producer for type of use and finish indicated; with crowned profile and radiused corners.
 - 1. Nominal Slat Width: 1 inch for miniblinds.
 - a. Slat Spacing: Not less than every 20-mm for 15.2 slats or more per foot.
 - 2. Nominal Slat Thickness: Not less than 0.008 inch.
 - 3. Slat Finish: Off white.
- B. Headrail/Valance: Decorative, integrated headrail/valance not requiring a separate valance or end brackets for finished appearance; formed steel or extruded aluminum; long edges returned or rolled; fully enclosing operating mechanisms on three sides and ends; capacity for one blind per headrail.
 - 1. Finish Color Characteristics: Match color, texture, pattern, and gloss of louver slats.

- C. Bottom Rail: Formed-steel or extruded-aluminum tube, sealed with plastic or metal capped ends top contoured to match crowned shape of louver slat, bottom contoured for minimizing light gaps; with enclosed and protected ladders and tapes to prevent their contact with sill.
- D. Tilt Control: Consisting of enclosed worm gear mechanism, slip clutch or detachable wand preventing overrotation, and linkage rod, for the following operation:
 - 1. Tilt Operation: Manual with clear plastic wand.
 - 2. Tilt: Full.
- E. Lift Operation: Manual, cord lock; locks pull cord to stop blind at any position in ascending or descending travel.
- F. Ladders: Evenly spaced to prevent long-term louver sag.
 - 1. For Blinds with Nominal Slat Width 1 Inch or Less: Braided string.
- G. Mounting: End mounting permitting easy removal and replacement without damaging blind or adjacent surfaces and finishes; with spacers and shims required for blind placement and alignment indicated.
 - 1. Provide intermediate support brackets if end support spacing exceeds spacing recommended by manufacturer for weight and size of blind.
- H. Bottom Brackets: Provide brackets to secure bottom of blinds on doors to patios. Provide brackets on both active and inactive leafs.

2.2 HORIZONTAL LOUVER BLINDS FABRICATION

- A. Product Standard and Description: Comply with AWCMA Document 1029, unless otherwise indicated, for each horizontal louver blind designed to be self-leveling and consisting of louver slats, rails, ladders, tapes, lifting and tilting mechanisms, cord, cord lock, tilt control, and installation hardware.
- B. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.
 - 1. Lifting and Tilting Mechanisms: With permanently lubricated moving parts.
- C. Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74 deg F:
 - 1. Blind Units Installed Outside Jambs: Width and length as determined by locating bottom edge and side edges of blind units midpoint on window casings (bottom and side casings). Terminations between blinds of end-to-end installations will be at centerlines of mullion or other defined vertical separations between openings.
- D. Installation Brackets: Designed for easy removal and reinstallation of blind, for supporting headrail, valance, and operating hardware, and for hardware position and blind mounting method indicated.
- E. Installation Fasteners: Not fewer than two fasteners per bracket, fabricated from metal noncorrosive to blind hardware and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.

- F. Color-Coated Finish: As indicated.
 - 1. Metal: For components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.
- G. Component Color: Provide rails, cords, ladders, and exposed-to-view metal and plastic matching or coordinating with slat color, unless otherwise indicated.

2.3 TRAVERSE RODS

- A. Traverse Rods: One-inch oval section, heavy duty type, manufacturer's standard product for width of openings; complete with mounting brackets and hardware.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 HORIZONTAL LOUVER BLIND INSTALLATION

- A. Install blinds level and plumb and aligned with adjacent units according to manufacturer's written instructions, and located so exterior louver edges in any position are not closer than 2 inches to interior face of glass. Install intermediate support as required to prevent deflection in headrail. Allow clearances between adjacent blinds and for operating glazed opening's operation hardware, if any.
- B. Head Mounted: Install headrail on face of opening head.
- C. Terrace Door with Full Sidelight (inactive leaf): Install bottom brackets on face of doors below glazing.

3.3 ADJUSTING

- A. Adjust horizontal louver blinds to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

- A. Clean blind surfaces after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure that horizontal louver blinds are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged blinds that cannot be repaired, in a manner approved by Contracting Officer, before time of Substantial Completion.

3.5 Horizontal Louver Blind Placement Schedule

- A. Horizontal louver blinds shall be provided at all exterior windows, ~~except transom window above front entry door.~~
- B. Horizontal louver blinds shall be provided at terrace door and sidelight (active and inactive leaves).

3.6 TRAVERSE ROD INSTALLATION

- A. Provide blocking at all locations as required to securely mount rods.
- B. Use manufacturer's standard brackets and hardware; install per manufacturer's instructions.
- C. Install rods above transom windows where transom windows occur above casement windows.

END OF SECTION

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SECTION 15400

PLUMBING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description: Work includes building drainage systems, potable water system, plumbing fixtures, and associated equipment and appurtenances.
- B. Contract Requirements: General Conditions, Supplementary Conditions, Division 1, and Sections 15010 and 15050 apply to Work in this section.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable city, county, and state codes and ordinances. In case of conflict with drawings or specifications, the codes and ordinances govern.
- B. Basis:
 - 1. Uniform Building Code
 - 2. Uniform Plumbing Code

1.3 SUBMITTALS

- A. General: Submit in accordance with Division 1, Section 15010, and the following.
- B. Product Data:
 - 1. Potable Water Piping
 - 2. Building Drainage Systems
 - 3. Natural Gas Piping
 - 4. Pipe Hangers and Supports
 - 5. Cleanouts
 - 6. Vents Through Roof
 - 7. Water Hammer Arresters
 - 8. Relief Valves
 - 9. Plumbing Trim
 - 10. Plumbing Fixtures
 - 11. Wall Seal
 - 12. Plumbing Equipment
- C. Certificates:
 - 1. Certificates of Inspection by Local Authorities
 - 2. Certificates of Satisfactory Bacteriological Test

1.4 PIPING, GENERAL

- A. Description: Comply with requirements in Section 15060.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Description: Comply with Article "Quality Assurance" provisions, specifications, and manufacturer's data. Where these may be in conflict, the more stringent requirements govern.

2.2 POTABLE WATER PIPING

- A. Description: Piping for potable and non-potable water usage.
- B. 3 Inch and Smaller: Comply with requirements in Section 15060. Use copper tubing.
- C. Underground Piping: Type K soft drawn copper tubing.

2.3 BUILDING DRAINAGE SYSTEMS

- A. Description: Provide the following piping systems.
1. Waste and vent.
 2. Indirect drain, including equipment, air vent, appurtenance, and cooling coil condensate drains.
- B. Piping Materials:
1. Polyvinyl Chloride (PVC) pipe, Schedule 40 Type 1 per ASTM F891, and DWV fittings conforming to ASTM D2665. Joined with solvent cement.
 2. Copper:
 - a. Pipe: Hard drawn drainage tubing, ASTM B 306.
 - b. Fittings: Cast bronze, ANSI B16.23.
- C. Underground and Above-Grade Waste and Vent Piping:
1. 4 Inch and Smaller: PVC.
- D. Indirect Drain Piping: Copper, except PVC where noted in Contract Documents.

2.4 NATURAL GAS PIPING

- A. Description: Comply with requirements in Section 15060. Use steel piping with the following exceptions.
1. Unions: Use only type approved by UPC and Authority Having Jurisdiction.
 2. Valves:

- a. Plug: 200 psig w.o.g., screwed, cast iron body, lubricated, UL listed and labeled for 175 psi working pressure, regular port or full pipe area port, material ASTM A 126, Grade B, wrench operated.
 - b. Ball: 275 psi w.o.g., bronze body, screwed, UL listed and labeled for 250 psi working pressure, regular post, Teflon trim.
3. Pressure Regulator: Cast iron body, adjustable spring with seal cap, fiberglass reinforced nylon valve stem, Buna-N soft valve seat and diaphragm, aluminum orifice, internal relief valve, die cast aluminum alloy diaphragm case, and vent valve and vent connection. Regulator selected for capacity and inlet and outlet pressures indicated in the Contract Documents.

2.5 PIPE HANGERS AND SUPPORTS

- A. Comply with requirements in Section 15060.
- B. Building Drainage Piping: Minimum 1 hanger or support between any 2 joints or fittings.
- C. Plumbing Chases: Manufactured pipe support and alignment system.

2.6 CLEANOUTS

- D. Wall Cleanouts:
 1. Tee: PVC cleanout tee with plug.
 2. Frame and Cover: Chrome plated bronze square frame with anchor lugs, secured stainless steel face-of-wall cover.

2.7 VENTS THROUGH ROOF

- A. General: Flash vent stacks extending through roof with prefabricated penetration flashing units.

2.8 WATER HAMMER ARRESTERS

- A. General: Factory-sealed shock arresters with direct action bellows or piston, rated in accordance with Plumbing Drainage Institute Standard P.D.I. WH-201 Standard or ASSE 1010.

2.9 RELIEF VALVES

- A. General: ASME Code rated water relief valves. Select for capacity to exceed rating of connected equipment.

2.10 PLUMBING FIXTURES AND TRIM, GENERAL

- A. Fixture Color: White unless otherwise indicated in the Contract Documents.

- B. Trim: Defined as any part used with a fixture, i.e., faucets, drains, traps, and supplies. Brass material, except Federal Specifications grade zinc-aluminum may be furnished for faucet handles.
- C. Exposed Metal Parts: Chromium over nickel finish.
- D. Stops: Include in each water connection to each fixture, except where a fitting has integral stops, loose key pattern with shield, polished finish where exposed and rough where concealed.
- E. Exposed Supplies: 1/2 inch outside diameter tubing.
- F. Escutcheons: Include at each point where pipe or other fitting enters wall at fixture.
- G. Tailpiece Extension, Trap, and Arm to Wall: 17 gage (0.043 inch), seamless tubing.
- H. Vacuum Breaker: Include on the water supply to each fixture which has a water connection located below the rim or a hose attachment, flow-through pattern.
- I. Faucets: Seals and seats of single control faucets shall be combined in one replaceable cartridge designed to be interchangeable with all lavatories, bathtubs and kitchen sinks, or having replaceable seals and seats removable either as a seat insert or as part of a replaceable valve unit.

2.11 PLUMBING FIXTURES AND TRIM, WATER CLOSETS

- A. Floor Mounted Water Closets WC-1: 1.6 gallons per flush; vitreous china; elongated siphon action bowl; close coupled tank, float-type water control; and left hand chrome plated trip lever.
 - 1. Closet Seat: White, closed front, elongated with cover.

2.12 PLUMBING FIXTURES AND TRIM, LAVATORIES

- A. L-1, Lavatory, Countertop, Barrier-Free:
 - 1. Description: Oval size 20 inch by 17 inch.
 - 2. Construction: Vitreous china, self-rimming, 4 inch faucet centers.
 - 3. Components:
 - a. Faucet: Chrome finish, washerless, single lever-type metal handle, 4 inch centerset exposed deck mounting, red/blue handle indicators, lift rod hole, with 2.0 gpm at 60 psi aerator and 1/2 inch IPS adapters.
~~Supplies: Angle supply with stop and annealed vertical tube.~~
 - b. Drain: Metal pop-up drain with lift rod and 1-1/4 inch tailpiece.
 - 4. Basis of Design: Delta 520.

2.13 PLUMBING FIXTURES AND TRIM, SINKS

- A. Double Compartment Counter Mounted Sinks (S-1): Double compartment counter mounted sink; 20 gage, Type 304 or 302 stainless steel; self-rimming, integral flange and

ledge; with 1-hole drilling centered between compartments for faucet, 1 hole offset to the left for a dishwasher air gap fitting, and 1 hole offset to the right for a hose spray; overall dimensions of 19 inches front to back by 33 inches left to right by 7 inches deep; inside dimensions of each compartment of 14 inches front to back by 14 inches left to right by 7 inches deep; underside of sink shall be sound deadened.

1. Faucet: Single control faucet with diverter hose and spray, chrome finish, soft closing valve, 10-8 inch spout swings 360 degrees, and a ~~two~~ 2.0 gpm aerator.
Basis of Design: Delta 300.
2. Supplies: Angle supply with stop and annealed vertical tube.
3. Drain: Type 304 stainless steel perforated grid strainer on one side and crumb cup strainer on the other, and 1-1/2 inch diameter tailpiece.
4. Garbage Disposal: Continuous feed, automatic reversing action; 3/4 horsepower split phase motor, corrosion protection shield, stainless steel lugs.
5. Dishwasher Air Gap Fitting: ASSE 1021, plastic body, chrome plated brass cover, rated for 5 psi at 140 degrees F and 5 gpm minimum.
6. Dishwasher Hose: Rubber hose suitable for dishwasher drain; length as required for connection to dishwasher.

B. S-2, Sink, Countertop, Laundry:

1. Description: Rectangular size 21 inch by 19 inch, bowl 16 inch L by 16 inch W by 7-1/2 inch D.
2. Construction: Type 304, 18-8 stainless steel, 18 gage, self-rimming, polished finish, sound deadened.
3. Components:
 - a. Faucet: ~~High rise, washerless, single lever type metal handle, exposed deck mounting, spout height 9-7/16 inch above mounting surface, spout swing 360 degrees, vandal resistant aerator~~ Single control faucet, soft closing valve, 8 inch spout with 360 degree swing, 2.0 gpm aerator, without spray attachment.
Basis of Design: Delta 101.
 - b. Supplies: Angle supply with stop and annealed vertical tube.
 - c. Drain: Brass fitting with perforated grid strainer and 1-1/2 inch tailpiece.

2.14 PLUMBING FIXTURES AND TRIM, SHOWERS

A. Tub Bath and Shower (B-1):

1. Tub and Shower: Acrylic tub/shower unit, white in color; unit construction shall be of molded, reinforced fiberglass with a cellular inner core and a reinforced fiberglass outer protection coating; finished surface shall be of a sanitary-grade methyl-acrylate (acrylic); flame spread rating of less than 200 as tested to ASTM E162 and shall achieve a flame spread index rating of "C"; unit shall comply with HUD UM Bulletin 73A and have a smoke generated rating of less than 450. Unit shall be provided with 3 molded in soap/shampoo shelves and a textured floor. Furnish with a 1 inch outside diameter Type 304 stainless steel curtain rod.
2. Mixing Valve, Shower Head, and Diverter Tub Sprout: Pressure balancing mixing valve with integral stops and adjustable stop screw to limit handle turn. Metal blade type handle rotates 120 degree to control temperature. Basis of Design: Delta

1437. Shower head with arm and flange, 2.5 gpm flow control; diverter tub spout; solid brass body with chrome plated finish.

3. Drain: Adjustable pop-up drain ~~or approved equal~~, polished chrome finish.

2.15 PLUMBING FIXTURES AND TRIM, FLOOR DRAINS

A. FD-1, Floor Drain:

1. Description: Single-casting, coated cast iron body with integral trap, bar grate with funnel, trap primer connection, and bronze cleanout plug.
2. Basis of Design: Jay R. Smith Figure 2510.

2.16 PLUMBING FIXTURES AND TRIM, MISCELLANEOUS

C.A. HB-1, Exterior Hose Bibb:

1. Description: Frost-proof sillcock with lockshield, red bronze body with nickel-plated finish, brass rod stem with Teflon impregnated packing, Buna-N seat disc, 6 inch length, vacuum breaker.

D.B. WV-1, Washer Valve Box:

1. Description: Recessed wall box with supply valves and drain.
2. Construction and Components: 16 gauge steel with epoxy finish. Bottom ½ inch supply, ½ inch brass supply sweat connections and valves with single operating lever for hot and cold water, 2 inch drain pipe, and overflow tip.
3. Basis of Design: Guy Gray Model WB200.

E.C. VB-1, Icemaker Valve Box:

1. Description: Recessed wall box with shutoff valve.
2. Construction and Components: 16 gauge steel with epoxy finish. Bottom ½ inch inlet, 1/4 inch outlet brass compression angle valve.
3. Basis of Design: Guy Gray Model BIM875.

2.17 PLUMBING EQUIPMENT

A. Water Heater, Gas-Fired (DWH-1):

1. General: Residential, through-the-wall power vented, natural gas-fired water heater with integral storage tank.
2. Venting: Field adjustable blower/motor assembly that provides direct horizontal discharge or vertical discharge of exhaust gases in PVC pipe.
3. Construction:
 - a. Tank: Interior lined continuous over entire inner surface with ceramic coating, fiberglass insulation to meet Government energy conservation requirements.
 - b. Controls: Electronic ignition burner, with fully automatic temperature control, high temperature energy cutoff switch, combination gas valve with pressure regulator.
4. Components:
 - a. Brass drain valve.
 - b. Temperature and pressure safety relief valve.

- c. Factory installed dielectric waterway fittings.
 - d. Protective magnesium rod.
5. Basis of Design: Bradford White TTW1.

2.18 WALL SEAL

- A. Type: Commercial grade Silicone Building Sealant.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Description: Verify installation conditions as satisfactory to receive work of this section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.2 PREPARATION

- A. Field Measurements: Field verify locations of new and existing work prior to commencing work of this section.
- B. Protection: Protect surrounding areas and surfaces to preclude damage from work of this section.

3.3 INSTALLATION, APPLICATION, ERECTION, AND PERFORMANCE

- A. Description: Install, apply, erect, and perform the work in accordance with Article "Quality Assurance" provisions, specifications, and manufacturer's installation instructions and directions. Where these may be in conflict, the more stringent requirements govern.
- B. Do not cover up or enclose work until completely inspected and approved. If non-compliance, uncover work and replace to satisfaction of A/E at no additional cost to Government.

3.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements in Section 15050.

3.5 POTABLE WATER PIPING

- A. Comply with requirements in Section 15060.
- B. Space pipe supports in accordance with MSS SP-69.

3.6 BUILDING DRAINAGE PIPING

- A. General:

1. Install with uniform pitch of at least 1/4 inch per foot for horizontal waste piping within building, unless otherwise indicated in the Contract Documents. Pitch vents for proper drainage.
- B. Above-Grade Piping:
 1. Support horizontal piping to maintain alignment, prevent grade reversals, and prevent sagging.
 2. Support vertical stacks at floors with clamp anchors.
 3. Support at 3 feet maximum centers and at each joint.
- C. Underground Piping:
 1. Perform trenching and backfilling associated with plumbing installation in strict accordance with pertinent provisions of excavating, filling and grading specifications in Division 2 and Section 15050.

3.7 CLEANOUTS

- A. Waste: Install as required by UPC.

3.8 VENTS THROUGH ROOF

- A. General: Install to be weatherproof. Install flanges in roofing materials to form a watertight connection.

3.9 WATER HAMMER ARRESTERS

- A. General: Install in accordance with Plumbing and Drainage Institute Standard PDI-WH 201 and ASSE 1010 recommendations.

3.10 RELIEF VALVES

- A. General: Install and pipe outlet to nearest drain.

3.11 FIXTURES

- A. General: Locate fixtures where indicated on the Architectural drawings.
- B. Floor-Mounted Fixtures: Secure floor outlet rigidly to drainage connections and floor.
- C. Connections: Make gas- and watertight. Use 1 piece special molded gaskets for connections between earthenware of fixtures and soil pipe flanges. Do not use bulk material, including putty and plastic, for gaskets.
- D. Vents: Install for each fixture, as indicated in the Contract Document or as allowed by UPC.
- E. Trap: Install where manufacturer does not include trap for fixture.

- F. Silicone Wall Sealer: Apply between top and sides of plumbing fixtures and adjacent wall surfaces. Apply per manufacturer's recommendations to form smooth unobtrusive joint. Install 1 sample joint on each type of fixture for the Contracting Officer's review before proceeding with installation of remainder of sealant.

3.12 WATER HEATERS

- A. General: Install within a sheet metal drain pan.
- B. Components: Install as indicated in the Contract Documents.

3.13 PRESSURE TESTING

- A. Drainage Piping: Pressure test in accordance with UPC and local Authority Having Jurisdiction requirements.
- B. Water Piping: Test at full working pressure in accordance with UPC.

3.14 STERILIZATION AND FLUSHING

- A. Description: After completion of water piping installation, flush system. Comply with requirements in Section 15060. Take sample of water from system to determine compliance with Health Department standards. Obtain necessary tests from governing Health Department. If sample is not in compliance, perform sterilization as follows.
- B. Sterilization: 8 hour sterilization contact time, 50 parts per million chlorine concentration. Open valves several times; follow by flushing with clean water until residual chlorine is less than 0.2 parts per million.
- C. Results: After flushing and sterilization are complete, conduct tests to determine compliance with Health Department standards for sterilization results. If pipe system is found to be contaminated, correct defects and perform additional flushing and sterilization until satisfactory results are obtained.

3.15 CLEANING

- A. Cleaning: Prior to acceptance of work, thoroughly clean exposed items. Remove labels and traces of foreign material, using only cleaning solutions approved by manufacturers of plumbing items being careful to avoid damage to finished surfaces.

3.16 DEMONSTRATION AND OPERATION AND MAINTENANCE INSTRUCTIONS

- A. Comply with requirements in Section 15010. Total of 2 hours.

END OF SECTION

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SECTION 16050

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes grounding electrodes and conductors; equipment grounding conductors; bonding methods and materials; conduit and equipment supports; anchors and fasteners; nameplates and labels; wire markers; raceway markers; underground warning tape; sealing and fireproofing of sleeves and openings between conduits.

1.2 REFERENCES

- A. NECA (National Electrical Contractors Association) - Standard of Installation.
- B. NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.3 SYSTEM DESCRIPTION

- A. Grounding systems use the following elements as grounding electrodes:
 - 1. Metal underground water pipe.
 - 2. Rod electrode.
- B. Anchor and fasten electrical products to building elements and finishes as follows:
 - 1. Concrete Structural Elements: Provide expansion anchors.
 - 2. Concrete Surfaces: Provide self-drilling anchors and expansion anchors.
 - 3. Hollow Masonry, Plaster, and Gypsum Board Partitions: Provide toggle bolts and hollow wall fasteners.
 - 4. Wood Elements: Provide wood screws.
- C. Identify electrical components as follows:
 - 1. Nameplate for each electrical distribution and control equipment enclosure.
 - 2. Wire marker for each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.
 - 3. Raceway marker for each raceway longer than 6 feet.
 - 4. Underground warning tape along length of each underground raceway or cable.

1.4 DESIGN REQUIREMENTS

- A. Select materials, sizes, and types of anchors, fasteners, and supports to carry loads of equipment and raceway, including weight of wire and cable in raceway.

1.5 PERFORMANCE REQUIREMENTS

- A. Grounding System Resistance: 25 ohms.

1.6 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit grounding electrodes and connections; for fastening components; and nameplates, labels, and markers.
- C. Test Reports: Indicate overall resistance to ground and resistance of each electrode.

1.7 ~~CLOSEOUT SUBMITTALS~~ RECORD DRAWINGS

- A. Furnish as built drawings in conformance with the requirements of Section 01700-01702 - Closeout Procedures As Built Drawings.

~~B. Project Record Documents: Record actual locations of components and grounding electrodes.~~

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.9 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 ROD ELECTRODES

- A. Material: Copper-clad steel.
- B. Diameter: 3/4 inch.
- C. Length: 10 feet.

2.2 MECHANICAL CONNECTORS

- A. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.

2.3 EXOTHERMIC CONNECTIONS

- A. Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

2.4 WIRE

- A. Material: Stranded copper.

- B. Grounding Electrode Conductor.

2.5 ANCHORS AND FASTENERS

- A. Materials and Finishes: Corrosion resistant.

2.6 FORMED STEEL CHANNEL

- A. Description: Galvanized steel.

2.7 NAMEPLATES AND LABELS

- A. Nameplates: Engraved three-layer laminated plastic, black letters on white background.

- B. Letter Size:

1. 1/8 inch letters for identifying individual equipment and loads.
2. 1/4 inch letters for identifying grouped equipment and loads.

- C. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background.

2.8 WIRE MARKERS

- A. Description: Cloth tape, split sleeve type wire markers.

- B. Legend:

1. Power and Lighting Circuits: Branch circuit or feeder number.

2.9 CONDUIT MARKERS

- A. Description: Split-tube type.

- B. Color:

1. 12,470Y/7,200 Volt System: Red lettering on white background.
2. 120/240 Volt System: Black lettering on white background.

- C. Legend:

1. Medium Voltage System: HIGH VOLTAGE.
2. 240 Volt System: 240 VOLTS.

2.10 UNDERGROUND WARNING TAPE

- A. Description: 4 inch wide plastic tape, detectable type, colored red with suitable warning legend describing buried electrical lines.

2.11 SEALING AND FIREPROOFING

- A. Fire and Smoke Rated Surfaces:

1. Manufacturers:
 - a. 3M CP 25N/S or CP25S/L caulk.

- b. 3M FS 195 wrap or strip with restricting collar.
 - c. 3M CS 195 composite sheet.
 - d. Pipe Shield, Inc. series F fire barrier kits.
 - e. Proset Systems fire rated floor and wall penetrations.
 - f. Insta-Foam Products Insta-Fire Seal Firestop Foam.
 - g. Dow Corning Fire Stop System.
- B. General:
- 1. Furnish UL listed products.
 - 2. Select products with rating not less than rating of wall or floor being penetrated.
- C. Non-Rated Surfaces:
- 1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where conduit is exposed.
 - 2. For exterior wall openings below grade, furnish modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill annular space between conduit and cored opening or water-stop type wall sleeve.
 - 3. For interior wall or floor openings, furnish one of the following to effect seal:
 - a. Tremco Dymonic.
 - b. Sika Corp. Sikaflex Ia.
 - c. Sonneborn Sonolastic NPI.
 - d. Mameco Vilken 116 urethane caulk.

PART 3 - EXECUTION

3.1 EXAMINATION

~~A. Section 01310—Administrative Requirements: Coordination and project conditions.~~

~~B.A.~~ Verify final backfill and compaction has been completed before driving rod electrodes.

~~C.B.~~ Verify abandoned wiring and equipment serve only abandoned facilities.

3.2 EXTENSION WORK

- A. For occupied buildings, install temporary wiring and connections to maintain existing systems in service during construction.
- B. Perform work on energized equipment or circuits with experienced and trained personnel.
- C. Remove, relocate, and extend existing installations to accommodate new construction.
- D. Repair adjacent construction and finishes damaged during extension work.

3.3 INSTALLATION

- A. Grounding and Bonding Installation:
 - 1. Install rod electrodes at locations as indicated on Drawings. Install additional rod electrodes to achieve specified resistance to ground.

2. Install bonding meeting Regulatory Requirements.
3. Bond together each metallic raceway, pipe, duct and other metal objects.
4. Locate and install anchors, fasteners, and supports in accordance with NECA "Standard of Installation".
5. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
6. Obtain permission from Contracting Officer before drilling or cutting structural members.

B. Supports:

1. Fabricate supports from structural steel or formed steel members. Rigidly weld members or install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
2. Install surface mounted cabinets and panelboards with minimum of four anchors.
3. In wet and damp locations install steel channel supports to stand cabinets and panelboards 1 inch off wall.
4. Install sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

C. Identification Components:

1. Degrease and clean surfaces to receive nameplates and labels.
2. Install nameplate and label parallel to equipment lines.
3. Secure nameplate to equipment front using screws.
4. Secure nameplate to inside surface of door on recessed panelboard in finished locations.
5. Conduit Marker Spacing: 20 feet on center.
6. Identify underground conduits using one underground warning tape for each trench at 3 inches below finished grade.

D. Raceway Painting: Identify conduit using field painting in accordance with Section 09900.

E. Paint bands 20 feet on center.

1. Color:
 - a. 240 Volt System: Yellow.
 - b. Telephone System: Green.

3.4 SEALING AND FIREPROOFING

A. Fire Rated Surface:

1. Seal opening at floor, wall, ceiling' and roof as follows:
 - a. Install 12 gage steel sleeve through opening and extending beyond minimum of 1 inch on each side of building element.
 - b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
 - c. Pack void with backing material.
 - d. Seal ends of sleeve with UL listed fire resistive silicone compound to meet fire rating of structure penetrated.

B. Non-Rated Surfaces:

1. Seal opening through non-fire rated wall, floor, ceiling, and as follows:
 - a. Install 12 gage steel sleeve through opening and extending beyond minimum of 1 inch on each side of building element.

- b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
- c. Install type of firestopping material recommended by manufacturer.
2. Install escutcheons, floor plates or ceiling plates where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces include rooms with finished ceilings and where penetration occurs below finished ceiling.
3. Exterior wall openings below grade: Assemble rubber links of mechanical seal to size of conduit and tighten in place, in accordance with manufacturer's instructions.

3.5 FIELD QUALITY CONTROL

A. Section ~~01450-01451~~ - Contractor Quality Control: Testing and inspection services.

~~B. Inspect and test in accordance with NETA-ATS, except Section 4.~~

C.B. Grounding and Bonding: Perform inspections and tests listed in NETA ATS, Section 7.13.

END OF SECTION

SECTION 16121

MEDIUM-VOLTAGE CABLE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes medium voltage cable, cable terminations and sectionalizing cabinets.

1.2 REFERENCES

- A. IEEE C2 (Institute of Electrical and Electronics Engineers) - National Electrical Safety Code.
- B. IEEE 48 (Institute of Electrical and Electronics Engineers) - Test Procedures and Requirements for High- Voltage Alternating-Current Cable Terminations.
- C. NEMA WC 8 (National Electrical Manufacturers Association) - Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
- D. NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (International Electrical Testing Association).

1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit for cable, terminations, and accessories.
- C. Test Reports: Indicate results of cable test in tabular form and in plots of current versus voltage for incremental voltage steps, and current versus time at 30 second intervals at maximum voltage.
- D. Ground resistance tests for the ground rings at transformers.

1.4 CLOSEOUT SUBMITTALS

- A. Section ~~01770-01702~~ - ~~Closeout Procedures~~ As Built Records and Drawings; ~~Closeout procedures~~.
- B. Project Record Documents: Record actual sizes and locations of cables.
- C. Operation and Maintenance Data: Submit instructions for testing and cleaning cable and accessories.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with

minimum five years documented experience.

- B. Installer: Company specializing in installing Products specified in this Section with minimum three years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect cable ends from entrance of moisture.

PART 2 - PRODUCTS

2.1 MEDIUM VOLTAGE CABLE

- A. Manufacturers: BICC General Cables, Unishield, or approved equal.
- B. Product Description: NEMA WC 8, ethylene propylene rubber insulated MV-105 cable.
- C. Voltage: 15 kV, 133% insulation.
- D. Conductor: Copper, stranded, with extruded conducting stress control shield. Neutral conductor shall be full size, CU, 600 V. 15 KV cable is to have six corrugated copper drain wires embedded in an overall CPE jacket.
- E. Insulation: Ethylene propylene rubber, 220 mils thick over the conductor stress control shield.
- F. Medium voltage underground in concrete ductbank with Carlon DB60 PVC conduit.

2.2 MODULAR CABLE TERMINATION

- A. Product Description: IEEE 48, Class 1, molded-rubber cable termination in kit form with stress cone, ground clamp, non-tracking rubber skirts, 200 amp loadbreak and 600 amp non-loadbreak connector, rubber cap, and aerial lug.

PART 3 - EXECUTION

3.1 EXAMINATION

~~A. Section 01310—Administrative Requirements: Coordination and project conditions.~~

~~B.A.~~ Verify duct is ready to receive cable.

~~C.B.~~ Verify routing and termination locations of cable prior to rough-in.

3.2 PREPARATION

- A. Use swab to clean ducts before pulling cables.

3.3 INSTALLATION

- A. Avoid abrasion and other damage to cables during installation.
- B. Use suitable manufacturer approved lubricants and pulling equipment.
- C. Sustain cable pulling tensions and bending radii below manufacturer's recommended limits.
- D. Ground cable shield at each termination and splice.
- E. Hi-pot test all new cables per NEMA WC8 prior to energizing.
- F. Install sectionalizing cabinets plumb and level on concrete pad.
- G. Ground and bond sectionalizing cabinets in accordance with Section 16050. Test grounding by three point fall-of-potential method.

3.4 FIELD QUALITY CONTROL

- A. Inspect exposed cable sections for physical damage.
- B. Inspect cable for proper connections.
- C. Inspect shield grounding, cable supports, and terminations for proper installation.

~~D. Inspect and test in accordance with NETA-ATS, except Section 4.~~

~~E. Perform inspections and tests listed in NETA-ATS, Section 7.3.~~

3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Protect installed cables from entrance of moisture.

END OF SECTION

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SECTION 16123

(600 VOLTS AND LESS) WIRE AND CABLE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes building wire and cable and nonmetallic-sheathed cable (NM-B and NMC-B).

1.2 REFERENCES

- A. NECA (National Electrical Contractors Association) - Standard of Installation.
- B. NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.3 SYSTEM DESCRIPTION

- A. Product Requirements: Provide products as follows:
 - 1. Solid conductor for feeders and branch circuits 8 AWG and smaller.
 - 2. Stranded conductors for control circuits.
 - 3. Conductor not smaller than 12 AWG for power and lighting circuits.
 - 4. Conductor not smaller than 16 AWG for control circuits.
 - 5. 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet.
- B. Wiring Methods: Provide the following wiring methods:
 - 1. Concealed Dry Interior Locations: Use only building wire, Type THHN/THWN or XHHW insulation, in raceway and nonmetallic-sheathed cable (NMC).
 - 2. Exposed Dry Interior Locations: Use only building wire, Type THHN/THWN or XHHW insulation, in raceway and nonmetallic-sheathed cable (NMC).
 - 3. Above Accessible Ceilings: Use only building wire, Type THHN/THWN or XHHW insulation, in raceway and nonmetallic-sheathed cable (NMC).
 - 4. Wet or Damp Interior Locations: Use only building wire, Type THHN or XHHW insulation, in raceway.
 - 5. Exterior Locations: Use only building wire, Type THHN/THWN or XHHW insulation in raceway.
 - 6. Underground Locations: Use only building wire, Type THHN/THWN or XHHW insulation in raceway and service-entrance cable (USE).
 - 7. For service entrance, use service entrance cable (USE) only.

1.4 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit for building wire and each cable assembly type.
- C. Test Reports: Indicate procedures and values obtained.

1.5 CLOSEOUT SUBMITTALS

- A. Section ~~01770-01702 - Closeout Procedures~~ As Built Records and Drawings ~~:-Requirements for submittals.~~
- B. Project Record Documents: Record actual locations of components and circuits.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

1.7 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on Drawings.

1.8 COORDINATION

~~A. Section 01310—Administrative Requirements: Requirements for coordination.~~

~~B.A.~~ Where wire and cable destination is indicated and routing is not shown, determine routing and lengths required.

~~C.B.~~ Wire and cable routing indicated is approximate unless dimensioned.

PART 2 - PRODUCTS

2.1 BUILDING WIRE

- A. Manufacturers:
 1. American Insulated Wire Co.
 2. Diamond Wire & Cable Co.
 3. Cablec Corp.
 4. Essex Group Inc.
 5. General Cable Co.
 6. Rome.
 7. Southwire Co.~~8. Substitutions: Section 01600—Product Requirements.~~
- B. Product Description: Single conductor insulated wire.
- C. Conductor: Copper.

2.2 NONMETALLIC-SHEATHED CABLE (NM-B AND NMC-B)

- A. Manufacturers:
 1. American Insulated Wire Co.
 2. Diamond Wire & Cable Co.
 3. Cablec Corp.
 4. Essex Group Inc.
 5. General Cable Co.

6. Rome.
7. Southwire Co.
- ~~8. Substitutions: Section 01600—Product Requirements.~~

- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts.

PART 3 - EXECUTION

3.1 EXAMINATION

~~A. Section 01310—Administrative Requirements: Coordination and project conditions.~~

~~B.A.~~ Verify interior of building has been protected from weather.

~~C.B.~~ Verify mechanical work likely to damage wire and cable has been completed.

~~D.C.~~ Verify raceway installation is complete and supported.

3.2 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.

3.3 INSTALLATION

- A. Route wire and cable to meet Project conditions.
- B. Install wire and cable in accordance with NECA "Standard of Installation."
- C. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- D. Identify wire and cable under provisions of Section 16050. Identify each conductor with its circuit number or other designation indicated.
- E. Special Techniques--Building Wire in Raceway:
 1. Pull conductors into raceway at same time.
 2. Install building wire 4 AWG and larger with pulling equipment.
- F. Special Techniques - Cable:
 1. Protect exposed cable from damage.
 2. Support cables above accessible ceiling, using spring metal clips or plastic cable ties to support cables from structure [or ceiling suspension system]. Do not rest cable on ceiling panels.
 3. Use suitable cable fittings and connectors.
 4. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
 5. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
 6. Install solid conductor for feeders and branch circuits 10 AWG and smaller.
 7. Install stranded conductors for branch circuits 10 AWG and smaller. However, when

stranded conductors are used in lieu of solid, then install crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under screws.

3.4 WIRE COLOR

- A. General
 - 1. For wire sizes 10 AWG and smaller, install wire colors in accordance with the following:
 - a. Black and red for single phase circuits at 120/240 volts.
 - 2. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices and boxes. Colors are as follows:
 - a. Black and red for single phase circuits at 120/240 volts.
- B. Neutral Conductors: White. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.
- C. Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded.
- D. Feeder Circuit Conductors: Uniquely color code each phase.
- E. Ground Conductors:
 - 1. For 6 AWG and smaller: Green.
 - 2. For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.

~~3.5 FIELD QUALITY CONTROL~~

~~A. Inspect and test in accordance with NETA-ATS, except Section 4.~~

~~B. Perform inspections and tests listed in NETA-ATS, Section 7.3.1.~~

END OF SECTION

SECTION 16130

RACEWAY AND BOXES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes conduit and tubing, surface raceways, wireways, outlet boxes, pull and junction boxes, and handholes.

1.2 REFERENCES

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.
- C. NECA (National Electrical Contractor's Association) - "Standard of Installation"
- D. NEMA FB 1 (National Electrical Manufacturers Association) - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- E. NEMA OS 1 (National Electrical Manufacturers Association) - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- F. NEMA OS 2 (National Electrical Manufacturers Association) - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.
- G. NEMA RN 1 (National Electrical Manufacturers Association) - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- H. NEMA TC 2 (National Electrical Manufacturers Association) - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).
- I. NEMA TC 3 (National Electrical Manufacturers Association) - PVC Fittings for Use with Rigid PVC Conduit and Tubing.
- J. NEMA 250 (National Electrical Manufacturers Association) - Enclosures for Electrical Equipment (1000 Volts Maximum).

1.3 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. Underground More than 5 feet outside Foundation Wall: Provide thickwall nonmetallic conduit. Provide cast metal boxes or nonmetallic handhole.

- C. Underground Within 5 feet from Foundation Wall: Provide rigid steel conduit. Provide cast metal boxes.
- D. Under Slab on Grade: Provide rigid steel conduit, intermediate metal conduit and thickwall nonmetallic conduit. Provide cast or nonmetallic metal boxes.
- E. Outdoor Locations, Above Grade: Provide rigid steel conduit, intermediate metal conduit and electrical metallic tubing. Provide cast metal or nonmetallic outlet, pull, and junction boxes.
- F. Through Slab on Grade: Provide rigid steel conduit and intermediate metal conduit. Provide cast sheet metal and nonmetallic boxes.
- G. Wet and Damp Locations: Provide rigid steel conduit, intermediate metal conduit and electrical metallic tubing. Provide cast metal or nonmetallic outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.
- H. Concealed Dry Locations: Provide rigid steel conduit, intermediate metal conduit and electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pullboxes. Provide nonmetallic boxes for NMC cable.
- I. Exposed Dry Locations: Provide rigid steel conduit, intermediate metal conduit and electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pullboxes. Provide nonmetallic boxes for NMC cable.

1.4 DESIGN REQUIREMENTS

- A. Minimum Raceway Size: 1/2 inch unless otherwise specified.

1.5 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit for the following:
 - 1. Flexible metal conduit.
 - 2. Liquidtight flexible metal conduit.
 - 3. Nonmetallic conduit.
 - 4. Raceway fittings.
 - 5. Conduit bodies.
 - 6. Pull and junction boxes.
 - 7. Handholes.
- C. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.6 CLOSEOUT SUBMITTALS

- A. Section ~~01770-01702~~ – ~~Closeout Procedures~~ As Built Records and Drawings: ~~Closeout procedures~~.
- B. Project Record Documents:
 - 1. Record actual routing of conduits larger than 2 inch trade size.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

1.8 COORDINATION

~~A. Section 01310—Administrative Requirements: Coordination and project conditions.~~

~~B.A.~~ Coordinate installation of outlet boxes for equipment connected under Section 16150.

~~C.B.~~ Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.

PART 2 - PRODUCTS

2.1 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Intermediate Metal Conduit (IMC): Rigid steel.
- C. Fittings and Conduit Bodies: NEMA FB 1; all steel fittings.

2.2 FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction.
- B. Fittings: NEMA FB 1.

2.3 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction with PVC jacket.
- B. Fittings: NEMA FB 1.

2.4 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3; galvanized tubing.

- B. Fittings and Conduit Bodies: NEMA FB 1; steel or malleable iron, compression type. Set screw and indenter type are not acceptable.

2.5 NONMETALLIC CONDUIT

- A. Product Description: NEMA TC 2; Schedule 40 PVC.
- B. Fittings and Conduit Bodies: NEMA TC 3.

2.6 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch male fixture studs where required.
 - 2. Concrete Ceiling Boxes: Concrete type.
- B. Nonmetallic Outlet Boxes: NEMA OS 2.
- C. Cast Boxes: NEMA FB 1, Type FD, aluminum and cast ferrous alloy. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.
- D. Wall Plates for Finished Areas: As specified in Section 16140.
- E. Wall Plates for Unfinished Areas: Furnish gasketed cover.

2.7 PULL AND JUNCTION BOXES

- A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.
- B. Hinged Enclosures: As specified in Section 16131.
- C. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box: Material: Galvanized cast iron and cast aluminum. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.
- D. Fiberglass Concrete composite Handholes: Die -molded, glass-fiber concrete composite hand holes: Cover: Glass-fiber concrete composite, weatherproof cover with nonskid finish.
 - 1. Minimum Inside dimensions: 28 inches long x 15 inches wide x 14 inches deep, or as required by code.
 - 2. Cover Legend: "ELECTRIC", "TELEPHONE", and "CABLE TV".

PART 3 - EXECUTION

3.1 EXAMINATION

~~A. Section 01310—Administrative Requirements: Coordination and project conditions.~~

B.A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 INSTALLATION

- A. Install raceway and boxes in accordance with NECA "Standard of Installation."
- B. Ground and bond raceway and boxes in accordance with Section 16050.
- C. Fasten raceway and box supports to structure and finishes in accordance with Section 16050.
- D. Identify raceway and boxes in accordance with Section 16050.
- E. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.3 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.
- B. Install nonmetallic conduit.
- C. Arrange raceway supports to prevent misalignment during wiring installation.
- D. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- E. Group related raceway; support using conduit rack. Construct rack using steel channel specified in Section 16050.
- F. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
- G. Do not attach raceway to ceiling support wires or other piping systems.
- H. Construct wireway supports from steel channel specified in Section 16050.
- I. Route exposed raceway parallel and perpendicular to walls.
- J. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
- K. Route conduit under slab from point-to-point.
- L. Conduit in Slab not permitted.
- M. Maintain clearance between raceway and piping for maintenance purposes.
- N. Maintain 12 inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
- O. Cut conduit square using saw or pipecutter; de-burr cut ends.

- P. Bring conduit to shoulder of fittings; fasten securely.
- Q. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- R. Install conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations.
- S. Install no more than equivalent of three 90 degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2 inch size.
- T. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- U. Install fittings to accommodate expansion and deflection where raceway crosses control and expansion joints.
- V. Install suitable pull string or cord in each empty raceway except sleeves and nipples.
- W. Install suitable caps to protect installed conduit against entrance of dirt and moisture.
- X. Close ends and unused openings in wireway.

3.4 INSTALLATION - BOXES

- A. Install wall mounted boxes at elevations to accommodate mounting heights specified in section for outlet device.
- B. Adjust box location up to 10 feet prior to rough-in to accommodate intended purpose.
- C. Orient boxes to accommodate wiring devices oriented as specified in Section 16140.
- D. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- E. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- F. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- G. Do not install flush mounting box back-to-back in walls; install with minimum 6 inches separation. Install with minimum 24 inches separation in acoustic rated walls.
- H. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- I. Install stamped steel bridges to fasten flush mounting outlet box between studs.
- J. Install nonmetallic boxes on wood studs.

- K. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- L. Install adjustable steel channel fasteners for hung ceiling outlet box.
- M. Do not fasten boxes to ceiling support wires or other piping systems.
- N. Support boxes independently of conduit.
- O. Install gang box where more than one device is mounted together. Do not use sectional box.
- P. Install gang box with plaster ring for single device outlets.

3.5 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods in accordance with Section 16050.
- B. Locate outlet boxes to allow luminaires positioned as indicated on Drawings.
- C. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.6 ADJUSTING

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closures in unused openings in boxes.

3.7 CLEANING

~~A. Section 01770 — Closeout Procedures: Final cleaning.~~

~~B.A.~~ Clean interior of boxes to remove dust, debris, and other material.

~~C.B.~~ Clean exposed surfaces and restore finish.

END OF SECTION

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SECTION 16140

WIRING DEVICES GENERAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes wall switches; receptacles; and device plates.

1.2 REFERENCES

- A. NECA (National Electrical Contractors Association) - Standard of Installation.
- B. NEMA WD 1 (National Electrical Manufacturers Association) - General Requirements for Wiring Devices.
- C. NEMA WD 6 (National Electrical Manufacturers Association) - Wiring Device -- Dimensional Requirements.

1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit manufacturer's catalog information showing dimensions, colors, and configurations.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.5 EXTRA MATERIALS

~~A. Section 01700 - Execution Requirements: Spare parts and maintenance products.~~

B.A. Furnish two of each style, size, and finish wall plate.

PART 2 - PRODUCTS

2.1 WALL SWITCHES

- A. Manufacturers:
 1. Arrow Hart.
 2. Bryant.
 3. GE.
 4. Hubbell.
 5. Leviton.
 6. Pass & Seymour.
 7. Substitutions: Not Permitted.

- B. Product Description: NEMA WD 1, Specification grade, AC only general-use snap switch.
- C. Body and Handle: Ivory plastic with toggle handle.
- D. Ratings:
 - 1. Voltage: 120-277 volts, AC.
 - 2. Current: 20 amperes.

2.2 RECEPTACLES

- A. Manufacturers:
 - 1. Arrow Hart.
 - 2. Bryant.
 - 3. GE.
 - 4. Hubbell.
 - 5. Leviton.
 - 6. Pass & Seymour.
 - 7. Substitutions: Not permitted.
- B. Product Description: NEMA WD 1, Specification grade general use receptacle.
- C. Device Body: Ivory plastic.
- D. Configuration: NEMA WD 6, type as indicated on Drawings.
- E. Convenience Receptacle: Type 5-20.
- F. GFCI Receptacle: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.

2.3 WALL PLATES

- A. Manufacturers:
 - 1. Arrow Hart.
 - 2. Bryant.
 - 3. GE.
 - 4. Hubbell.
 - 5. Leviton.
 - 6. Pass & Seymour.
 - 7. Substitutions: Not permitted.
- B. Decorative Cover Plate: Ivory, nylon.
- C. Weatherproof Cover Plate: Gasketed cast metal plate, white color finish with threaded and gasketed device cover.

PART 3 - EXECUTION

3.1 EXAMINATION

~~A. Section 01310—Administrative Requirements: Coordination and project conditions.~~

~~B.A.~~ Verify outlet boxes are installed at proper height.

~~C.B.~~ Verify wall openings are neatly cut and completely covered by wall plates.

~~D.C.~~ Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.2 PREPARATION

A. Clean debris from outlet boxes.

3.3 INSTALLATION

A. Install in accordance with NECA "Standard of Installation."

B. Install devices plumb and level.

C. Install switches with OFF position down.

D. Install 3- and 4- way switches so that the circuit is off when all switch handles are in the down position.

E. Install receptacles with grounding pole on bottom.

F. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.

G. Install decorative plates on switch, receptacle, and blank outlets in finished areas.

H. Connect wiring devices by wrapping solid conductor around screw terminal. Install stranded conductor for branch circuits 10 AWG and smaller. When stranded conductors are used in lieu of solid, use crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under device screws.

I. Use jumbo size plates for outlets installed in masonry walls.

J. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

3.4 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes provided under Section 16130 to obtain mounting heights as specified and as indicated on drawings.

B. Install wall switch 44 inches above finished floor.

C. Install convenience receptacle 15 inches above finished floor.

- D. Install convenience receptacle 6 inches on center above backsplash.

3.5 FIELD QUALITY CONTROL

- A. Inspect each wiring device for defects.
- B. Operate each wall switch with circuit energized and verify proper operation.
- C. Verify each receptacle device is energized.
- D. Test each receptacle device for proper polarity.
- E. Test each GFCI receptacle device for proper operation.

3.6 ADJUSTING

- A. Adjust devices and wall plates to be flush and level.

3.7 CLEANING

~~A. Section 01770—Closeout Procedures: Final cleaning.~~

B.A. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

SECTION 16150

WIRING CONNECTIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes electrical connections to equipment.

1.2 REFERENCES

- A. NEMA WD 1 (National Electrical Protection Association) - General Purpose Wiring Devices.
- B. NEMA WD 6 (National Electrical Protection Association) - Wiring Devices - Dimensional Requirements.

1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit wiring device manufacturer's catalog information showing dimensions, configurations, and construction.
- C. Manufacturer's installation instructions.

1.4 CLOSEOUT SUBMITTALS

- A. Section ~~01770-01702~~ - ~~Closeout Procedures~~ As Built Records and Drawings - ~~Submittal procedures~~.
- B. Project Record Documents: Record actual locations, sizes, and configurations of equipment connections.

1.5 COORDINATION

~~A. Section 01310—Administrative Requirements: Coordination and project conditions.~~

~~B.A.~~ Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.

~~C.B.~~ Determine connection locations and requirements.

~~D.C.~~ Sequence rough-in of electrical connections to coordinate with installation of equipment.

~~E.D.~~ Sequence electrical connections to coordinate with start-up of equipment.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 EXAMINATION

~~A. Section 01310—Administrative Requirements: Coordination and project conditions.~~

B.A. Verify equipment is ready for electrical connection, for wiring, and to be energized.

3.2 INSTALLATION

- A. Make electrical connections.
- B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
- C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
- D. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
- E. Install terminal block jumpers to complete equipment wiring requirements.
- F. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

3.3 ADJUSTING

- A. Cooperate with utilization equipment installers and field service personnel during checkout and starting of equipment to allow testing and balancing and other startup operations. Provide personnel to operate electrical system and checkout wiring connection components and configurations.

END OF SECTION

SECTION 16210

ELECTRICAL UTILITY SERVICES GENERAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes connection of electric service to each housing unit from pad mounted transformers.

1.2 SYSTEM DESCRIPTION

- A. The medium voltage distribution system is owned by Malmstrom AFB for Matador site.
- B. The medium voltage distribution system, including street lighting system, for Minuteman Site is owned by Northwestern Energy. Point of connection (POC) should be at the meter base.
- C. System Characteristics: 120/240 volts, single phase, three-wire, 60 Hertz.
- D. Service Entrance: Underground.
- E. Underground Service Provisions: Underground service entrance to building service entrance equipment.
 - 1. Matador Site: All primary and secondary work including pad mounted transformer and underground service-entrance conductor shall be by contractor.
 - 2. Minuteman Site: All primary and secondary work including pad mounted transformer and underground service-entrance conductor shall be by Northwestern Energy. Point of connection is the meter base.

1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.

~~B. Submit Utility Company prepared drawings.~~

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with Malmstrom AFB written requirements and these specifications.
- B. Maintain one copy of each document on site.

1.5 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on Drawings.

PART 2 - PRODUCTS

2.1 UTILITY METERS

- A. Not required.

2.2 UTILITY METER BASE

- A. Product Description: Combination meter base and main circuit breaker rated 200 amperes per Malmstrom AFB requirements for Matador site and POC for Minuteman Site.
 - 1. UL listed as service entrance equipment.
 - 2. Equipped with neutral bus, ground bus and ground jumper.
 - 3. Provide with meter jumper bars and socket cover.
 - 4. Provide dual units as shown on drawings.

2.3 TRANSFORMER PADS

- A. Product Description: Cast-in-place concrete and Precast concrete pad sized as indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

~~A. Section 01310—Administrative Requirements: Coordination and project conditions.~~

B.A. Verify service equipment is ready to be connected and energized.

3.2 INSTALLATION

- A. Install cast-in-place concrete pad for transformer, in accordance with Section 03300.

END OF SECTION

SECTION 16271

PAD-MOUNTED TRANSFORMERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes liquid-filled pad-mounted distribution transformers for Matador site only.

1.2 REFERENCES

- A. ANSI C37.47 - Specifications for Distribution Fuse Disconnecting Switches, Fuse Supports, and Current-Limiting Fuses.
- B. ANSI C57.12.26 - Pad-Mounted Compartmental-Type, Self-Cooled, Three-Phase Distribution Transformers for Use with Separable Insulated High-Voltage Connectors, High Voltage 34 500 Grd Y/19 920 Volts and Below; 2500 kVA and Smaller.
- C. ANSI C57.12.28 - Switchgear and Transformers--Pad-Mounted Equipment--Enclosure Integrity.
- D. IEEE C57.12.00 (Institute of Electrical and Electronics Engineers) - General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers.
- E. IEEE C57.12.90 (Institute of Electrical and Electronics Engineers) - Test Code for Liquid-Immersed Distribution Power, and Regulating Transformers and Guide for Short-Circuit Testing of Distribution and Power Transformers.
- F. IEEE C57.13 (Institute of Electrical and Electronics Engineers) - Requirements for Instrument Transformers.
- G. IEEE C57.106 (Institute of Electrical and Electronics Engineers) - Guide for Acceptance and Maintenance of Insulating Oil in Equipment.
- H. IEEE 386 (Institute of Electrical and Electronics Engineers) - Separable Insulated Connector Systems for Power Distribution Systems Above 600 V.
- I. NEMA 260 (National Electrical Manufacturers Association) - Safety Labels for Padmounted Switchgear and Transformers Sited in Public Areas.
- J. NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment.

1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.

- B. Shop Drawings: Indicate electrical characteristics and connection requirements, outline dimensions, connection and support points, weight, specified ratings and materials.
- C. Product Data: Submit electrical characteristics and connection requirements, standard model design tests, and options.
- D. Test Reports: Indicate procedures and results for specified factory and field testing and inspection.
- E. Manufacturer's Field Reports: Indicate activities on site, adverse findings, and recommendations.

1.4 CLOSEOUT SUBMITTALS

- A. Section ~~01770-01702~~ ~~—Closeout Procedures~~ As Built Record and Drawings: ~~Closeout procedures~~.
- B. Project Record Documents: Include copy of manufacturer's certified drawings.
- C. Operation and Maintenance Data: Submit maintenance procedures for sampling and maintaining fluid.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years experience.
- B. Testing Agency: Company [member of International Electrical Testing Association and] specializing in testing products specified in this section with minimum three years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01501 – Construction Facilities and Temporary Controls: Product storage and handling, storing, and protecting products.

1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.8 MAINTENANCE MATERIALS

- A. Furnish two each of special tools required to operate and maintain transformer.

1.9 EXTRA MATERIALS

- A. Furnish two sets of each size and type fuse.

PART 2 - PRODUCTS

2.1 LIQUID-FILLED TRANSFORMERS

- A. Product Description: ANSI C57.12.26, single phase, pad mounted, residential application, dead front construction, self-cooled transformer unit.
- B. Cooling and Temperature Rise; IEEE C57.12.00; Class OA. 65 degrees C, self-cooled.
- C. Insulating Liquid: Oil conforming to IEEE C57.106.

2.2 SERVICE CONDITIONS

- A. Meet requirements for usual service conditions described in IEEE C57.12.00

2.3 RATINGS

- A. Capacity: As shown on drawings.
- B. Primary Voltage: 7.2 kV Line-Neutral connected.
- C. Taps: Standard primary taps.
- D. Secondary Voltage: 240/120 volts, single phase.
- E. Impedance: 1.8 percent minimum.
- F. Basic Impulse Level: 95 kV.

2.4 ACCESSORIES

- A. Accessories: IEEE C57.12.00, standard accessories and the following:
 - 1. Oil drain.
 - 2. Filler and level plugs with automatic pressure relief device.
- B. Tap Changer: Externally-operated type.
- C. Primary Terminations: Bushing wells conforming to IEEE 386; furnish two for loop feed. Include bushings for insulated loadbreak connectors.
- D. Primary Overcurrent Protection: Canister-type current-limiting fuses to conforming to ANSI C37.47, sized at 150% of full load current.
- E. Secondary Terminations: Spade lugs.
- F. Other Accessories: Primary lightning arrestors.

2.5 FABRICATION

- A. Conform to requirements of ANSI C57.12.28.

2.6 FACTORY FINISHING

- A. Clean surfaces before applying paint.
- B. Apply corrosion-resisting primer to surfaces.
- C. Apply finish coat of baked enamel stencil to 4 mils thick.
- D. Finish Color: Dark brown, Federal Spec #37056.

2.7 SOURCE QUALITY CONTROL (AND TESTS)

- A. Provide factory tests conforming to IEEE C57.12.90. Include routine tests as defined in IEEE C57.12.00 and the following other tests:
 - 1. Impedance voltage and load loss.
 - 2. Dielectric tests.
 - 3. Audible sound level.
 - 4. Short circuit capability.
 - 5. Telephone influence factor (TIF).
- B. Test insulating liquid samples in accordance with IEEE C57.106.

~~C. Make completed transformer available for inspection at manufacturer's factory prior to packaging for shipment. Notify Contracting Officer at least seven days before inspection is allowed.~~

~~D. Allow witnessing of factory inspections and tests at manufacturer's test facility. Notify Contracting Officer at least seven days before inspections and tests are scheduled.~~

PART 3 -- EXECUTION

3.1 EXAMINATION

~~A. Section 01310 -- Administrative Requirements: Coordination and project conditions.~~

B.A. Verify pads and supports are suitable for installation.

3.2 INSTALLATION

- A. Install plumb and level on concrete pad.
- B. Install safety labels in accordance with NEMA 260.
- C. Install engraved plastic nameplates in accordance with Section 16050.
- D. Ground and bond transformer in accordance with Section 16050. Test grounding by three point fall-of-potential method.

3.3 FIELD QUALITY CONTROL

- A. Section ~~01450~~ 01451 -- Contractor Quality Control: Testing and inspection services.

- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.2. Include the following optional tests:
 - 1. Power factor or dissipation-factor tests.
 - 2. Winding-resistance tests for each winding at final tap setting.
 - 3. Individual excitation current tests on each phase.
 - 4. Insulating liquid specific gravity, power factor, water content, dissolved gas, and total combustible gas.
 - 5. Operational test and adjustments on fan and pump controls and alarm functions.
 - 6. Percent oxygen test on nitrogen gas blanket.

3.4 ADJUSTING

- A. Adjust primary taps so secondary voltage is within 2 percent of rated voltage.

END OF SECTION

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SECTION 16442

LOAD CENTERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section is for branch circuit load centers.

1.2 REFERENCES

- A. NECA (National Electrical Contractors Association) -Standard of Installation
- B. NEMA AB 1 (National Electrical Manufacturers Association) - Molded Case Circuit Breakers.
- C. NEMA PB 1 (National Electrical Manufacturers Association) – Load Centers.
- D. NEMA PB 1.1 (National Electrical Manufacturers Association) - Instructions for Safe Installation, Operation and Maintenance of Load Centers Rated 600 Volts or Less.
- E. NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems

1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.
- C. Product Data: Submit catalog data showing specified features of standard products.

1.4 CLOSEOUT SUBMITTALS

- A. Section ~~01780-01702 - Closeout Submittals~~ As Built Records and Drawings: Requirements for submittals.
- B. Project Record Documents: Record actual locations of load centers and record actual circuiting arrangements.
- C. Operation and Maintenance Data: Submit spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years experience.

1.6 MAINTENANCE MATERIALS

- A. Furnish two of each load center key. Load centers keyed alike to Government's current keying system.

PART 2 - PRODUCTS

2.1 LOAD CENTERS

- A. Product Description: Dead front safety type load center, with bus ratings as indicated on Drawings.
- B. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical.
- C. Molded Case Circuit Breakers: Snapin, quick make, quick break circuit breakers with toggle handles that indicated when tripped. NEMA AB 1, plug-on type thermal magnetic trip circuit breakers, with common trip handle for poles, listed as Type SWD for lighting circuits, Class A ground fault interrupter circuit breakers as indicated on Drawings. Do not use tandem circuit breakers.
- D. Enclosure: General Purpose.
- E. Box: Flush or Surface type as shown on drawings with door, and lock on door. Finish in manufacturer's standard gray enamel.
- F. Bus: Copper.
- G. Neutral at full size.
- H. Engraved phenolic label on the exterior door.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install load centers in accordance with NEMA PB 1.1 and NECA "Standard of Installation."
- B. Install and load centers plumb.
- C. Install recessed load centers flush with wall finishes.
- D. Height: 6 feet to top of load center.
- E. Install filler plates for unused spaces in load centers.
- F. Provide typed circuit directory for each branch circuit load center. Revise directory to reflect circuiting changes to balance phase loads.
- G. Install engraved plastic nameplates in accordance with Section 16050.

- H. Ground and bond load center enclosure according to Section 16050. Connect equipment ground bars of panels in accordance with NEC Article 517.

3.2 FIELD QUALITY CONTROL

- A. Section ~~01450-01451~~ — Contractor Quality Control: Testing and Inspection Services.

~~B. Inspect and test in accordance with NETA-ATS, except Section 4.~~

~~C. Perform circuit breaker inspections and tests listed in NETA-ATS, Section 7.6.~~

~~D. Perform switch inspections and tests listed in NETA-ATS, Section 7.5.~~

~~E. Perform controller inspections and tests listed in NETA-ATS, Section 7.16.1.~~

3.3 ADJUSTING

- A. Measure steady state load currents at each load center feeder; rearrange circuits in load centers to balance phase loads to within 20 percent of each other.

END OF SECTION

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SECTION 16722

RESIDENTIAL SMOKE AND CARBON MONOXIDE/GAS DETECTORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes residential smoke detectors that are to be installed in sleeping rooms, corridors and living areas.
- B. Section includes residential carbon monoxide and explosive gas detectors to be installed near the furnace and on all floor levels.

1.2 REFERENCES

- A. National Fire Protection Association (NFPA) - NFPA 70, National Electrical Code (NEC), 1999 Edition.
- B. National Fire Protection Association (NFPA) - NFPA 72, National Fire Alarm Code, 1999 Edition.
- C. Underwriters Laboratories (UL) – UL 3124, Single and Multiple Station Carbon Monoxide Alarms.

1.3 SYSTEM DESCRIPTION

- A. Single station smoke detectors shall be hardwired to 120 VAC circuits and looped together such that any detector in alarm shall cause all detectors to signal an alarm. The detectors shall be photoelectric style and located as indicated in the contract documents.
- B. Single station carbon monoxide detectors shall be hardwired to 120 VAC circuits and located as indicated in the contract documents.

1.4 SUBMITTALS

- A. Comply with requirements of Section 01330 – Submittal Procedures.
- B. Product Data: Submit catalog data for each type detector.

1.5 CLOSEOUT SUBMITTALS

- A. Comply with requirements of Section ~~01780-01702 – Closeout Submittals~~ As Built Records and Drawings.
- B. Project Record Documents: Record and submit actual detector locations and circuits wired to.

PART 2 - PRODUCTS

2.1 DETECTORS

- A. Smoke detectors shall be hardwired to a 120VAC dedicated circuit. Detectors shall be capable of interconnecting with a minimum 18 similar devices by interconnecting wiring. When interconnected with additional devices, all units shall sound an alarm upon activation of any single detector. Detector shall provide visible indication that the device is active and which device is in alarm and be equipped with a test button.
 - 1. Acceptable manufacturer is American Personal Security.
 - 2. Or approved equivalent.

- B. Carbon monoxide detector shall be a combination carbon monoxide and explosive gas detector with a digital readout and 85-dB horn output and have hard wire capability.
 - 1. Acceptable manufacturer is American Sensor.
 - 2. Or approved equivalent.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Detectors shall have a dedicated 120V circuit.

- B. Smoke detectors shall have interconnecting wiring to interconnect all devices. All devices sound on any single alarm. Install all devices and wire according to manufacturer's recommendations.

- C. Carbon monoxide explosive gas detector shall be hard wired to a 120V circuit and located in an easily accessible and visible location.

3.2 TESTS

- A. System hookup and test is to be accomplished by the contractor in the presence of the Base Fire Marshall. The contractor shall furnish a letter to the contracting officer certifying that the system is installed properly and is complete and operating as specified and the Base Fire Marshall has approved testing.

END OF SECTION

FY03 REPLACE FAMILY HOUSING

PHASE 6A

MALMSTROM AFB, MONTANA

Pre-proposal Site Visit & Conference

6 February 2003

DACA67-03-R-0207

TRANSCRIPT OF PROCEEDINGS

Great Falls, Montana

Thursday, February 6, 2003

8:30 - 10:05 A.M.

1 MR. NAKAMOTO: Good morning, everyone. This is
 2 the Replace Family Housing at Malmstrom Air Force Base
 3 Phase 6A site visit and presentation. I just want to let
 4 you people in on the agenda for this morning. We're going
 5 to visit the Matador Manor site first. We're going to
 6 spend about 15 minutes there and give you a chance to look
 7 around in whatever snow condition you can find. And then
 8 we're going to head to Minuteman Village and spend about
 9 15 minutes there. And from there we're going to go to the
 10 Education Center, Room 101, and the contracting officer is
 11 going to make a presentation on the evaluation and
 12 criteria for the selection.

13 So at that time we'll give you a handout and you
 14 can take notes, but I caution you that while you're at the
 15 sites that you are not to speak to any government
 16 employees. You can speak among yourselves. If you have
 17 any questions, write it down and we'll take up questions
 18 during the presentation and will answer the question for
 19 what we can, and if not, we're going to ask you to send it
 20 into tech bid and we'll answer it at that time.

21 I'm going to pass around an attendance sheet and
 22 it will also be in the transcript and that transcript is
 23 going to be released 12 February. Okay? All right.

24 (Whereupon, site visitations took place.)

25 (Whereupon, the following proceedings were had

1 in the Education Center, Room 101.)

2 MR. NAKAMOTO: This is the continuation of the
 3 Replace Family Housing at Malmstrom Air Force Base Phase
 4 6A. This portion is the briefing for the evaluation
 5 criteria. What we'll show you on the slide actually is
 6 reproduced in your handout. So if you want to write notes
 7 on it to refer to back later, you can do that. If you
 8 have any questions, you can call -- any technical
 9 questions can be called into the tech bid system through
 10 our website and the phone number on this illustration.

11 If you have any questions that you came across
 12 during the site visit this morning, you can present it at
 13 this time and we'll read it out loud so that the benefit
 14 to everyone can be heard. I'll try to answer all
 15 questions right now. Technical questions, we may have to
 16 take you back and place it in the tech bid as I said
 17 earlier.

18 I'm going to have everybody introduce themselves
 19 with your firm affiliations, if you would, I would
 20 appreciate it. You all will get an attendance list in a
 21 transcript form along with the proceedings today and it
 22 will be published with an amendment that may come through
 23 to questions or things that we have since generated from
 24 tech bid information that came through.

25 I'm Jim Nakamoto, I'm the project manager. I'm

1 based out of Seattle working at district office. Tom
 2 DeBonia is the contract specialist, he will present the
 3 presentation. So if you can start with this person, we'll
 4 go around the room. Maybe we'll start with this person
 5 and go back around there and come back. And if you have a
 6 difficult name, I would appreciate it if you can spell it
 7 for our court reporter and don't forget the firm
 8 affiliation. Thank you.

9 MR. KORSLIEN: I'm Alan Korslien,
 10 K-O-R-S-L-I-E-N, and I'm the lead engineer for the Corps
 11 project office on the base.

12 MR. GAMBLE: Jack Gamble, base project manager
 13 here on Malmstrom.

14 MS. BLACK: I'm Robin Black with RSCI, we're a
 15 general contractor out of Idaho.

16 MR. SKAWINSKI: I'm Rob Skawinski,
 17 S-K-A-W-I-N-S-K-I, with United Materials.

18 MR. WITHAM: Mark Witham, W-I-T-H-A-M, with
 19 Liberty Electric.

20 MR. CALDWELL: I'm Gordon Caldwell with Swank
 21 Enterprises, quality control superintendent.

22 MR. LARONDE: Kevin LaRonde with Williamson
 23 Fence, estimator.

24 MR. YUREK: Dale Yurek of Williamson Fence, vice
 25 president.

1 MR. TILLERAAS: Steve Tillerias, Tillerias
 2 Landscape & Nursery.

3 MR. PETZAK: Mike Petzak, P-E-T-Z-A-K, Oswood
 4 Construction.

5 MR. GERANIOS: Nick Geranios, G-E-R-A-N-I-O-S.
 6 M & D Construction.

7 MR. VINING: Kevin Vining, Forde Nursery and
 8 Landscaping.

9 MR. KIRKPATRICK: Mike Kirkpatrick, Falls
 10 Construction, Great Falls.

11 MR. COMISH: Chris Comish, Shaw Beneco, general
 12 contractor.

13 MR. OSWOOD: Brian Oswood, BGO Builders, Great
 14 Falls.

15 MR. WALD: Tom Wald, Central Floor Covering,
 16 Great Falls.

17 MR. NAKAMOTO: Thank you very much.

18 MR. DEGONIA: And I'm Tom DeGonia. In addition
 19 to -- Jim is going to send out the minutes of this
 20 meeting. They will also be posted to the Internet as an
 21 amendment to the solicitation. And I can't overemphasize
 22 the amendments, make sure you take a look at them because
 23 things -- every time something changes with the contract,
 24 it will be posted by an amendment.

25 I would like to welcome you on behalf of the

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1 contracting work force at Seattle District. Today we'll
2 be talking about this project for the housing here at
3 Malmstrom. This is a request for proposal, RFP. It is
4 not an IFB. The meetings of this, as I said already, the
5 meeting minutes, the court reporter is taking minutes and
6 they will be posted to the Internet site in the form of an
7 amendment.

8 Comments, clarifications made will be -- will
9 not change this solicitation of the ones that are made
10 today. You submit your -- write up your questions and
11 submit them and we will get an answer for you and will be
12 posted as part of the tech bid process. If you have any
13 questions on clarification during your process of
14 preparing your bid, make sure that you e-mail it to our
15 tech bid e-mail address.

16 Today's attendance list where you folks have
17 signed in, that will be posted as well as an amendment to
18 this solicitation so you all know who was here and so will
19 the whole world. Our contracting website where you can
20 find the solicitation, this is the e-mail -- or the
21 website for us, www.nws.usace.army.mil. That is where you
22 can go to download the solicitation, the specifications,
23 the drawings and all the amendments. And, again, I can't
24 overemphasize looking at this thing at least once every
25 day or two because amendments come out very quick. For

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1 example, this one already has one amendment to it.

2 Your technical questions you submit to
3 techbid@nws02.usace.army.mil. Any administrative
4 questions, this is my e-mail address. I'll try and answer
5 any questions. If I can't answer it, I'll see to it that
6 it gets to the person who can. Got a lot of experts
7 there. My phone number, and please feel free, if you're
8 having any kind of problems getting through our website,
9 please feel free to give me a call, I'll be more than
10 happy to walk through it with you, so don't hesitate to
11 give me a call.

12 This project consists of constructing 18 units
13 and a duplex configuration, eight units, four buildings at
14 the Minuteman Village and ten units, five buildings at the
15 Matador Manor neighborhood. Both sides will include
16 access road in a cul-de-sac design and underground
17 utilities and infrastructure. The housing components
18 consist of two-story design with no basement. The design
19 will be similar to the existing houses with aluminum
20 siding in a two-pattern design, composition roof,
21 insulated windows, some units with window shutters,
22 carpeting, vinyl floor, porcelain floor tile, single car
23 garage, landscaping and yard fences. You'll also find
24 this same description in Section 110 of the solicitation
25 in the first paragraph.

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1 MR. KORSLEIN: Steel siding.

2 MR. DEGONIA: Okay, steel siding. Let me make a
3 note of that because I took that off -- guess what, we got
4 an amendment coming out.

5 MR. KORSLEIN: The spec indicates steel.

6 MR. DEGONIA: This is in the 110. As I already
7 stated, this project is a request for a proposal. It
8 requires the submission of a technical and a price
9 proposal. Look at Section 110, it will tell you all about
10 the formats and what we're looking for in the form of your
11 proposal. The technical and price proposal are required
12 to be submitted to the Corps of Engineers, Seattle
13 District, by 2:00 p.m. on February 26th. Originally when
14 it came out it was the 27th. But the first amendment came
15 out the day that we released it to change it to the 26th.
16 There was a typo, I got my fat finger in the way. No
17 offer will be accepted after that time and date.

18 You'll have a standard Form 1442 solicitation,
19 offer and award. And there are certain things that are
20 required on there that you complete and return with the
21 submittal. You have to ensure that all your amendments
22 are acknowledged and your corporate certificates are
23 completed and noted in the 1442. The government intends
24 to make award based on the lowest priced, technically
25 acceptable offer. So you're going to have a technical

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1 review before we ever get to the price.

2 MR. OSWOOD: Tom?

3 MR. DEGONIA: Yes.

4 MR. OSWOOD: On Page 2 of that standard Form
5 1442 it says values. Usually there's something in there
6 that states that see bid schedule or see schedule of
7 values. I notice on this form it's completely blank. Do
8 we -- can we just handwrite in see bid schedule for those
9 values, Tom?

10 MR. DEGONIA: I'll let you know in just a
11 moment. Let me look at what you're talking about. Which
12 page?

13 MR. OSWOOD: It's on Page 2. Or on the back of
14 that Form 1442.

15 MR. DEGONIA: You're talking about block 17,
16 right?

17 MR. OSWOOD: Right.

18 MR. DEGONIA: I will reply in the amendment.

19 MR. OSWOOD: Okay. Thank you.

20 MR. DEGONIA: Okay. For the purposes of this
21 project, a firm is considered a large business if the
22 average annual receipts exceed \$28.5 million. If you are
23 considered as a large business, then you must submit a
24 subcontracting plan with the offer. If you're a large
25 business, you do not submit the subcontracting plan as

1 far as the evaluation, then you're automatically
 2 eliminated.

3 The contract will be to award to the firm
 4 submitting the lowest priced, technically acceptable
 5 offer. And I can't overemphasize that. Proposal
 6 preparation costs will not be paid by the government,
 7 that's part of doing business. Debriefings may be
 8 requested in accordance with the FAR 15.505 and 15.506.
 9 The FAR stands for Federal Acquisition Regulation for
 10 anybody who doesn't know.

11 Pre-award debriefing, I don't think we're going
 12 to have any pre-award debriefings. But in the case that
 13 you do, all offerors excluded before award must submit
 14 request to contracting within three calendar days after
 15 offeror receives notice of exclusion from the competition.
 16 I haven't had anybody been excluded on an acceptable,
 17 non-acceptable basis so far. Post-award debriefing, any
 18 unsuccessful offeror who has not had a pre-award
 19 debriefing must submit request to contracting within three
 20 days after the notation of contract award is received.

21 Now, we will be more than happy to debrief you
 22 and tell you what was wrong with your offer. We will not
 23 tell you where you ranked as far as the other people
 24 submitting offers. We will not tell you anything about
 25 anybody else. This will be strictly on your proposal.

1 Now, in Section 110 of the solicitation, it
 2 provides the technical evaluation criteria as well as the
 3 evaluation of and award procedures. The technical
 4 evaluation criteria are, relevant experience, this is of
 5 the prime firm, their relevant experience. In order to
 6 evaluate the prime firm's experience, we need to have
 7 three projects submitted, one of which is in a climate
 8 similar to here at Malmstrom. That is not for contract.
 9 And we need this described in your technical evaluation.
 10 This is one of the items that will be evaluated. We'll go
 11 out and contact the people.

12 Qualifications of key team members. And these
 13 are the key team members who are going to be working on
 14 the project. That would be your project superintendent.
 15 Now, this is spelled out in Section 110. Please read it
 16 so that you know what the criteria are for the project
 17 superintendent. Your project manager, once again, read
 18 the criteria, see what it's calling for. Your CQC systems
 19 manager, please read that. There are requirements within
 20 these descriptions which you must comply with.

21 A matter of fact, recently we had one of the
 22 people did not read it apparently because they didn't
 23 submit the proper information, so as a result there were a
 24 number of firms that were eliminated that could have been
 25 in the running. And past performance. Now, past

1 performance we get two ways. One, I go out to CQC and
 2 download it and, two, we have a customer satisfaction
 3 survey which is included in the Section 110 which you sent
 4 out to your customers if you don't have any information in
 5 CQC. And they need to submit it to us prior to the
 6 solicitation closing dates.

7 Read the descriptions of evaluation -- let me
 8 try that again. Read the descriptions of the evaluation
 9 criteria thoroughly. For example, in a CQC system
 10 manager, there are certain things in there that they have
 11 to do. It references other places within the contract
 12 which will provide information. Please make sure you read
 13 it. I don't want to see anybody eliminated for not
 14 reading it.

15 Ensure the proposal is complete and reflects all
 16 elements required by the solicitation to at least meet the
 17 minimum criteria. We're not asking for the -- we don't
 18 have a maximum criteria, we have a minimum criteria so
 19 that we can get everybody qualified. The technical
 20 proposals are evaluated on their own merit and against the
 21 evaluation criteria only, not against other proposals. So
 22 what you submit to us, I mentioned a moment ago what the
 23 technical -- or what the technical evaluation consisted
 24 of, which is past performance, your key people, and your
 25 customer satisfaction.

1 Proposals submitted in two parts. As I have
 2 already stated, you'll have a technical and you will have
 3 a price proposal. Each of those have a specific format
 4 that's spelled out in Section 110. The technical
 5 evaluation ratings, the definitions, there are going to be
 6 two ratings used, acceptable, nonacceptable. You have to
 7 meet the minimum criteria, otherwise, it's not
 8 acceptable. Everybody who meets the minimum criteria is
 9 acceptable.

10 There's also more detailed information in
 11 Section 110. If you missed any part of that, you can be
 12 eliminated for one item in there. Acceptable. An
 13 acceptable rating indicate that the offeror has provided
 14 sufficient information to meet the minimum qualifications,
 15 standards described in the technical evaluation factor.
 16 Not acceptable, it's just the opposite. A nonacceptable
 17 rating indicates that the offeror has not provided
 18 sufficient information to meet the minimum qualifications
 19 described in the technical evaluation factors.

20 So when you go into Section 110 of the
 21 solicitation, please, I can't over emphasize enough,
 22 please read very carefully and comply with what it says.
 23 Make sure that you check the amendments to the
 24 solicitation so that you have all of the information that
 25 is out on that website and all the information that

1 pertains to this solicitation. Your price will be
 2 evaluated for reasonableness and to assess the offeror's
 3 understanding of the contract requirements and any risk
 4 inherent in the offeror's approach.

5 So we will be looking at after you are
 6 technically qualified. If you are not technically
 7 qualified, we won't get that far. So make sure that your
 8 price -- when you submit your price proposal, that you
 9 understand what that price proposal is asking and we want
 10 to make sure that -- we don't want to have ten people bid
 11 a hundred dollars and one bid \$40. There's something
 12 wrong there. So make sure you understand this. Matter of
 13 fact, we would probably go out to the \$40 guy and say,
 14 hey, we don't think you understood that.

15 Financial capacity and bonding ability will be
 16 checked. So we will go out to your bank and check on it.
 17 It is the intent of the government to make an award based
 18 upon initial offerors without further discussion or
 19 additional information. So this -- what you will be
 20 submitting in the form of technical material and a price
 21 proposal will be all that, as far as we're concerned, will
 22 be all that will ever meet us. There won't be a second
 23 chance. It's an award. We're intending to make award
 24 strictly on what you submit.

25 And after the winning firm is identified, a firm

1 fixed price will be awarded to one firm submitting the
 2 lowest price technically acceptable offer. And I'm back
 3 to technically acceptable. Make sure you read Section
 4 110.

5 In the event that we find that nobody is within
 6 the selected range, we will have -- we will establish a
 7 competitive rate based on technical evaluations and price
 8 understanding. Competitive range is after initial
 9 evaluation of proposals, if a contracting officer
 10 determines that discussions are required, the contracting
 11 officer will establish a competitive range comprised of
 12 technically acceptable proposals. Discussions will be
 13 held with firms in the competitive range. So, once again,
 14 make sure that when you submit your proposal initially,
 15 you have complied with everything that's asked for in
 16 Section 110 of the proposal.

17 Should it be necessary for discussions, the
 18 government will conduct written discussions with only
 19 those firms determined to be technically acceptable. If
 20 all proposals are determined to be nonacceptable, at the
 21 contracting officer's discretion, all firms may be
 22 requested to participate in discussions. As a result of
 23 the discussions, offerors may make revisions to their
 24 initial proposal. Discussions will culminate in a request
 25 for final proposal revision, the date and time of which

1 will be common to all offerors.

2 In the event that we cannot establish somebody
 3 who is technically acceptable with the lowest price for
 4 whatever reason, we will go to the competitive range and
 5 discussions. This is the last resort. Right now we
 6 intend to make award based on what you submit in your
 7 proposals.

8 In Section 600, this is your certs and reps,
 9 they must be completed and submitted with the proposal.
 10 So make sure you go over Section 600 to see what else you
 11 need to submit, what other information is required.
 12 Section 700 are your contract clauses. The contract
 13 clauses are in full text. This is not the solicitation
 14 clauses, this is the contract clauses, so that it's right
 15 up front, you know what the contract will be calling for
 16 as far as the different clauses pertaining to this
 17 particular solicitation once it's become the contract.

18 Special contract clauses, unique to this
 19 requirement. Commencement of this contract is the date
 20 the contractor receives the notice to proceed and complete
 21 the entire work ready for use not later than 440 calendar
 22 days from notice to procedure. And you will find that in
 23 Section SC-1. It's the first part of the clause that's in
 24 there.

25 Liquidated damages. There is a liquidated

1 damages and you find it located in SC-2 in Section 800.

2 Performance of work. The contractor, the prime
 3 contractor, must perform at least 15 percent of the work.
 4 And you'll find that in Section SC-7, clause SC-7. Wage
 5 determinations you'll find in FAR, 52.222-6, the Davis
 6 Bacon Act. Davis Bacon establishes a minimum amount to be
 7 paid. Davis Bacon wage determination for the geographical
 8 area of this project.

9 Now, so that everybody knows what -- I've been
 10 talking about the FAR, right. Let me give you where I go.
 11 I go to <http://farsite.hill.af.mil>. That is a great
 12 resource for you and it's open to the general public so
 13 you can go out there and look at it and you'll see exactly
 14 the same thing I do and it has the most current FAR
 15 clause, FAR information. And they change that thing on a
 16 daily basis. That is DOD's official website for the FAR.

17 Check the Corps of Engineers website on a
 18 regular basis. I can't overemphasize it, to see what
 19 amendments are out there. Like I said, there's already
 20 one amendment out there now which changed the closing
 21 date, 27th of February to the 26th. That's been out
 22 there, so it's a day the solicitation was offered. Ensure
 23 you have completed all information required by the
 24 solicitation package and submit those items with your
 25 proposal.

1 Back to Section 110 again. Make sure you read
2 it and comply with it. Ensure compliance with the
3 solicitation requirements. Solicitation only -- is only
4 changed by written amendment. So I'm back to if you got a
5 technical question or you find something in there that
6 needs to be addressed and you want an answer to it, for
7 example, they tell you this wall has to be here, let's
8 say, they didn't give you the drawings for that wall, how
9 are you going to hold up the second floor, you know, it's
10 one of those things.

11 Submit it to tech bid. It will be evaluated, it
12 will be addressed and there would most likely be an
13 amendment to the contract. I'm sure they don't want us to
14 try and stand something up with three walls. Okay.
15 Solicitations only changed by a written amendment and the
16 government intends to award on initial offers to the firm
17 that is technically acceptable and submitting the lowest
18 priced offer.

19 With that in mind and with the information that
20 you have there, does anyone have any questions? If you
21 have any trouble downloading any information off the
22 Internet, please feel free to give me a call, I'll walk
23 you through it. If I can't get you to it, I will get
24 someone who will.

25 MR. NAKAMOTO: Okay. I think we just need to

1 clarify that the wage determination of the Davis Bacon
2 Act, you need to go to Cascade County. And if you're
3 unsuccessful -- maybe you want to just go ahead.

4 MR. KORSLIEN: Just to elaborate on that a
5 little more. We are in Cascade County and if you look at
6 Page WD-1, it does talk about the Davis Bacon. Anything
7 five foot outside the building is heavy and highway rate
8 and from five foot in is residential rate.

9 MR. NAKAMOTO: All right. Now, in addition to
10 that, I want to let you know that if you don't find a
11 trade that is listed, you should call in to the Corps and
12 ask that question because we have persons that can get
13 that information but the problem with that is it takes a
14 while in our office of counsel. Residential construction
15 sometimes doesn't cover certain areas in the wage
16 determination. So if you're not familiar with it, you
17 should ask a question.

18 The other part to that is, in construction,
19 going to be audited. So if you do not cover that portion,
20 you might find yourself having to owe funds before you can
21 close the project out. And I'll give you an example. If
22 you hire someone at the very beginning of a project, he
23 gets paid and he moves on and you don't know where he
24 went, it's going to be up to you to find this person and
25 settle the wage difference. So the suggestion I have is,

1 be sure you identify that person's wage, make sure he
2 meets the Davis Bacon Act before he leaves your employ.

3 Do you have any questions to that? We have had
4 similar situations where it took five years to settle and
5 the contractor didn't get paid because he couldn't find
6 that guy, okay. So it may not sound important but it is
7 at the closeout. The other question I want to raise is,
8 does anybody have a question on the Buy American Act? If
9 you do -- okay.

10 MR. OSWOOD: Yes.

11 MR. NAKAMOTO: Sir, could you identify yourself
12 for the reporter?

13 MR. OSWOOD: Brian Oswood, BGL Builders. I have
14 a question concerning the Buy American Act. Will Canadian
15 lumber or Canadian prefab panels that would be installed
16 under the division six carpentry, would that fall under
17 the Buy American Act on this project?

18 MR. NAKAMOTO: That's a Tom DeGonia question.

19 MR. OSWOOD: Hi, Tom.

20 MR. DEGONIA: Okay. Let's go back here.

21 MR. OSWOOD: Because I read through those FAR
22 clauses. I have a copy of the FAR book and that one page
23 that was in the, I think the special clauses. I haven't
24 came across a specific dollar amount. I heard numbers out
25 that there this project is not 6.5 million so that will

1 not apply.

2 MR. DEGONIA: Well, I put those FAR clauses in
3 there. There are specific guidelines for putting in
4 certain FAR clauses.

5 MR. OSWOOD: Right.

6 MR. DEGONIA: The clauses that are in here
7 pertain to the dollar amount that is estimated for this
8 project.

9 MR. OSWOOD: Right.

10 MR. DEGONIA: So whatever it says, that's what
11 we go by. That's just a straightforward answer to you.

12 MR. OSWOOD: Thank you.

13 MR. GAMBLE: You include all the provisions in
14 the Buy American Act clause that's in there, 52.25?

15 MR. DEGONIA: That applies to this contract
16 based on the dollar amount.

17 MR. NAKAMOTO: 52 -- let's see .55 and .11, Tom?

18 MR. DEGONIA: 52.225-10.

19 MR. NAKAMOTO: Dash 10. Do you understand the
20 answer to that?

21 MR. OSWOOD: No.

22 MR. NAKAMOTO: There's a dollar threshold. If
23 it goes over a certain dollar amount, we put a different
24 clause in.

25 MR. OSWOOD: Uh-huh.

1 MR. NAKAMOTO: If it stays below the threshold
 2 you put a different clause. We have to do that now.
 3 Because if we don't do it now, it depends on the order of
 4 the chronology. You understand what I'm saying, right?
 5 MR. OSWOOD: I understand that.
 6 MR. NAKAMOTO: We have a dollar value and
 7 putting in the wrong clause and we issue an award, and
 8 then there is a change, somebody may lose out. So we
 9 don't want to do that.
 10 MR. DEGONIA: Okay. On the Buy American,
 11 definition: Construction material, domestic construction
 12 material and foreign construction material as used in this
 13 provision are defined in the clause of this solicitation
 14 entitled Buy American Act construction material, Federal
 15 Acquisition Regulation, FAR clause 52.225-9, which is in
 16 the actual contract. Request for determinations of
 17 inequitability. An offeror requesting a determination
 18 regarding the inequitability of the Buy American Act
 19 should submit the request to the contracting officer in
 20 time to allow a determination before submission of
 21 materials.
 22 So if you're talking about buying, oh, Chinese
 23 light fixtures, okay, and submit it, you're either going
 24 to get a yea or a nay or else you're in violation of the
 25 Buy American Act.

1 MR. OSWOOD: Okay.
 2 MR. DEGONIA: So if it's approved up front,
 3 contracting officer has to approve it. And it's up to
 4 whoever is making the solicitation to submit that, a
 5 request for their approval. And the evaluation of offers,
 6 the government will evaluate an offer requesting exception
 7 to the requirements of the Buy American Act based on
 8 claimed reasonableness, reasonable cost of domestic
 9 construction material by adding to the offeror's price the
 10 appropriate percentage of the cost of such foreign
 11 construction material as specified in.
 12 Basically what happens is, that let's say you
 13 buy an item, a foreign item, and it costs \$10, we have a
 14 domestic item that costs \$9 -- or, I'm sorry, let me
 15 reverse that. We have a domestic item that costs \$10 and
 16 a foreign item that costs \$9. The foreign item will have
 17 a percentage added onto it. I don't know whether it tells
 18 you in here or not what the percentage is. There is a
 19 requirement --
 20 MR. DEVINE: It's six percent.
 21 MR. DEGONIA: Pardon?
 22 MR. DEVINE: It's six percent.
 23 MR. DEGONIA: Six percent, okay. And that will
 24 be added onto the foreign product which may bring it up to
 25 \$10.01. Which means it would be more costly than the

1 American item. Does that answer your question?
 2 MR. OSWOOD: Yes.
 3 MR. DEGONIA: Okay.
 4 MR. NAKAMOTO: In other words, there is a lot
 5 more paperwork that goes into it, at least the components,
 6 we're talking about components.
 7 Is there any other questions concerning the
 8 technical proposal?
 9 MR. DEGONIA: Basically what we're talking about
 10 here is we're talking about NAFTA and -- okay. It says if
 11 the government determines that a particular, is that the
 12 paragraph? Which paragraph is it?
 13 Okay. What I will do when I go back, I will get
 14 with legal counsel and have them give me a formal reading,
 15 legal reading. How is that?
 16 MR. OSWOOD: Perfect.
 17 MR. DEGONIA: Which will address NAFTA and all
 18 the other peculiarities. That will be in the amendment,
 19 okay?
 20 MR. OSWOOD: Thank you.
 21 MR. NAKAMOTO: Any questions on the technical
 22 portion? If not, could I ask if there is a question on
 23 the site visit? Okay.
 24 Tom, is there anything else we want to cover?
 25 MR. DEGONIA: Only if they have more questions.

1 MR. NAKAMOTO: Okay. If there are no questions,
 2 I'm going to call for adjournment. So if not, then, this
 3 debriefing and evaluation site visit is now concluded.
 4 Thank you very much for attending. Good luck to all of
 5 you.
 6 PROCEEDINGS CONCLUDED
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1 CERTIFICATE OF REPORTER

2

3 STATE OF MONTANA)

) ss.

4 County of Cascade)

5 I, Gregory A. Frank, RPR, Court Reporter and
6 Notary Public for the State of Montana, residing in Great
7 Falls, Montana, do hereby certify:

8 That I was duly authorized to and did report the
9 transcript of proceedings in the above-entitled cause;

10 That the foregoing pages of this transcript of
11 proceedings constitute a true and accurate transcription
12 of my stenotype notes.

13 I further certify that I am not an attorney nor
14 counsel of any of the parties, nor a relative or employee
15 of any attorney or counsel connected with the action, nor
16 financially interested in the action.

17 IN WITNESS WHEREOF, I have hereunto set my hand
18 and seal on this the 7th day of February, 2003.

19

20

21 _____
Gregory A. Frank, RPR
Registered Professional Reporter
22 Notary Public, State of Montana
Residing in Great Falls, Montana.
23 My Commission expires: 2/10/2007.

24

25

MEETING ATTENDANCE ROSTER

PROJECT DESCRIPTION: FY03 Replace Family Housing, Phase 6A

MEETING PURPOSE: Pre-Proposal Meeting and Site Visit

LOCATION: Project Sites and Education Center, Room 101

<u>Name</u>	<u>Organization</u>	<u>Title</u>	<u>Phone No.</u>	<u>Email</u>
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I. INTRODUCTION: During the site visit for solicitation DACA67-03-R-0207, Replace Family Housing, Phase 6A, Malmstrom AFB, Montana, which was conducted on 6 February 2003, the following question was ask but not answered. At that time the answer was deferred until the next amendment to the solicitation was issued.

II. QUESTIION: Can Canadian lumber and other materials be used on this project, as the cost is far less than the same American product?

III. REPLY:

BUY AMERICAN ACT

The Buy American Act as is being used in this solicitation is described in the following FAR prescriptions and clauses.

PRESCRIPTION

25.1102 Acquisition of construction.

(a) Insert the clause at 52.225-9, Buy American Act--Construction Materials, in solicitations and contracts for construction that is performed in the United States valued at less than \$6,481,000.

(1) List in paragraph (b)(2) of the clause all foreign construction material excepted from the requirements of the Buy American Act.

(2) If the head of the agency determines that a higher percentage is appropriate, substitute the higher evaluation percentage in paragraph (b)(3)(i) of the clause.

(b)

(1) Insert the provision at 52.225-10, Notice of Buy American Act Requirement--Construction Materials, in solicitations containing the clause at 52.225-9.

(2) If insufficient time is available to process a determination regarding the inapplicability of the Buy American Act before receipt of offers, use the provision with its Alternate I.

(c) Insert the clause at 52.225-11, Buy American Act--Construction Materials under Trade Agreements, in solicitations and contracts for construction that is performed in the United States valued at \$6,481,000 or more.

(1) List in paragraph (b)(3) of the clause all foreign construction material excepted from the requirements of the Buy American Act, other than designated country or NAFTA country construction material.

(2) If the head of the agency determines that a higher percentage is appropriate, substitute the higher evaluation percentage in paragraph (b)(4)(i) of the clause.

(3) For acquisitions valued at \$6,481,000 or more, but less than \$7,304,733, use the clause with its Alternate I.

(d)

~~(1) Insert the provision of DACA-67-03-R-0207 Notice of Buy American Act Requirement-- Construction Materials under Trade Agreements, in solicitations containing the clause at 52.225-11.~~

~~(2) If insufficient time is available to process a determination regarding the inapplicability of the Buy American Act before receipt of offers, use the provision with its Alternate I.~~

~~(3) For acquisitions valued at \$6,481,000 or more, but less than \$7,304,733, use the clause with its Alternate II.~~

Per the remaining paragraph listed above the two clauses that are to be used are 52.225-9 and 52.225-10. These two clauses provide guidance on what is required to support the Buy American Act. Clause 52.225-10 is placed in Section 00100 to alert offerors that the Buy American Act applies based on an estimated cost of less than \$6,481,000, while 52.225-9 is placed in Section 00700 to provide guidance on what will be allowed and how to apply for use of other than American made materials.

The following is taken from FAR clauses 52.225-9 and 52.225-10.

CLAUSES

FAR CLAUSE 52.225-9

Buy American Act-Construction Materials (May 2002)

(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 pre-assembled 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 un-manufactured 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 non-availability 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''*]

FAR Clause 52.225-10

(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)

Alternate I (May 2002). As prescribed in 25.1102(b)(2), substitute the following paragraph (b) for paragraph (b) of the basic provision:

(b) Requests for determinations of inapplicability. An offeror requesting a determination regarding the inapplicability of the Buy American Act shall submit the request with its offer, including the information and applicable supporting data required by paragraphs (c) and (d) of the clause at FAR 52.225-9.

FAR Clause 52.225-9

(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 Buy American 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) *
<i>Item 1</i>			
Foreign construction material			
Domestic construction material			
<i>Item 2</i>			

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).]

In FAR clause 52.225-5 the following is provided.

"North American Free Trade Agreement country end product" means an article that--

- (1) Is wholly the growth, product, or manufacture of a North American Free Trade Agreement (NAFTA) country; or
- (2) In the case of an article 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 article of commerce with a name, character, or use distinct from that of the article or articles from which it was transformed. The term refers to a product offered for purchase under a supply contract, but for purposes of calculating the value of the end product includes services, (except transportation services) incidental to the article, provided that the value of those incidental services does not exceed that of the article itself.

"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.

"U.S.-made end product" means an article that is mined, produced, or manufactured in the United States or that is substantially transformed in the United States into a new and different article of commerce with a name, character, or use distinct from that of the article or articles from which it was transformed.

(b) *Implementation.* This clause implements the Trade, Agreements Act (19 U.S.C. 2501, *et seq.*) and the North American Free Trade Agreement Implementation Act of 1993, (NAFTA) (19 U.S.C. 3301 note), by restricting the acquisition of end products that are not U.S.-made, designated country, Caribbean Basin country, or NAFTA country end products.

(c) *Delivery of end products.* The Contracting Officer has determined that the Trade Agreements Act and NAFTA apply to this acquisition. Unless otherwise specified (*See Far Clause 52.225-9*), these trade agreements apply to all items in the Schedule. The Contractor shall deliver under this contract only U.S.-made, designated country, Caribbean Basin country, or NAFTA country

end products except to the extent that, in its offer, it specified delivery of other end products in the provision entitled ``Trade Agreements Certificate."`

IV. Based on the FAR Clauses used in this RFP, the Buy American Act applies to the prefab panels, trusses, and other items produced in Canada or other countries. The procedures that are required to request a waiver are noted in 52.225-9 and 52.225-10. At the present time, the Contracting Officer has not identified any materials that are exempt or waived from complying with the Buy American Act. Note the procedures that are describe in FAR clause 52.225-9 to request a waiver to the act.