W911KB-04-B-0008

BIDDING DOCUMENTS

OAK AVE. / NEELY ROAD UTILITIES UPGRADE

FT WAINWRIGHT, ALASKA

SOLICITATION, OFFER, AND AWARD
SUPPLIES OR SERVICES AND PRICE/COSTS
CONSTRUCTION SPECIFICATIONS/STATEMENT OF WORK
INSPECTION AND ACCEPTANCE
SPECIAL CONTRACT REQUIREMENTS
CONTRACT CLAUSES
LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS
REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF BIDDERS
INSTRUCTIONS, CONDITIONS, AND NOTICES TO BIDDERS
EVALUATION FACTORS FOR AWARD

8A COMPETITIVE

JULY 2004

U.S. ARMY ENGINEER DISTRICT, ALASKA
CORPS OF ENGINEERS
P.O. BOX 6898
ELMENDORF AFB, ALASKA 99506-6898

INCREASE PROFIT **SUBMIT VE CHANGES**

DESIGN AUTHENTICATION

Signatures affixed below indicate the drawings and specifications included in this solicitation were prepared, reviewed, and certified in accordance with ER 1110-345-100, Design Policy for Military Construction.

SOLICITATION:	**W911KB-04-B-0008**
UPC:	**FTW269**
PROJECT TITLE:	**OAK AVE. / NEELY ROAD UTILITIES UPGRADE**
LOCATION:	**FORT WAINRIGHT, ALASKA**
CONTRACT TYPE:	**8a COMPETITIVE IFB**
SUBMITTAL:	**FINAL**

For

OLTON SWANSON, P.E.
Chief, Engineering Division

08 JULY 2004
Date

Randall L Bowker

For LAURA A. WALKER, P.E.
Chief, Military Technical Engineering Branch

This project was designed by the Alaska District of the U.S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152.

SOLICITATION, OFFER, AND AWARD *(Construction, Alteration, or Repair)*	1. SOLICITATION NUMBER	2. TYPE OF SOLICITATION	3. DATE ISSUED	PAGE OF PAGES
	W911KB-04-B-0008	☒ SEALED BID *(IFB)* ☐ NEGOTIATED *(RFP)*	07/20/04	

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

4. CONTRACT NUMBER	5. REQUISITION/PURCHASE REQUEST NUMBER	6. PROJECT NUMBER

7. ISSUED BY CODE W911KB

US ARMY ENGINEER DISTRICT, ALASKA
CEPOA-CT (W911KB)
PO BOX 6898
ELMENDORF AFB, AK 99506-6898

8. ADDRESS OFFER TO

SEE ITEM 7

9. FOR INFORMATION CALL ▶ A. NAME Tamela Perry B. TELEPHONE NUMBER *(Include area code) (NO COLLECT CALLS)* (907)753-5579

SOLICITATION

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

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS *(Title, identifying number, date):*

NAICS: 237990
PROJECT TITLE/LOCATION: Neely Road Utilities Upgrade, Ft Wainwright, Alaska
COMPETITIVE 8(a) SET-ASIDE
DESCRIPTION OF WORK: Repair of approximately 8,000 feet of utilidor systems on Ft Wainwright located in Fairbanks, Alaska Repairs include complete replacement of sewer, water, steam and steam condensate lines within existing utilidor structures on Oak Ave, Montgomery Avenue and Neely Road, including service to buildings on Neely Road. Work will also include construction of 2,100 feet of utilidor to encase existing direct bury utilities (sewer, water, steam and steam condensate lines, enlargement of some existing manholes and asbestos abatement. Responders are advised that the requirements may be delayed, cancelled or revised at any time during the solicitation, selection, evaluation, negotiation, and/or final award process based on decisions related to DOD changes and dispositions of the Artmed Services.

This competition is limited or restricted geographically to the Alaska Small Business Administration District servicing area. All 8(a) certified firms serviced by the Alaska District Office and all 8(a) certified firms with a bonafide place of business in the Alaska District Office servicing area are deemed eligible to submit offers. In additiion, it has been determined that competition will not be restricted by stage (transitional or developmental) of 8(a) program participation. SBA Requirement No.: 7700-04-405503

11. The Contractor shall begin performance within 10 calendar days and complete it within _____ calendar days after receiving ☐ award, ☒ notice to proceed. This performance period is ☒ mandatory, ☐ negotiable. *(See* Section 00700, 52.211-10 *.)*

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

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 1 copies to perform the work required are due at the place specified in Item 8 by 2:00 pm *(hour)* local time 20 Aug 2004 *(date).* If this is a sealed bid solicitation, offers will be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

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

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

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

OFFER *(Must be fully completed by offeror)*

14. NAME AND ADDRESS OF OFFEROR *(Include ZIP Code)*	15. TELEPHONE NUMBER *(Include area code)*
	16. REMITTANCE ADDRESS *(Include only if different than Item 14)*
CODE FACILITY CODE	

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

AMOUNTS ▶

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

19. ACKNOWLEDGEMENT OF AMENDMENTS
(The offeror acknowledges receipt of amendments to the solicitation - give number and date of each)

AMENDMENT NO.										
DATE										

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

AWARD *(To be completed by Government)*

21. ITEMS ACCEPTED

22. AMOUNT	23. ACCOUNTING AND APPROPRIATION DATA
24. SUBMIT INVOICES TO ADDRESS SHOWN IN ▶ *(4 copies unless otherwise specified)* ITEM	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO ☐ 10 U.S.C. 2304(c) ( ) ☐ 41 U.S.C. 253(c) ( )
26. ADMINISTERED BY CODE	27. PAYMENT WILL BE MADE BY

CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

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

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

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

! ! ! C A U T I O N T O B I D D E R S ! ! !

1. **BUSINESS HOURS:** For the Alaska District Corps of Engineers is from 7:30 A.M. to 4:00 P.M., Monday through Friday.

2. **SUBMIT PROPOSALS:** Hand deliveries to the Alaska District shall be delivered to the security desk in the lobby. Call extension 753-5579 or 753-2545 in advance to arrange for pick-up. Be advised there is limited telephone service in the lobby. Please be sure to submit bids by the time specified on Standard Form 1442, Block 13-A. Any bids received after the specified time will not be accepted.

3. **VISITORS TO ELMENDORF AFB:** ***NOTE: *Boniface gate has reopened and the visitor center returned to Boniface Gate with hours of operation from 0700-2200 daily*. **(See Section 00100).** You are required to have the following to obtain a base pass: current Anchorage emissions control inspection certificate, driver's license, DOD ID card (if applicable), proof of insurance, Alaska vehicle registration and Contracting Division point of contact/telephone number. (SEE SECTION 00100)

4. **AMENDMENTS:** Have you acknowledge receipt of **ALL** amendments? If in doubt as to the number of amendments issued, please contact our office, (907)753-2545. SEE SECTION 00100 FOR ADDITIONAL INFORMATION REGARDING AMENDMENTS.

5. **AMENDED BID PAGES:** If **any** of the amendments furnished amended bid pages, **the amended pages must be used** in submitting your bid.

6. **BID GUARANTEE:** Sufficient bid guarantee in proper form (SF 24) must be furnished **with your BID.** (FOR JOBS EXCEEDING $25,000) (SEE SECTION 00100)

7. **MISTAKE IN BID:** Have you reviewed your bid price for possible errors in calculation or work left out?

8. **TELEGRAPHIC MODIFICATIONS:** THE ALASKA DISTRICT DOES NOT HAVE THE CAPABILITY OF RECEIVING COMMERCIAL TELEGRAMS DIRECTLY. Bidders who wish to modify their offer by telegram are urged to ensure that telegrams are submitted within enough time to arrive at the offer depository room prior to the time specified for bid opening. (SEE STANDARD FORM 1442, BLOCK 13-A FOR SPECIFIC BID OPENING TIME). Any doubt as to time should be resolved in favor of **EXTRA TIME.** Transmission by Fax to this office is **NOT ACCEPTABLE.**

9. **BID ACCEPTANCE PERIOD:** The minimum bid acceptance period is specified in block 13D of the Standard Form 1442, Solicitation, Offer and Award. Please ensure that you allow at least the stated number of calendar days for the Government to accept your bid.

10. **WEB-SITE:** If you have access to the Internet, updated project listing and planholder lists are available at https://ebs.poa.usace.army.mil/AdvertisedSolicitations.asp

TABLE OF CONTENTS

SECTION 00010 Solicitation/Contract Forms (SF1442)
Supplies or Services and Price/Costs

SECTION 00100 Schedule/Instruction to Bidders/Offerors
SECTION 00120 Evaluation Factors for Award

SECTION 00600 Representations and Certifications

SECTION 00700 Contract Clauses
00700a Wage Rates

SECTION 00800 Special Contract Requirements

SECTION 01000 Division I, General Requirements

SECTION 16999 Divisions 2 - 16, Technical Provisions (if applicable)

RETURN THE FOLLOWING WITH YOUR BID:

Section 00010 - Completed
Section 00600 - Completed
20% Bid Bond

BID SCHEDULE

OAK AVE./ NEELY ROAD UTILITIES UPGRADE

FT WAINWRIGHT, ALASKA

Item No.	Description	Estimated Quantity	Unit	Unit Price	Amount
	BASE ITEM				
0001	Montgomery Road: Revitalize the utilidor from MH 4-3-7 to MH H4-2-6 and north of MH H4-2-2 inclusive, complete. Oak Avenue Utilidor Section: Revitalize Oak Avenue utilidor from MH H4-8-2 to H4-8-3 inclusive, construct utilidor from MH H4-8-3 to MH H4-9-2, complete. Oak Avenue Direct Buried Utility: Remove and replace buried steam and condensate lines from MH H4-9-2 to MH H5-7-3 Inclusive, complete. Neely Road: Revitalize the utilidor from MH H4-5-2 to MH H4-6-1, inclusive. Remove and replace buried utilities to Building 3726 (Post Office). Revitalize building lateral to Building 3724, complete.	1	Lump sum	$_____	$_____

Total of Base Item 0001 $_____

Item No.	Description	Estimated Quantity	Unit	Unit Price	Amount
	OPTIONAL ITEMS				
0002	Option 1, Neely Road: Revitalize the utilidor from MH H4-6-1 to MH H4-6-2 inclusive, complete.	1	Lump sum	$_____	$_____
0003	Option 2, Neely Road: Revitalize the utilidor from MH H4-6-2 to MH H4-6-4, complete. (Can only be awarded if Option 1 is awarded.)	1	Lump sum	$_____	$_____
0004	Option 3, Neely Road: Revitalize the utilidor from MH H4-6-4, inclusive, to MH H4-6-5 inclusive, complete. (Can only be awarded if Option 2 is awarded.)	1	Lump sum	$_____	$_____
0005	Option 4, Neely Road: Revitalize the utilidor from MH H4-6-5 to MH H5-4-1, complete. (Can only be awarded if Option 3 is awarded.)	1	Lump sum	$_____	$_____
0006	Option 5, Neely Road: Revitalize the utilidor from MH H5-4-1, inclusive, to MH H5-4-2 inclusive, complete. (Can only be awarded if Option 4 is awarded.)	1	Lump sum	$_____	$_____
0007	Option 6, Neely Road: Revitalize the utilidor from MH H5-4-2 to MH H5-4-3 inclusive, complete. (Can only be awarded if Option 5 is awarded.)	1	Lump sum	$_____	$_____
0008	Option 7, Buildings 3707, 3706 and 3708, complete. (Can only be awarded if Option 5 is awarded.)	1	Lump sum	$_____	$_____

0009	Option 8, Electrical Feeder 12-13, complete. (Can be awarded regardless of any other option being awarded or not awarded.)	1	Lump sum	$_____	$_____

Total of Optional Items (0002 thru 0009) $_____

Total of Base and Optional Items (0001 thru 0009) $_____

1. AWARD: Award will be made in accordance with FAR Provision 52.214-18 included in this solicitation.

2. INCOMPLETE BIDS: Failure to submit a bid on all line items in the schedule will result in an incomplete bid and the bid will be rejected. Lump sum prices must be shown for each item within the schedule.

3. EVALUATION OF OPTIONS: See Contract clause 52.217-5.

-- End of bid Schedule --

PROPOSAL NO. W911KB-04-B-0008

If the offer is submitted by a corporation, partnership, Joint Venture or an LLC, the applicable form listed must be completed. In the alternative, other evidence must be submitted to substantiate the authority of the person signing the offer. If a corporation, the same officer shall not execute both the offer and the certificate.

LLC

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

_____(CORPORATE SEAL)
(Secretary)

CORPORATE CERTIFICATE

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

_____(CORPORATE SEAL)
(Secretary)

AUTHORITY TO BIND PARTNERSHIP

This is to certify that the names and signatures of all partners are listed below and that the person signing the offer had authority to actually bind the partnership pursuant to its partnership agreement. Each of the partners individually has full authority to enter into and execute contractual instruments, on behalf of said partnership, with the United States of America, except as follows: (State "none" or describe limitations, if any.)

This authority shall remain in full force and effect until such time as the revocation of authority by any cause whatsoever has been furnished in writing to, and acknowledged by, the Contracting Officer.

_____
(Type or Print Name) (Signature)

PROPOSAL NO. W911KB-04-B-0008

JOINT VENTURE

I, _____ , certify that I am the Secretary of the Corporation named as Offeror/Contractor Herein, that who signed this offer/contract on behalf of the Offeror/Contractor was then _____ of said corporation by authority of its governing body and is within the scope of its corporate powers. IN WITNESS WHEREOF, I have hereunto affixed my hand and the seal of said corporation this _____ day of

AFFIX CORPORATE SEAL

_____
(Secretary)

JOINT VENTURE

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

IN WITNESS WHEREOF, I have hereunto affixed my hand and the seal of said corporation this _____ day of _____.

AFFIX CORPORATE SEAL

_____
(Secretary)

PROPOSAL NO. W911KB-04-B-0008

PRE-AWARD QUESTIONNAIRE

Following offer opening, the apparent low offeror will be contacted and requested to submit the data referenced below. This will expedite our pre-award process. Prior to awarding any contract, it is required for this office to have on record specific information concerning the apparent low, responsible, responsive offeror. Accordingly it is requested that you complete the following form and return to this office, ATTN: Contracting Division, CEPOA-CT-SP.

Name of Contractor _____ X Proper Block

Business Address _____ Corporation

City/State/Zip _____ Partnership

Telephone No. _____ Individual

Operating Office Address, (This Area): J/V

LLC

Name of Contractor

Business Address _____ inc. in State of:
City/State/Zip
Telephone No.

Year inc.

LIST OF CORPORATION OFFICERS/PARTNERS BY NAME AND TITLE

_____ Small Business

_____ Large Business

_____ Minority Business

YEARS EXPERIENCE in the field of proposed work (_____).
Also indicate similarity between work currently being produced and work required under subject invitation:

Financial Institution Ratings. Is your firm listed in:
a. Dun & Bradstreet: ____No ____Yes: If yes, what is the rating?
b. Thomas Register: ____No ____Yes: If yes, what is the rating?

CERTIFIED CURRENT BALANCE SHEET and latest PROFIT AND LOSS STATEMENT signed by an officer of the company. The name of your banking firm and telephone number and the name of the individual to contact for a line-of-credit reference. The last financial statements will be acceptable if they are less than 6 months old.

PROPOSAL NO. W911KB-04-B-0008

List all pending lawsuits or unsatisfied judgments against you; the nature of same and Court where filed or adjudicated. Lawsuits or judgments where full payment will be made, or are covered by your insurance are not to be included.

_____

_____

_____

List all your contract claims pending; state nature and amount of each claim and approximate date filed.

_____

_____

_____

Name(s) of Bonding Company(ies)_____

Business Address(es)_____

Your bonding capacity as established by your surety $_____

PLEASE ATTACH with Pre-Award Questionnaire a list of tools, equipment and facilities, with year, date and value which will be used for this project.

By my signature hereon, I certify that the offer price of $
on
subject project has been reviewed and is without error.

Signature_____

Title_____

Date_____

SECTION 00100
INSTRUCTION TO BIDDERS/OFFERORS

NOTE: Joint Venture Agreements - Joint Ventures are allowable on competitive 8(a) set-asides, however, SBA must receive the joint venture agreement prior to proposal due date and approved before award of a resulting contract. If you are contemplating a joint venture on this project, you must advise your assigned Business Opportunity Specialist (BOS) as soon as possible. It is also recommended that the agreement be submitted as soon as practicable to ensure compliance with established regulations. Any corrections and/or changes needed can be made only when your BOS has adequate time for a thorough review before the proposal due date. **NO CORRECTIONS AND/OR CHANGES ARE ALLOWABLE AFTER TIME OF SUBMISSION OF PROPOSAL OR BIDS.**

1. MAGNITUDE

The magnitude of this project is $10,000,000 - $25,000,000

2. PLANS AND SPECIFICATIONS

Plans and specifications will be available on our website at no charge. http://www.poa.usace.army.mil/contracting/default.asp

3. **BOND AMOUNT REQUIRED** (SEE CLAUSE 52.228-15, Performance and Payment Bonds-Construction(JUL2000) Section 00700

4. EQUIPMENT OWNERSHIP AND OPERATION EXPENSE SCHEDULE

Whenever a contract or modification of contract price is negotiated, the contractor's cost proposal for equipment ownership and operating expenses shall be determined in accordance with the requirements of EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE, contained in Section 00700, Far Clause 52.231-5000. A copy of EP 1110-1-8 "Construction Equipment Ownership and Operating Expense Schedule" is available for review at the US Army Engineers District, Alaska, Bldg. 2204 Third St, Room 50, Elmendorf AFB, Alaska and at http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/sp.htm

5. INQUIRIES

Prospective bidders may submit inquiries to:

a. Tamela Perry, Contract Specialist, (907)753-5579, FAX (907) 753-2544 or e:mail tamela.r.perry@usace.army.mil. Written inquiries should be addressed to: U.S. Army Engineer District, Alaska, Contracting Division, ATTN: Tamela Perry, Civil Military Branch, P.O. Box 6898, Elmendorf AFB, AK 99506-6898

COLLECT CALLS WILL NOT BE ACCEPTED.

6. VISITORS TO THE ARMY AND AIR FORCE BASES

All vehicle operators are required to wear seatbelts. Vehicle operators caught not wearing seatbelts will lose their driving privileges for 10 days on their first offense, 30 days on the second offense, and 6 months or longer on the third offense.

If a firm does not have a current pass to obtain entry to Elmendorf AFB, the firm may request a day pass using the following procedures:

Forty-eight hours (48) prior to your meeting or delivery of bid, the firm must contact Tamela Perry at the above e:mail and request a day pass. The firm must provide: a) the solicitation number; b) the names of all persons in the vehicle; c) the name of their employer(s). State that it is a request for a day pass.

On the day of entry, the driver must go to the **BONIFACE (SEE NOTE BELOW)** Gate and provide: a) valid driver's license; b) proof of current insurance; c) proof of current IM certificate; d) current vehicle registration. Be sure to inform security police that you are on the list for a day pass.

Please allow enough time to submit your bid, due to possible changes in base access requirements for security reasons. No public telephone service is provided at the MULDOON Gate.

****NOTE: DUE TO CONSTRUCTION,** The following information has been released by the Security Forces on Elmendorf regarding vehicle gates:

a. Boniface gate has reopened and the visitor center returned to Boniface Gate with hours of operation from 0700-2200 daily.

b. GOVERNMENT HILL GATE IS NOW CLOSED FROM 30 JUNE THROUGH 3 SEPTEMBER.

c. Post Road Gate will operate for 24 hours a day, 7 days a week, during this time; however, commercial traffic will only be allowed through Post Road Gate between 0600-1900 hours

d. Muldoon Gate will revert to normal daytime hours of operation, 0600-1800 and will be closed on weekends.

e. Arctic Warrior will be closing 26 July – end of September. Detour information will be provided when received.**

7. FACSIMILE BIDS

Facsimile bids or modifications will not be accepted.

8. PICK-UP SERVICE FOR TELEGRAPHIC AMENDMENTS

The US Army Engineers District, Alaska, does not provide pick-up service for telegraphic amendments.

9. PERFORMANCE OF WORK BY CONTRACTOR

Your attention is invited to FAR CLAUSE 52.219-14 entitled

"LIMITATIONS ON SUBCONTRACTING". Unless submitted with the bid, the successful contractor must furnish the Contracting Officer within 30 days after award a description of the work which he intends to perform with his own organization (e.g. earthwork, paving, birchwork, or roofing), the percentage of the total work this represents and the estimated cost thereof.

10. EXCLUSION OF DEBARRED AND SUSPENDED CONTRACTORS

By entering into this contract, the Contractor certifies that neither it, nor any person or firm who has an interest in the Contractor's firm, is a person, or firm ineligible to be awarded Government contracts by virtue of being suspended or debarred in accordance with FAR subpart 9.4 (AL85-30).

Section 00100 - Bidding Schedule/Instructions to Bidders

CLAUSES INCORPORATED BY FULL TEXT

52.204-7 CENTRAL CONTRACTOR REGISTRATION (OCT 2003)

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

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

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

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

Registered in the CCR database means that--

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

(2) The Government has validated all mandatory data fields and has marked the record “Active”.

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

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

(c) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one.

(1) An offeror may obtain a DUNS number--

(i) If located within the United States, by calling Dun and Bradstreet at 1-866-705-5711 or via the Internet at http://www.dnb.com; or

(ii) If located outside the United States, by contacting the local Dun and Bradstreet office.

(2) The offeror should be prepared to provide the following information:

(i) Company legal business.

(ii) Tradestyle, doing business, or other name by which your entity is commonly recognized.

(iii) Company Physical Street Address, City, State, and Zip Code.

(iv) Company Mailing Address, City, State and Zip Code (if separate from physical).

(v) Company Telephone Number.

(vi) Date the company was started.

(vii) Number of employees at your location.

(viii) Chief executive officer/key manager.

(ix) Line of business (industry).

(x) Company Headquarters name and address (reporting relationship within your entity).

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

(e) Processing time, which normally takes 48 hours, should be taken into consideration when registering. Offerors who are not registered should consider applying for registration immediately upon receipt of this solicitation.

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

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

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

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

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

(End of clause)

52.211-14 NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (SEP 1990)

Any contract awarded as a result of this solicitation will be DX rated order; c02 DO rated order certified for national defense use under the Defense Priorities and Allocations System (DPAS) (15 CFR 700), and the Contractor will be required to follow all of the requirements of this regulation.

(End of provision)

52.214-3 AMENDMENTS TO INVITATIONS FOR BIDS (DEC 1989)

(a) If this solicitation is amended, then all terms and conditions which are not modified remain unchanged.

(b) Bidders shall acknowledge receipt of any amendment to this solicitation (1) by signing and returning the amendment, (2) by identifying the amendment number and date in the space provided for this purpose on the form for submitting a bid, (3) by letter or telegram, or (4) by facsimile, if facsimile bids are authorized in the solicitation. The Government must receive the acknowledgment by the time and at the place specified for receipt of bids.

(End of provision)

52.214-4 FALSE STATEMENTS IN BIDS (APR 1984)

Bidders must provide full, accurate, and complete information as required by this solicitation and its attachments. The penalty for making false statements in bids is prescribed in 18 U.S.C. 1001.

(End of provision)

52.214-5 SUBMISSION OF BIDS (MAR 1997)

(a) Bids and bid modifications shall be submitted in sealed envelopes or packages (unless submitted by electronic means) (1) addressed to the office specified in the solicitation, and (2) showing the time and date specified for receipt, the solicitation number, and the name and address of the bidder.

(b) Bidders using commercial carrier services shall ensure that the bid is addressed and marked on the outermost envelope or wrapper as prescribed in subparagraphs (a)(1) and (2) of this provision when delivered to the office specified in the solicitation.

(c) Telegraphic bids will not be considered unless authorized by the solicitation; however, bids may be modified or withdrawn by written or telegraphic notice.

(d) Facsimile bids, modifications, or withdrawals, will not be considered unless authorized by the solicitation.

(e) Bids submitted by electronic commerce shall be considered only if the electronic commerce method was specifically stipulated or permitted by the solicitation.

(End of provision)

52.214-6 EXPLANATION TO PROSPECTIVE BIDDERS (APR 1984)

Any prospective bidder desiring an explanation or interpretation of the solicitation, drawings, specifications, etc., must request it in writing soon enough to allow a reply to reach all prospective bidders before the submission of their bids. Oral explanations or instructions given before the award of a contract will not be binding. Any information given a prospective bidder concerning a solicitation will be furnished promptly to all other prospective bidders as an amendment to the solicitation, if that information is necessary in submitting bids or if the lack of it would be prejudicial to other prospective bidders.

(End of provision)

52.214-7 LATE SUBMISSIONS, MODIFICATIONS, AND WITHDRAWALS OF BIDS (NOV 1999)

(a) Bidders are responsible for submitting bids, and any modifications or withdrawals, so as to reach the Government office designated in the invitation for bids (IFB) by the time specified in the IFB. If no time is specified in the IFB, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that bids are due.

(b)(1) Any bid, modification, or withdrawal received at the Government office designated in the IFB after the exact time specified for receipt of bids is “late” and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late bid would not unduly delay the acquisition; and--

(i) If it was transmitted through an electronic commerce method authorized by the IFB, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of bids; or

(ii) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of bids and was under the Government's control prior to the time set for receipt of bids.

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

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

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

(e) Bids may be withdrawn by written notice received at any time before the exact time set for receipt of bids. If the IFB authorizes facsimile bids, bids may be withdrawn via facsimile received at any time before the exact time set for receipt of bids, subject to the conditions specified in the provision at 52.214-31, Facsimile Bids. A bid may be withdrawn in person by a bidder or its authorized representative if, before the exact time set for receipt of bids, the identity of the person requesting withdrawal is established and the person signs a receipt for the bid.

(End of provision)

52.214-18 PREPARATION OF BIDS--CONSTRUCTION (APR 1984)

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

(b) The bid form may require bidders to submit bid prices for one or more items on various bases, including--

(1) Lump sum bidding;

(2) Alternate prices;

(3) Units of construction; or

(4) Any combination of subparagraphs (1) through (3) above.

(c) If the solicitation requires bidding on all items, failure to do so will disqualify the bid. If bidding on all items is not required, bidders should insert the words "no bid" in the space provided for any item on which no price is submitted.

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

(End of provision)

52.214-19 CONTRACT AWARD--SEALED BIDDING--CONSTRUCTION (AUG 1996)

(a) The Government will evaluate bids in response to this solicitation without discussions and will award a contract to the responsible bidder whose bid, conforming to the solicitation, will be most advantageous to the Government, considering only price and the price-related factors specified elsewhere in the solicitation.

(b) The Government may reject any or all bids, and waive informalities or minor irregularities in bids received.

(c) The Government may accept any item or combination of items, unless doing so is precluded by a restrictive limitation in the solicitation or the bid.

(d) The Government may reject a bid as nonresponsive if the prices bid are materially unbalanced between line items or subline items. A bid is materially unbalanced when it is based on prices significantly less than cost for some work and prices which are significantly overstated in relation to cost for other work, and if there is a reasonable doubt that the bid will result in the lowest overall cost to the Government even though it may be the low evaluated bid, or if it is so unbalanced as to be tantamount to allowing an advance payment.

(End of provison)

52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a Firm-Fixed Price contract resulting from this solicitation.

(End of clause)

52.217-5 EVALUATION OF OPTIONS (JUL 1990)

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

(End of provision)

52.233-2 SERVICE OF PROTEST (AUG 1996)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from Chief, Contracting Division, US Army Corps of Engineers-Alaska District, 2204 Third St, Elmendorf AFB, Alaska.

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

(End of provision)

52.236-27 SITE VISIT (CONSTRUCTION) (FEB 1995)

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

(b) An organized site visit may be arranged by the US Army Corps of Engineers. Notification of any site visit will be made in a future amendment.

(End of provision)

52.252-5 AUTHORIZED DEVIATIONS IN PROVISIONS (APR 1984)

(a) The use in this solicitation of any Federal Acquisition Regulation (48 CFR Chapter 1) provision with an authorized deviation is indicated by the addition of"(DEVIATION)" after the date of the provision.

(b) The use in this solicitation of any DFAR (48 CFR Chapter __1__) provision with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(End of provision)

252.204-7004 REQUIRED CENTRAL CONTRACTOR REGISTRATION ALTERNATE A (NOV 2003)

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

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

“Commercial and Government Entity (CAGE) code” means--

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

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

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

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

“Registered in the CCR database” means that--

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

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

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

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

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

(c) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one.

(1) An offeror may obtain a DUNS number--

(i) If located within the United States, by calling Dun and Bradstreet at 1-866-705-5711 or via the Internet at http://www.dnb.com; or

(ii) If located outside the United States, by contacting the local Dun and Bradstreet office.

(2) The offeror should be prepared to provide the following information:

(i) Company legal business.

(ii) Tradestyle, doing business, or other name by which your entity is commonly recognized.

(iii) Company Physical Street Address, City, State, and Zip Code.

(iv) Company Mailing Address, City, State and Zip Code (if separate from physical).

(v) Company Telephone Number.

(vi) Date the company was started.

(vii) Number of employees at your location.

(viii) Chief executive officer/key manager.

(ix) Line of business (industry).

(x) Company Headquarters name and address (reporting relationship within your entity).

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

(e) Processing time, which normally takes 48 hours, should be taken into consideration when registering. Offerors who are not registered should consider applying for registration immediately upon receipt of this solicitation.

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

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

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

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

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

(End of clause)

252.209-7002 DISCLOSURE OF OWNERSHIP OR CONTROL BY A FOREIGN GOVERNMENT (SEP 1994)

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

(1) "Entity controlled by a foreign government" means--

(i) Any domestic or foreign organization or corporation that is effectively owned or controlled by a foreign government; or

(ii) Any individual acting on behalf of a foreign government.

(2) "Effectively owned or controlled" means that a foreign government or any entity controlled by a foreign government has the power, either directly or indirectly, whether exercised or exercisable, to control or influence the election or appointment of the Offeror's officers, directors, partners, regents, trustees, or a majority of the Offeror's board of directors by means, e.g., ownership, contract, or operation of law.

(3) "Foreign government" means any governing body organized and existing under the laws of any country other than the United States and its possessions and trust territories and any agent or instrumentality of that government.

(4) "Proscribed information" means--

(i) Top Secret information;

(ii) Communications Security (COMSEC) information, except classified keys used to operate secure telephone unites (STU IIIs);

(iii) Restricted Data as defined in the U.S. Atomic Energy Act of 1954, as amended;

(iv) Special Access Program (SAP) information; or

(v) Sensitive Compartmental Information (SCI).

(b) Prohibition on award. No contract under a national security program may be awarded to a company owned by an entity controlled by a foreign government if that company requires access to proscribed information to perform the contract, unless the Secretary of Defense or designee has waived application of 10 U.S.C.2536(a).

(c) Disclosure.
The Offeror shall disclose any interest a foreign government has in the Offeror when that interest constitutes control by a foreign government as defined in this provision. If the Offeror is a subsidiary, it shall also disclose any reportable interest a foreign government has in any entity that owns or controls the subsidiary, including reportable interest concerning the Offeror's immediate parent, intermediate parents, and the ultimate parent. Use separate paper as needed, and provide the information in the following format:

Offeror's Point of Contact for Questions about Disclosure
(Name and Phone Number with Country Code, City Code and Area Code, as applicable)

Name and Address of Offeror

Name and Address of Entity Controlled by a Foreign Government	Description of Interest, Ownership Percentage, and Identification of Foreign Government

(End of provision)

Section 00600 - Representations & Certifications

CLAUSES INCORPORATED BY FULL TEXT

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

(a) The offeror certifies that --

(1) The prices in this offer have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other offeror or competitor relating to –

(i) Those prices,

(ii) The intention to submit an offer, or

(iii) The methods of factors used to calculate the prices offered:

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

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

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

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

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

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

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

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

(End of clause)

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

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

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

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

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

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

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

(End of provision)

52.204-3 TAXPAYER IDENTIFICATION (OCT 1998)

(a) Definitions.

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

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

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

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

(d) Taxpayer Identification Number (TIN).

___ TIN:._____

___ TIN has been applied for.

___ TIN is not required because:

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

___ Offeror is an agency or instrumentality of a foreign government;

___ Offeror is an agency or instrumentality of the Federal Government.

(e) Type of organization.

___ Sole proprietorship;

___ Partnership;

___ Corporate entity (not tax-exempt);

___ Corporate entity (tax-exempt);

___ Government entity (Federal, State, or local);

___ Foreign government;

___ International organization per 26 CFR 1.6049-4;

___ Other _____

(f) Common parent.

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

___ Name and TIN of common parent:

Name _____

TIN _____

(End of provision)

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

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

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

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

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

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

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

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

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

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

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

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

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

(End of provision)

52.219-1 SMALL BUSINESS PROGRAM REPRESENTATIONS (APR 2002) - ALTERNATE I (APR 2002)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is 237990.

(2) The small business size standard is $28,500,000.

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

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

(2) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents, for general statistical purposes, that it ( ) is, ( ) is not a small disadvantaged business concern as defined in 13 CFR 124.1002.

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

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

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

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

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

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

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

____ Black American.

____ Hispanic American.

____ Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians).

____ Asian-Pacific American (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China, Taiwan, Laos, Cambodia (Kampuchea), Vietnam, Korea, The Philippines, U.S. Trust Territory of the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, Guam, Samoa, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru).

____ Subcontinent Asian (Asian-Indian) American (persons with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal).

____ Individual/concern, other than one of the preceding.

(c) Definitions. As used in this provision--

Service-disabled veteran-owned small business concern--

(1) Means a small business concern--

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

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

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

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

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

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

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

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

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

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

(d) Notice.

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

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

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

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

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

(End of provision)

52.219-2 EQUAL LOW BIDS. (OCT 1995)

(a) This provision applies to small business concerns only.

(b) The bidder's status as a labor surplus area (LSA) concern may affect entitlement to award in case of tie bids. If the bidder wishes to be considered for this priority, the bidder must identify, in the following space, the LSA in which the costs to be incurred on account of manufacturing or production (by the bidder or the first-tier subcontractors) amount to more than 50 percent of the contract price.

_____
_____

(c) Failure to identify the labor surplus area as specified in paragraph (b) of this provision will preclude the bidder from receiving priority consideration. If the bidder is awarded a contract as a result of receiving priority consideration under this provision and would not have otherwise received award, the bidder shall perform the contract or cause the contract to be performed in accordance with the obligations of an LSA concern.

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

(a) Definition.

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

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

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

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

No. of Employees Avg. Annual Gross Revenues

____ 50 or fewer ____ $1 million or less

____ 51 - 100 ____ $1,000,001 - $2 million

____ 101 - 250 ____ $2,000,001 - $3.5 million

____ 251 - 500 ____ $3,500,001 - $5 million

____ 501 - 750 ____ $5,000,001 - $10 million

____ 751 - 1,000 ____ $10,000,001 - $17 million

____ Over 1,000 ____ Over $17 million

(End of provision)

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

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

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

No. of Employees Avg. Annual Gross Revenues

____ 50 or fewer ____ $1 million or less

____ 51 - 100 ____ $1,000,001 - $2 million

____ 101 - 250 ____ $2,000,001 - $3.5 million

____ 251 - 500 ____ $3,500,001 - $5 million

____ 501 - 750 ____ $5,000,001 - $10 million

____ 751 - 1,000 ____ $10,000,001 - $17 million

____ Over 1,000 ____ Over $17 million

(End of provision)

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

The offeror represents that --

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

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

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

(End of provision)

52.222-38 COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (DEC 2001)

By submission of its offer, the offeror represents that, if it is subject to the reporting requirements of 38 U.S.C. 4212(d) (i.e., if it has any contract containing Federal Acquisition Regulation clause 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans), it has submitted the mo st recent VETS-100 Report required by that clause.

(End of provision)

52.223-13 CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (AUG 2003)

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

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

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

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

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

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

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

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

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

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

(C) Major group codes 20 through 39.

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

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

( ) (v) The facility is not located within the United States or its outlying areas.

(End of clause)

252.209-7001 DISCLOSURE OF OWNERSHIP OR CONTROL BY THE GOVERNMENT OF A TERRORIST COUNTRY (MAR 1998)

(a) "Definitions."

As used in this provision --

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

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

(3) "Significant interest" means --

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

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

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

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

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

(b) "Prohibition on award."

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

(c) "Disclosure."

If the government of a terrorist country has a significant interest in the Offeror or a subsidiary of the Offeror, the Offeror shall disclosure such interest in an attachment to its offer. If the Offeror is a subsidiary, it shall also disclose any significant interest the government of a terrorist country has in any firm that owns or controls the subsidiary. The disclosure shall include --

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

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

(End of provision)

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

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

(b) Representation. The Offeror represents that it:

____ (1) Does anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

____ (2) Does not anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

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

(End of provision)

INDEX OF CLAUSES
W911KB-04-B-0008
SECTION 00700

52.202-0001	DEFINITIONS (MAY 2001)—ALTERNATE I (MAR 2001)
52.203-0003	GRATUITIES (APR 1984)
52.203-0005	COVENANT AGAINST CONTINGENT FEES (APR 1984)
52.203-0006	RESTRICTIONS IN SUBCONTRACTOR SALES TO THE GOVERNMENT(JUL 1995)
52.203-0007	ANTI-KICKBACK PROCEDURES (JUL 1995)
52.203-0008	CANCELLATIONS, RECISSION AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)
52.203-0010	PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)
52.203-0012	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN 2003)
52.204-0004	PRINTING/COPYING DOUBLE-SIDED ON RECYCLED PAPER (AUG 2000)
52.204-0006	DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER (OCT 2003)
52.209-0006	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTOR DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (JUL 1995)
52.211-0010	COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK (APR 1984)
52.211-0012	LIQUIDATED DAMAGES—CONSTRUCTION (SEP 2000)
52.211-0015	DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (SEP 1990)
52.214-0026	AUDIT AND RECORDS--SEALED BIDDING (OCT 1997)
52.214-0027	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATE--MODIFICATIONS-SEALED BIDDING (OCT 1997)
52.214-0028	SUBCONTRACTOR COST OR PRICING DATA-MODIFICATIONS-SEALED BIDDING (OCT 1997)
52.214-0034	SUBMISSION OF OFFERS IN THE ENGLISH LANGUAGE (APR 1991)
52.214-0035	SUBMISSION OF OFFERS IN U.S. CURRENCY (APR 1991)
52.214-5000	APPARENT CLERICAL MISTAKES (MAR 1995)--EFARS
52.219-0014	LIMITATIIONS ON SUBCONTRACTING (DEC 1996)
52.219-0017	SECTION 8(a) AWARD 9DEC 1996)
52.222-0001	NOTICE TO THE GOVERNENT OF LABOR DISPUTES (FEB 1997)
52.222-0003	CONVICT LABOR (JUN 2003)
52.222-0004	CONTRACT WORK HOURS AND SAFETY STANDARDS ACT--OVERTIME

	COMPENSATION (SEPT 2000)
52.222-0006	DAVIS-BACON ACT (FEB 1995)
52.222-0007	WITHHOLDING OF FUNDS (FEB 1988)
52.222-0008	PAYROLLS AND BASIC RECORDS (FEB 1988)
52.222-0009	APPRENTICES AND TRAINEES (FEB 1988)
52.222-0010	COMPLIANCE WITH COPELAND ACT REQUIREMENTS (FEB 1988)
52.222-0011	SUBCONTRACTS (LABOR STANDARDS) (FEB 1988)
52.222-0012	CONTRACT TERMINATION--DEBARMENT (FEB 1988)
52.222-0013	COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988)
52.222-0014	DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)
52.222-0015	CERTIFICATION OF ELIGIBILITY (FEB 1988)
52-222-0021	PROBITION OF SEGREGATE FACILITIES (FEB 1999)
52.222-0023	NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)
52.222-0026	EQUAL OPPORTUNITY (APR 2002)
52.222-0027	AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION (FEB 1999)
52.222-0035	EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA AND OTHER ELIGIBLE VETERANS(DEC 2001)
52.222-0036	AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)
52.222-0037	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA AND OTHER ELIGIBLE VETERANS (DEC 2001)
52.223-0003	HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997)
52.223-0005	POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (AUG 2003)
52.223-0006	DRUG-FREE WORKPLACE (MAY 2001)
52.223-0014	TOXIC CHEMICAL RELEASE REPORTING (AUG 2003)
52.225-0011	BUY AMERICAN ACT—CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (JAN 2004)
52.225-0012	NOTICE OF BUY AMERICAN ACT REQUIREMENT--CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (JAN 2004)
52.225-0013	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (JAN 2004)
52.227-0001	AUTHORIZATION AND CONSENT (JUL 1995)

52.227-0002	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG 1996)
52.227-0004	PATENT INDEMNITY--CONSTRUCTION CONTRACTS (APR 1984)
52.228-0001	BID GUARANTEE (SEP 1996)
52.228-0002	ADDITIONAL BOND SECURITY (OCT 1997)
52.228-0005	INSURANCE—WORK ON A GOVERNMENT INSTALLATION (JAN 1997)
52.228-0011	PLEDGES OF ASSETS (FEB 1992)
52.228-0012	PROSPECTIVE SUBCONTRACTOR REQUESTS FOR BONDS (OCT 1995)
52.228-0014	IRREVOCABLE LETTER OF CREDIT (DEC 1999)
52.228-0015	PERFORMANCE AND PAYMENT BONDS--CONSTRUCTION (JUL 2000)
52.229-0003	FEDERAL, STATE, AND LOCAL TAXES (APR 2003)
51.231-5000	EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (MAR 1995)--EFARS
52.232-0005	PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (SEP 2002)
52.232-0017	INTEREST (JUN 1996)
52.232-0018	AVAILABILITY OF FUNDS (APR 1984)
52.232-0023	ASSIGNMENT OF CLAIMS (JAN 1986)
52.232-0027	PROMPT PAYMENT FOR CONSTRUCTION CONTRACTS (OCT 2003)
52.232-0033	PAYMENTS BY ELECTRONIC FUNDS TRANSFER - CENTRAL CONTRACTOR REGINSTRATION (OCT 2003)
52.233-0001	DISPUTES (JUL 2002)
52.233-0003	PROTEST AFTER AWARD (AUG 1996)
52.236-0002	DIFFERING SITE CONDITIONS (APR 1984)
52.236-0003	SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984)
52.236-0005	MATERIAL AND WORKMANSHIP (APR 1984)
52.236-0006	SUPERINTENDENCE BY THE CONTRACTOR (APR 1984)
52.236-0007	PERMITS AND RESPONSIBILITIES (NOV 1991)
52.236-0008	OTHER CONTRACTS (APR 1984)
52.236-0009	PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (APR 1984)
52.236-0010	OPERATIONS AND STORAGE AREAS (APR 1984)
52.236-0011	USE AND POSSESSION PRIOR TO COMPLETION (APR 1984)

52.236-0012	CLEANING UP (APR 1984)
52.236-0013	ACCIDENT PREVENTION (NOV 1991)
52.236-0014	AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984)
52.236-0015	SCHEDULES FOR CONSTRUCTION CONTRACTS (APR 1984)
52.236-0017	LAYOUT OF WORK (APR 1984)
52.236-0021	SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB 1997)
52.236-0026	PRECONSTRUCTION CONFERENCE (FEB 1995)
52.242-0013	BANKRUPTCY (JUL 1995)
52.242-0014	SUSPENSION OF WORK (APR 1984)
52.243-0004	CHANGES (AUG 1987)
52.245-0001	PROPERTY RECORDS (APR 1984)
52.246-0012	INSPECTION OF CONSTRUCTION (AUG 1996)
52.246-0021	WARRANTY OF CONSTRUCTIION(MAR 1994)
52.248-0003	VALUE ENGINEERING--CONSTRUCTION (FEB 2000)
52.249-0002	TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (SEP 1996) - ALTERNATE I (SEP 1996)
52.249-0010	DEFAULT (FIXED-PRICE CONSTRUCTION) (APR 1984)
52.253-0001	COMPUTER GENERATED FORMS (JAN 1991)
252.201-7000	CONTRACTING OFFICER'S REPRESENTATIVE (DEC 1991)
252.203-7001	PROHIBITIONS ON PERSON CONVICTED OF FRAUD OR OTHER DEFENSE-CONTRACT-RELATED FELONIES (MAR 1999)
52.203-7002	DISPLAY OF DOD HOTLINE POSTER (DEC 1991)
252.204-7000	DISCLOSURE OF INFORMATION (DEC 1991)
252-204-7003	CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT (APR 1992)
252.209-7000	ACQUISITION FROM SUBCONTRACTORS SUBJECT OT ONSITE INSPECTION UNDER THE INTERMEDIATE-RANGE NUCLEAR FORCES (INF)TREATY (NOV 1995)
252.209-7004	SUBCONTRACTING WITH FIRMS THAT ARE OWNED OE CONTROLLED BY THE GOVERNMENT OF A TERRORIST COUNTRY (MAR 1998)
252.219-7009	SECTION 8(A) DIRECT AWARD (MAR 2002)
252.219-7010	ALTERNATE A (JUL 1998)
252.222-7000	RESTRICTIONS ON EMPLOYMENT OF PERSONNEL (MAR 2000)
252.223-7001	HAZARD WARNING LABELS (DEC 1991)

252.223-7004	DRUG FREE WORK FORCE (SEP 1988)
252.223-7006	PROHIBITION ON STORAGE AND DISPOSAL OF TOXIC AND HAZARDOUS MATERIALS (APR 1993)
252.225-7031	SECONDARY ARAB BOYCOTT OF ISRAEL (APR 2003)
252-226-7001	UTILIZATION OF INDIAN ORGANIZATIONS AND INDIAN-OWNED ECONOMIC ENTERPRISES AND HAWAIIAN SMALL BUSINESS CONCERNS (OCT 2003)
252.227-7033	RIGHTS IN SHOP DRAWINGS (APR 1966)
252.231-7000	SUPPLEMENTAL COST PRINCIPLES (DEC 1991)
252.236-7000	MODIFICATION PROPOSALS-PRICE BREAKDOWN (DEC 1991)
252.236-7001	CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS(AUG 2000)
252.236-7008	CONTRACT PRICES--BIDDING SCHEDULES (DEC 1991)
252.242-7000	POSTAWARD CONFERENCE (DEC 1991)
252.243-7001	PRICING OF CONTRACT MODIFICATIONS (DEC 1991)
252.243-7002	REQUEST FOR EQUITABLE ADJUSTMENT (MAR 1998)
252.247-7023	TRANSPORTATION OF SUPPLIES BY SEA (MAY 2002)
252.247-7024	NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)

Section 00700 - Contract Clauses

CLAUSES INCORPORATED BY FULL TEXT

52.202-1 DEFINITIONS (MAY 2001) --ALTERNATE I (MAR 2001)

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

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

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

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

(e) Nondevelopmental item means--

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

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

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

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

(g) Except as otherwise provided in this contract, the term "subcontracts" includes, but is not limited to, purchase orders and changes and modifications to purchase orders under this contract.

(End of clause)

52.203-3 GRATUITIES (APR 1984)

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

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

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

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

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

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

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

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

(End of clause)

52.203-5 COVENANT AGAINST CONTINGENT FEES (APR 1984)

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

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

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

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

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

(End of clause)

52.203-6 RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT (JUL 1995)

(a) Except as provided in (b) of this clause, the Contractor shall not enter into any agreement with an actual or prospective subcontractor, nor otherwise act in any manner, which has or may have the effect of restricting sales by such subcontractors directly to the Government of any item or process (including computer software) made or furnished by the subcontractor under this contract or under any follow-on production contract.

(b) The prohibition in (a) of this clause does not preclude the Contractor from asserting rights that are otherwise authorized by law or regulation.

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

52.203-7 ANTI-KICKBACK PROCEDURES. (JUL 1995)

(a) Definitions.

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

"Person," as used in this clause, means a corporation, partnership, business association of any kind, trust, joint-stock company, or individual.

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

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

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

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

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

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

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

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

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

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

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

(2) When the Contractor has reasonable grounds to believe that a violation described in paragraph (b) of this clause

may have occurred, the Contractor shall promptly report in writing the possible violation. Such reports shall be made to the inspector general of the contracting agency, the head of the contracting agency if the agency does not have an inspector general, or the Department of Justice.

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

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

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

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

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

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

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

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

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

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

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

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

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

(End of clause)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(End of clause)

52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN 2003)

(a) Definitions.

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

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

(1) The awarding of any Federal contract.

(2) The making of any Federal grant.

(3) The making of any Federal loan.

(4) The entering into of any cooperative agreement.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(b) Prohibitions.

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

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

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

(i) Agency and legislative liaison by own employees.

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

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

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

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

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

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

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

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

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

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

(ii) Professional and technical services.

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

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

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

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

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

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

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

(c) Disclosure.

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

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

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

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

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

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

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

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

(e) Penalties.

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

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

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

(End of clause)

52.204-4 PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER (AUG 2000)

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

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

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

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

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

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

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

(1) Postconsumer fiber; and

(2) Manufacturing wastes such as--

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

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

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

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

(End of clause)

52.204-6 DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER (OCT 2003)

(a) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation “DUNS” or “DUNS+4” followed by the DUNS number or “DUNS+4” that identifies the offeror's name and address

exactly as stated in the offer. The DUNS number is a nine-digit number assigned by Dun and Bradstreet, Inc. The DUNS+4 is the DUNS number plus a 4-character suffix that may be assigned at the discretion of the offeror to establish additional CCR records for identifying alternative Electronic Funds Transfer (EFT) accounts (see Subpart 32.11) for the same parent concern.

(b) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one.

(1) An offeror may obtain a DUNS number--

(i) If located within the United States, by calling Dun and Bradstreet at 1-866-705-5711 or via the Internet at http://www.dnb.com; or

(ii) If located outside the United States, by contacting the local Dun and Bradstreet office.

(2) The offeror should be prepared to provide the following information:

(i) Company legal business name.

(ii) Tradestyle, doing business, or other name by which your entity is commonly recognized.

(iii) Company physical street address, city, state and Zip Code.

(iv) Company mailing address, city, state and Zip Code (if separate from physical).

(v) Company telephone number.

(vi) Date the company was started.

(vii) Number of employees at your location.

(viii) Chief executive officer/key manager.

(ix) Line of business (industry).

(x) Company Headquarters name and address (reporting relationship within your entity).

(End of provision)

52.209-6 PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (JUL 1995)

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

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

(c) A corporate officer or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is debarred, suspended, or proposed for debarment (see FAR 9.404 for

information on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs). The notice must include the following:

(1) The name of the subcontractor.

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

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

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

(End of clause)

52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall be required to

(a) commence work under this contract with ten (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 30 September 2006.

The completion date is based on the assumption that the successful offeror will receive the Notice to Proceed by 27 September 2004. The completion date will be extended by the number of calendar days after the above date that the Contractor receives the Notice to Proceed, except to the extent that the delay in issuance of the Notice to Proceed results from the failure of the Contractor to execute the contract and give the required performance and payment bonds within the time specified in the offer. The time stated for completion shall include final cleanup of the premises.

(End of Clause)

52.211-12 LIQUIDATED DAMAGES--CONSTRUCTION (SEP 2000)

(a) If the Contractor fails to complete the work within the time specified in the contract, the Contractor shall pay liquidated damages to the Government in the amount of $1018.00 for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until

the work is completed. These liquidated damages are in addition to exc ess costs of repurchase under the Termination clause.

(End of clause)

52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (SEP 1990)

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

(End of clause)

52.214-26 AUDIT AND RECORDS--SEALED BIDDING. (OCT 1997)

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

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

(1) The proposal for the modification;

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

(3) Pricing of the modification; or

(4) Performance of the modification.

(c) Comptroller General. In the case of pricing any modification, the Comptroller General of the United States, or an authorized representative, shall have the same rights as specified in paragraph (b) of this clause.

(d) Availability. The Contractor shall make available at its office at all reasonable times the materials described in reproduction, until 3 years after final payment under this contract, or for any other period specified in Subpart 4.7 of the Federal Acquisition Regulation (FAR). FAR Subpart 4.7, Contractor Records Retention, in effect on the data of this contract, is incorporated by reference in its entirety and made a part of this contract.

(1) If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement.

(2) Records pertaining to appeals under the Disputes clause or to litigation or the settlement of claims arising under or relating to the performance of this contract shall be made available until disposition of such appeals, litigation, or claims.

(e) The Contractor shall insert a clause containing all the provisions of this clause, including this paragraph (e), in all subcontracts expected to exceed the threshold in FAR 15.403-4(a)(1) for submission of cost or pricing data.

(End of clause)

52.214-27 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA - MODIFICATIONS - SEALED BIDDING. (OCT 1997)

(a) This clause shall become operative only for any modification to this contract involving aggregate increases and/or decreases in costs, plus applicable profits, expected to exceed the threshold for the submission of cost or pricing data at FAR 15.403-4(a)(1), except that this clause does not apply to a modification if an exception under FAR 15.403-1(b) applies.

(1) Based on adequate price competition;

(2) Based on established catalog or market prices of commercial items sold in substantial quantities to the general public; or

(3) Set by law or regulation.

(b) If any price, including profit, negotiated in connection with any modification under this clause, was increased by any significant amount because

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

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

(3) any of these parties furnished data of any description that were not accurate, the price shall be reduced accordingly and the contract shall be modified to reflect the reduction. This right to a price reduction is limited to that resulting from defects in data relating to modifications for which this clause becomes operative under paragraph (a) above.

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

(1) the actual subcontract; or

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

(d) If the Contracting Officer determines under paragraph (b) of this clause that a price or cost reduction should be made:

(1) the Contractor agrees not to raise the following matters as a defense:

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

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

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

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

(2) Except as prohibited by subdivision (d)(2)(ii) of this clause:

(i) an offset in an amount determined appropriate by the Contracting Officer based upon the facts shall be allowed against the amount of a contract price reduction if:

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

(B) The Contractor proves that the cost or pricing data were available before the date of agreement on the price of the contract (or price of the modification) and that the data were not submitted before such date.

(ii) An offset shall not be allowed if:

(A) The understated data was known by the Contractor to be understated when the Certificate of Current Cost or Pricing Data was signed; or (B) The Government proves that the facts demonstrate that the contract price would not have increased in the amount to be offset even if the available data had been submitted before the date of agreement on price.

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

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

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

(End of clause)

52.214-28 SUBCONTRACTOR COST OR PRICING DATA - MODIFICATIONS - SEALED BIDDING. (OCT 1997)

(a) The requirements of paragraphs (b) and (c) of this clause shall:

(1) become operative only for any modification to this contract involving aggregate increases and/or decreases in costs, plus applicable profits, expected to exceed the threshold for submission of cost or pricing data at (FAR) 48 CFR 15.403-4(a)(1); and

(2) be limited to such modifications.

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

(1) Based on adequate price competition;

(2) Based on established catalog or market prices of commercial items sold in substantial quantities to the general public; or

(3) Set by law or regulation.

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

(d) The Contractor shall insert the substance of this clause, including this paragraph (d), in each subcontract that, when entered into, exceeds the threshold for submission of cost or pricing data at FAR 15.403-4(a)(1).

(End of clause)

52.214-34 SUBMISSION OF OFFERS IN THE ENGLISH LANGUAGE (APR 1991)

Offers submitted in response to this solicitation shall be in the English language. Offers received in other than English shall be rejected.

(End of provision)

52.214-35 SUBMISSION OF OFFERS IN U.S. CURRENCY (APR 1991)

Offers submitted in response to this solicitation shall be in terms of U.S. dollars. Offers received in other than U.S. dollars shall be rejected.

(End of provision)

52.214-5000 APPARENT CLERICAL MISTAKES (MAR 1995)--EFARS

(a) For the purpose of initial evaluations of bids, the following will be utilized in the resolving arithmetic discrepancies found on the face of bidding schedule as submitted by the bidder:

(1) Obviously misplaced decimal points will be corrected;

(2) Discrepancy between unit price and extended price, the unit price will govern;

(3) Apparent errors in extension of unit prices will be corrected;

(4) Apparent errors in addition of lump-sum and extended prices will be corrected.

(b) For the purpose of bid evaluation, the government will proceed on the assumption that the bidder intends his bid to be evaluated on basis of the unit prices, the totals arrived at by resolution of arithmetic discrepancies as provided above and the bid will be so reflected on the abstract of bids.

(c) These correction procedures shall not be used to resolve any ambiguity concerning which bid is low.

(End of statement)

52.219-8 UTILIZATION OF SMALL BUSINESS CONCERNS (MAY 2004)

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

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

Definitions. As used in this contract--

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

Service-disabled veteran-owned small business concern--

(1) Means a small business concern--

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(d) Contractors acting in good faith may rely on written representations by their subcontractors regarding their status as a small business concern, a veteran-owned small business concern, a service-disabled veteran-owned small business concern, a HUBZone small business concern, a small disadvantaged business concern, or a women-owned small business concern.

(End of clause)

52.219-14 LIMITATIONS ON SUBCONTRACTING (DEC 1996)

(a) This clause does not apply to the unrestricted portion of a partial set-aside.

(b) By submission of an offer and execution of a contract, the Offeror/Contractor agrees that in performance of the contract in the case of a contract for--

(1) Services (except construction). At least 50 percent of the cost of contract performance incurred for personnel shall be expended for employees of the concern.

(2) Supplies (other than procurement from a nonmanufacturer of such supplies). The concern shall perform work for at least 50 percent of the cost of manufacturing the supplies, not including the cost of materials.

(3) General construction. The concern will perform at least 15 percent of the cost of the contract, not including the cost of materials, with its own employees.

(4) Construction by special trade contractors. The concern will perform at least 25 percent of the cost of the contract, not including the cost of materials, with its own employees.

52.219-17 SECTION 8(a) AWARD (DEC 1996)

(a) By execution of a contract, the Small Business Administration (SBA) agrees to the following:

(1) ~~To furnish the supplies or services set forth in the contract according to the specifications and the terms and conditions by subcontracting with the Offeror who has been determined an eligible concern pursuant to the provisions of section 8(a) of the Small Business Act, as amended (15 U.S.C. 637(a))~~. PER SBA

(2) Except for novation agreements and advance payments, delegates to the US Army Corps of Engineers-Alaska District the responsibility for administering the contract with complete authority to take any action on behalf of the Government under the terms and conditions of the contract; provided, however that the contracting agency shall give advance notice to the SBA before it issues a final notice terminating the right of the subcontractor to proceed with further performance, either in whole or in part, under the contract.

(3) That payments to be made under the contract will be made directly to the subcontractor by the contracting activity.

(4) To notify the US Army Corps of Engineers-Alaska District Contracting Officer immediately upon notification by the subcontractor that the owner or owners upon whom 8(a) eligibility was based plan to relinquish ownership or control of the concern.

(5) That the subcontractor awarded a subcontract hereunder shall have the right of appeal from decisions of the cognizant Contracting Officer under the “Disputes” clause of the subcontract.

The offeror/subcontractor agrees and acknowledges that it will, for and on behalf of the SBA, fulfill and perform all of the requirements of the contract.

(c) The offeror/subcontractor agrees that it will not subcontract the performance of any of the requirements of this subcontract to any lower tier subcontractor without the prior written approval of the SBA and the cognizant Contracting Officer of the US Army Corps of Engineers-Alaska District.

52.222-1 NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (FEB 1997)

If the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the Contractor shall immediately give notice, including all relevant information, to the Contracting Officer.

(End of clause)

52.222-3 CONVICT LABOR (JUN 2003)

(a) Except as provided in paragraph (b) of this clause, the Contractor shall not employ in the performance of this contract any person undergoing a sentence of imprisonment imposed by any court of a State, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, or the U.S. Virgin Islands.

(b) The Contractor is not prohibited from employing persons--

(1) On parole or probation to work at paid employment during the term of their sentence;

(2) Who have been pardoned or who have served their terms; or

(3) Confined for violation of the laws of any of the States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, or the U.S. Virgin Islands who are authorized to work at paid employment in the community under the laws of such jurisdiction, if--

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

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

(iii) Such paid employment will not result in the displacement of employed workers, or be applied in skills, crafts, or trades in which there is a surplus of available gainful labor in the locality, or impair existing contracts for services;

(iv) The rates of pay and other conditions of employment will not be less than those paid or provided for work of a similar nature in the locality in which the work is being performed; and

(v) The Attorney General of the United States has certified that the work-release laws or **regulations** of the jurisdiction involved are in conformity with the requirements of Executive Order 11755, as amended by Executive Orders 12608 and 12943.

(End of clause)

52.222-4 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT - OVERTIME COMPENSATION. (SEP 2000)

(a) Overtime requirements. No Contractor or subcontractor employing laborers or mechanics (see Federal Acquisition Regulation 22.300) shall require or permit them to work over 40 hours in any workweek unless they are paid at least 1 and 1/2 times the basic rate of pay for each hour worked over 40 hours.

(b) Violation; liability for unpaid wages; liquidated damages. The responsible Contractor and subcontractor are liable for unpaid wages if they violate the terms in paragraph (a) of this clause. In addition, the Contractor and subcontractor are liable for liquidated damages payable to the Government. The Contracting Officer will assess liquidated damages at the rate of $10 per affected employee for each calendar day on which the employer required or permitted the employee to work in excess of the standard workweek of 40 hours without paying overtime wages required by the Contract Work Hours and Safety Standards Act.

(c) Withholding for unpaid wages and liquidated damages. The Contracting Officer will withhold from payments due under the contract sufficient funds required to satisfy any Contractor or subcontractor liabilities for unpaid wages and liquidated damages. If amounts withheld under the contract are insufficient to satisfy Contractor or subcontractor liabilities, the Contracting Officer will withhold payments from other Federal or Federally assisted contracts held by the same Contractor that are subject to the Contract Work Hours and Safety Standards Act.

(d) Payrolls and basic records.

(1) The Contractor and its subcontractors shall maintain payrolls and basic payroll records for all laborers and mechanics working on the contract during the contract and shall make them available to the Government until 3 years after contract completion. The records shall contain the name and address of each employee, social security number,

labor classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. The records need not duplicate those required for construction work by Department of Labor regulations at 29 CFR 5.5(a)(3) implementing the Davis-Bacon Act.

(2) The Contractor and its subcontractors shall allow authorized representatives of the Contracting Officer or the Department of Labor to inspect, copy, or transcribe records maintained under paragraph (d)(1) of this clause. The Contractor or subcontractor also shall allow authorized representatives of the Contracting Officer or Department of Labor to interview employees in the workplace during working hours.

(e) Subcontracts. The Contractor shall insert the provisions set forth in paragraphs (a) through (d) of this clause in subcontracts exceeding $100,000 and require subcontractors to include these provisions in any lower tier subcontracts. The Contractor shall be responsible for compliance by any subcontractor or lower-tier subcontractor with the provisions set forth in paragraphs (a) through (d) of this clause.

(End of clause)

52.222-6 DAVIS-BACON ACT (FEB 1995)

(a) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (d) of this clause; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such period. Such laborers and mechanics shall be paid not less than the appropriate wage rate and fringe benefits in the wage determination for the classification of work actually performed, without regard to skill, except as provided in the clause entitled Apprentices and Trainees. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph (b) of this clause) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(b)(1) The Contracting Officer shall require that any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The Contracting Officer shall approve an additional classification and wage rate and fringe benefits therefor only when all the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination.

(ii) The classification is utilized in the area by the construction industry.

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the Contracting Officer agree on the classification and wage rate (including the amount designated for fringe benefits, where appropriate), a report of the action taken shall be sent by the Contracting Officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator or an authorized representative will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(3) In the event the Contractor, the laborers or mechanics to be employed in the classification, or their representatives, and the Contracting Officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the Contracting Officer shall refer the questions, including the views of all interested parties and the recommendation of the Contracting Officer, to the Administrator of the Wage and Hour Division for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits, where appropriate) determined pursuant to subparagraphs (b)(2) and (b)(3) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(c) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(2) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, That the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(End of clause)

52.222-7 WITHHOLDING OF FUNDS (FEB 1988)

The Contracting Officer shall, upon his or her own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same Prime Contractor, or any other Federally assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same Prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the Contracting Officer may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(End of clause)

52.222-8 PAYROLLS AND BASIC RECORDS (FEB 1988)

(a) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of 3 years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found, under paragraph (d) of the clause entitled Davis-Bacon Act, that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(b)(1) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Contracting Officer. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under paragraph (a) of this clause. This information may be submitted in any form desired. Optional Form WH-347 (Federal Stock Number 029-005-00014-1) is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. The Prime Contractor is responsible for the submission of copies of payrolls by all subcontractors.

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify--

(i) That the payroll for the payroll period contains the information required to be maintained under paragraph (a) of this clause and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR Part 3; and

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph (b)(2) of this clause.

(4) The falsification of any of the certifications in this clause may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 3729 of Title 31 of the United States Code.

(c) The Contractor or subcontractor shall make the records required under paragraph (a) of this clause available for inspection, copying, or transcription by the Contracting Officer or authorized representatives of the Contracting Officer or the Department of Labor. The Contractor or subcontractor shall permit the Contracting Officer or representatives of the Contracting Officer or the Department of Labor to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit required records or to make them available, the Contracting Officer may, after written notice to the Contractor, take such action as may be necessary to cause the

suspension of any further payment. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(End of clause)

52.222-9 APPRENTICES AND TRAINEES (FEB 1988)

(a) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in this paragraph, shall be paid not less than the applicable wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(b) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed in the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate in the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate in the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(c) Equal employment opportunity. The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

(End of clause)

52.222-10 COMPLIANCE WITH COPELAND ACT REQUIREMENTS (FEB 1988)

The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.

(End of clause)

52.222-11 SUBCONTRACTS (LABOR STANDARDS (FEB 1988)

(a) The Contractor or subcontractor shall insert in any subcontracts the clauses entitled Davis -Bacon Act, Contract Work Hours and Safety Standards Act-Overtime Compensation, Apprentices and Trainees, Payrolls and Basic Records, Compliance with Copeland Act Requirements, Withholding of Funds, Subcontracts (Labor Standards), Contract Termination-Debarment, Disputes Concerning Labor Standards, Compliance with Davis -Bacon and Related Act Regulations, and Certification of Eligibility, and such other clauses as the Contracting Officer may, by appropriate instructions, require, and also a clause requiring subcontractors to include these clauses in any lower tier subcontracts. The Prime Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with all the contract clauses cited in this paragraph.

(b)(1) Within 14 days after award of the contract, the Contractor shall deliver to the Contracting Officer a completed Statement and Acknowledgment Form (SF 1413) for each subcontract, including the subcontractor's signed and dated acknowledgment that the clauses set forth in paragraph (a) of this clause have been included in the subcontract.

(ii) Within 14 days after the award of any subsequently awarded subcontract the Contractor shall deliver to the Contracting Officer an updated completed SF 1413 for such additional subcontract.

(End of clause)

52.222-12 CONTRACT TERMINATION--DEBARMENT (FEB 1988)

A breach of the contract clauses entitled Davis -Bacon Act, Contract Work Hours and Safety Standards Act--Overtime Compensation, Apprentices and Trainees, Payrolls and Basic Records, Compliance with Copeland Act Requirements, Subcontracts (Labor Standards), Compliance with Davis -Bacon and Related Act Regulations, or Certification of Eligibility may be grounds for termination of the contract, and for debarment as a Contractor and subcontractor as provided in 29 CFR 5.12.

(End of clause)

52.222-13 COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988)

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are hereby incorporated by reference in this contract.

(End of clause)

52.222-14 DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)

The United States Department of Labor has set forth in 29 CFR Parts 5, 6, and 7 procedures for resolving disputes concerning labor standards requirements. Such disputes shall be resolved in accordance with those procedures and not the Disputes clause of this contract. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

(End of clause)

52.222-15 CERTIFICATION OF ELIGIBILITY (FEB 1988)

(a) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(b) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(3) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

(End of clause)

52.222-21 PROHIBITION OF SEGREGATED FACILITIES (FEB 1999)

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

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

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

(End of clause)

52.222-23 NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for minority participation for each trade	Goals for female participation for each trade
8.7% (Anchorage, Alaska) 15.1% (Locations Outside City of Anchorage)	6.9% (Alaska)

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the --

(1) Name, address, and telephone number of the subcontractor;

(2) Employer's identification number of the subcontractor;

(3) Estimated dollar amount of the subcontract;

(4) Estimated starting and completion dates of the subcontract; and

(5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is Ft Wainwright,

Alaska, Fairbanks, North Star Borough

(End of provision)

52.222-26 EQUAL OPPORTUNITY (APR 2002)

(a) Definition. United States, as used in this clause, means the 50 States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, and Wake Island.

(b) If, during any 12-month period (including the 12 months preceding the award of this contract), the Contractor has been or is awarded nonexempt Federal contracts and/or subcontracts that have an aggregate value in excess of $10,000, the Contractor shall comply with paragraphs (b)(1) through (b)(11) of this clause, except for work performed outside the United States by employees who were not recruited within the United States. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.

(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. However, it shall not be a violation of this clause for the Contractor to extend a publicly announced preference in employment to Indians living on or near an Indian reservation, in connection with employment opportunities on or near an Indian reservation, as permitted by 41 CFR 60-1.5.

(2) The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. This shall include, but not be limited to, (i) employment, (ii) upgrading, (iii) demotion, (iv) transfer, (v) recruitment or recruitment advertising, (vi) layoff or termination, (vii) rates of pay or other forms of compensation, and (viii) selection for training, including apprenticeship.

(3) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.

(4) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(5) The Contractor shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

(6) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.

(7) The Contractor shall furnish to the contracting agency all information required by Executive Order 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. The Contractor shall also file Standard Form 100 (EEO-1), or any successor form, as prescribed in 41 CFR part 60-1. Unless the Contractor has filed within the 12 months preceding the date of contract award, the Contractor shall, within 30 days after contract award, apply to either the regional Office of Federal Contract Compliance Programs (OFCCP) or the local office of the Equal Employment Opportunity Commission for the necessary forms.

(8) The Contractor shall permit access to its premises, during normal business hours, by the contracting agency or the OFCCP for the purpose of conducting on-site compliance evaluations and complaint investigations. The Contractor shall permit the Government to inspect and copy any books, accounts, records (including computerized

records), and other material that may be relevant to the matter under investigation and pertinent to compliance with Executive Order 11246, as amended, and rules and regulations that implement the Executive Order.

(9) If the OFCCP determines that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts, under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended; in the rules, regulations, and orders of the Secretary of Labor; or as otherwise provided by law.

(10) The Contractor shall include the terms and conditions of subparagraphs (b)(1) through (11) of this clause in every subcontract or purchase order that is not exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor.

(11) The Contractor shall take such action with respect to any subcontract or purchase order as the contracting officer may direct as a means of enforcing these terms and conditions, including sanctions for noncompliance; provided, that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of any direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

(c) Notwithstanding any other clause in this contract, disputes relative to this clause will be governed by the procedures in 41 CFR 60-1.1.

(End of clause)

52.222-27 AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION (FEB 1999)

(a) Definitions. "Covered area," as used in this clause, means the geographical area described in the solicitation for this contract.

"Deputy Assistant Secretary," as used in this clause, means Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, or a designee.

"Employer's identification number," as used in this clause, means the Federal Social Security number used on the employer's quarterly federal tax return, U.S. Treasury Department Form 941.

"Minority," as used in this clause, means--

(1) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

(2) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands);

(3) Black (all persons having origins in any of the black African racial groups not of Hispanic origin); and

(4) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race).

(b) If the Contractor, or a subcontractor at any tier, subcontracts a portion of the work involving any construction

trade, each such subcontract in excess of $10,000 shall include this clause and the Notice containing the goals for minority and female participation stated in the solicitation for this contract.

(c) If the Contractor is participating in a Hometown Plan (41 CFR 60-4) approved by the U.S. Department of Labor in a covered area, either individually or through an association, its affirmative action obligations on all work in the plan area (including goals) shall comply with the plan for those trades that have unions participating in the plan. Contractors must be able to demonstrate participation in, and compliance with, the provisions of the plan. Each Contractor or subcontractor participating in an approved plan is also required to comply with its obligations under the Equal Opportunity clause, and to make a good faith effort to achieve each goal under the plan in each trade in which it has employees. The overall good-faith performance by other Contractors or subcontractors toward a goal in an approved plan does not excuse any Contractor's or subcontractor's failure to make good-faith efforts to achieve the plan's goals.

(d) The Contractor shall implement the affirmative action procedures in subparagraphs (g)(1) through (16) of this clause. The goals stated in the solicitation for this contract are expressed as percentages of the total hours of employment and training of minority and female utilization that the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where that work is actually performed. The Contractor is expected to make substantially uniform progress toward its goals in each craft.

(e) Neither the terms and conditions of any collective bargaining agreement, nor the failure by a union with which the Contractor has a collective bargaining agreement, to refer minorities or women shall excuse the Contractor's obligations under this clause, Executive Order 11246, as amended, or the regulations thereunder.

(f) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

(g) The Contractor shall take affirmative action to ensure equal employment opportunity. The evaluation of the Contractor's compliance with this clause shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and implement affirmative action steps at least as extensive as the following:

(1) Ensure a working environment free of harassment, intimidation, and coercion at all sites and in all facilities where the Contractor's employees are assigned to work. The Contractor, if possible, will assign two or more women to each construction project. The Contractor shall ensure that foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at these sites or facilities.

(2) Establish and maintain a current list of sources for minority and female recruitment. Provide written notification to minority and female recruitment sources and community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

(3) Establish and maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant, referrals of minorities or females from unions, recruitment sources, or community organizations, and the action taken with respect to each individual. If an individual was sent to the union hiring hall for referral and not referred back to the Contractor by the union or, if referred back, not employed by the Contractor, this shall be documented in the file, along with whatever additional actions the Contractor may have taken.

(4) Immediately notify the Deputy Assistant Secretary when the union or unions with which the Contractor has a collective bargaining agreement has not referred back to the Contractor a minority or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

(5) Develop on-the-job training opportunities and/or participate in training programs for the area that expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under subparagraph (g)(2) of this clause.

(6) Disseminate the Contractor's equal employment policy by--

(i) Providing notice of the policy to unions and to training, recruitment, and outreach programs, and requesting their cooperation in assisting the Contractor in meeting its contract obligations;

(ii) Including the policy in any policy manual and in collective bargaining agreements;

(iii) Publicizing the policy in the company newspaper, annual report, etc.;

(iv) Reviewing the policy with all management personnel and with all minority and female employees at least once a year; and

(v) Posting the policy on bulletin boards accessible to employees at each location where construction work is performed.

(7) Review, at least annually, the Contractor's equal employment policy and affirmative action obligations with all employees having responsibility for hiring, assignment, layoff, termination, or other employment decisions. Conduct review of this policy with all on-site supervisory personnel before initiating construction work at a job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

(8) Disseminate the Contractor's equal employment policy externally by including it in any advertising in the news media, specifically including minority and female news media. Provide written notification to, and discuss this policy with, other Contractors and subcontractors with which the Contractor does or anticipates doing business.

(9) Direct recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students, and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than 1 month before the date for acceptance of applications for apprenticeship or training by any recruitment source, send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

(10) Encourage present minority and female employees to recruit minority persons and women. Where reasonable, provide after-school, summer, and vacation employment to minority and female youth both on the site and in other areas of the Contractor's workforce.

(11) Validate all tests and other selection requirements where required under 41 CFR 60-3.

(12) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities. Encourage these employees to seek or to prepare for, through appropriate training, etc., opportunities for promotion.

(13) Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment-related activities to ensure that the

Contractor's obligations under this contract are being carried out.

(14) Ensure that all facilities and company activities are nonsegregated except that separate or single-user rest rooms and necessary dressing or sleeping areas shall be provided to assure privacy between the sexes.

(15) Maintain a record of solicitations for subcontracts for minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

(16) Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's equal employment policy and affirmative action obligations.

(h) The Contractor is encouraged to participate in voluntary associations that may assist in fulfilling one or more of the affirmative action obligations contained in subparagraphs (g)(1) through (16) of this clause. The efforts of a contractor association, joint contractor-union, contractor-community, or similar group of which the contractor is a member and participant may be asserted as fulfilling one or more of its obligations under subparagraphs (g)(1) through (16) of this clause, provided the Contractor--

(1) Actively participates in the group;

(2) Makes every effort to ensure that the group has a positive impact on the employment of minorities and women in the industry;

(3) Ensures that concrete benefits of the program are reflected in the Contractor's minority and female workforce participation;

(4) Makes a good-faith effort to meet its individual goals and timetables; and

(5) Can provide access to documentation that demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply is the Contractor's, and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

(i) A single goal for minorities and a separate single goal for women shall be established. The Contractor is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and nonminority. Consequently, the Contractor may be in violation of Executive Order 11246, as amended, if a particular group is employed in a substantially disparate manner.

(j) The Contractor shall not use goals or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

(k) The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts under Executive Order 11246, as amended.

(l) The Contractor shall carry out such sanctions and penalties for violation of this clause and of the Equal Opportunity clause, including suspension, termination, and cancellation of existing subcontracts, as may be imposed or ordered under Executive Order 11246, as amended, and its implementing regulations, by the OFCCP. Any failure to carry out these sanctions and penalties as ordered shall be a violation of this clause and Executive Order 11246, as amended.

(m) The Contractor in fulfilling its obligations under this clause shall implement affirmative action procedures at least as extensive as those prescribed in paragraph (g) of this clause, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of Executive Order 11246, as amended, the implementing regulations, or this clause, the Deputy Assistant Secretary shall take action as

prescribed in 41 CFR 60-4.8.

(n) The Contractor shall designate a responsible official to--

(1) Monitor all employment-related activity to ensure that the Contractor's equal employment policy is being carried out;

(2) Submit reports as may be required by the Government; and

(3) Keep records that shall at least include for each employee the name, address, telephone number, construction trade, union affiliation (if any), employee identification number, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, separate records are not required to be maintained.

Nothing contained herein shall be construed as a limitation upon the application of other laws that establish different standards of compliance or upon the requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

(End of clause)

52.222-35 EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)

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

All employment openings means all positions except executive and top management, those positions that will be filled from within the Contractor's organization, and positions lasting 3 days or less. This term includes full-time employment, temporary employment of more than 3 days duration, and part-time employment.

Executive and top management means any employee--

(1) Whose primary duty consists of the management of the enterprise in which the individual is employed or of a customarily recognized department or subdivision thereof;

(2) Who customarily and regularly directs the work of two or more other employees;

(3) Who has the authority to hire or fire other employees or whose suggestions and recommendations as to the hiring or firing and as to the advancement and promotion or any other change of status of other employees will be given particular weight;

(4) Who customarily and regularly exercises discretionary powers; and

(5) Who does not devote more than 20 percent or, in the case of an employee of a retail or service establishment, who does not devote more than 40 percent of total hours of work in the work week to activities that are not directly and closely related to the performance of the work described in paragraphs (1) through (4) of this definition. This paragraph (5) does not apply in the case of an employee who is in sole charge of an establishment or a physically separated branch establishment, or who owns at least a 20 percent interest in the enterprise in which the individual is employed.

Other eligible veteran means any other veteran who served on active duty during a war or in a campaign or expedition for which a campaign badge has been authorized.

Positions that will be filled from within the Contractor's organization means employment openings for which the Contractor will give no consideration to persons outside the Contractor's organization (including any affiliates, subsidiaries, and parent companies) and includes any openings the Contractor proposes to fill from regularly established “recall” lists. The exception does not apply to a particular opening once an employer decides to consider applicants outside of its organization.

Qualified special disabled veteran means a special disabled veteran who satisfies the requisite skill, experience, education, and other job-related requirements of the employment position such veteran holds or desires, and who, with or without reasonable accommodation, can perform the essential functions of such position.

Special disabled veteran means--

(1) A veteran who is entitled to compensation (or who but for the receipt of military retired pay would be entitled to compensation) under laws administered by the Department of Veterans Affairs for a disability--

(i) Rated at 30 percent or more; or

(ii) Rated at 10 or 20 percent in the case of a veteran who has been determined under 38 U.S.C. 3106 to have a serious employment handicap (i.e., a significant impairment of the veteran's ability to prepare for, obtain, or retain employment consistent with the veteran's abilities, aptitudes, and interests); or

(2) A person who was discharged or released from active duty because of a service-connected disability.

Veteran of the Vietnam era means a person who--

(1) Served on active duty for a period of more than 180 days and was discharged or released from active duty with other than a dishonorable discharge, if any part of such active duty occurred--

(i) In the Republic of Vietnam between February 28, 1961, and May 7, 1975; or

(ii) Between August 5, 1964, and May 7, 1975, in all other cases; or

(2) Was discharged or released from active duty for a service-connected disability if any part of the active duty was performed--

(i) In the Republic of Vietnam between February 28, 1961, and May 7, 1975; or

(ii) Between August 5, 1964, and May 7, 1975, in all other cases.
(b) General. (1) The Contractor shall not discriminate against the individual because the individual is a special disabled veteran, a veteran of the Vietnam era, or other eligible veteran, regarding any position for which the employee or applicant for employment is qualified. The Contractor shall take affirmative action to employ, advance in employment, and otherwise treat qualified special disabled veterans, veterans of the Vietnam era, and other eligible veterans without discrimination based upon their disability or veterans' status in all employment practices such as--

(i) Recruitment, advertising, and job application procedures;

(ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff and rehiring;

(iii) Rate of pay or any other form of compensation and changes in compensation;

(iv) Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists;

(v) Leaves of absence, sick leave, or any other leave;

(vi) Fringe benefits available by virtue of employment, whether or not administered by the Contractor;

(vii) Selection and financial support for training, including apprenticeship, and on-the-job training under 38 U.S.C. 3687, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;

(viii) Activities sponsored by the Contractor including social or recreational programs; and

(ix) Any other term, condition, or privilege of employment.

(2) The Contractor shall comply with the rules, regulations, and relevant orders of the Secretary of Labor issued under the Vietnam Era Veterans' Readjustment Assistance Act of 1972 (the Act), as amended (38 U.S.C. 4211 and 4212).

(c) Listing openings. (1) The Contractor shall immediately list all employment openings that exist at the time of the execution of this contract and those which occur during the performance of this contract, including those not generated by this contract, and including those occurring at an establishment of the Contractor other than the one where the contract is being performed, but excluding those of independently operated corporate affiliates, at an appropriate local public employment service office of the State wherein the opening occurs. Listing employment openings with the U.S. Department of Labor's America's Job Bank shall satisfy the requirement to list jobs with the local employment service office.

(2) The Contractor shall make the listing of employment openings with the local employment service office at least concurrently with using any other recruitment source or effort and shall involve the normal obligations of placing a bona fide job order, including accepting referrals of veterans and nonveterans. This listing of employment openings does not require hiring any particular job applicant or hiring from any particular group of job applicants and is not intended to relieve the Contractor from any requirements of Executive orders or regulations concerning nondiscrimination in employment.

(3) Whenever the Contractor becomes contractually bound to the listing terms of this clause, it shall advise the State public employment agency in each State where it has establishments of the name and location of each hiring location in the State. As long as the Contractor is contractually bound to these terms and has so advised the State agency, it need not advise the State agency of subsequent contracts. The Contractor may advise the State agency when it is no longer bound by this contract clause.

(d) Applicability. This clause does not apply to the listing of employment openings that occur and are filled outside the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, American Samoa, Guam, the Virgin Islands of the United States, and Wake Island.

(e) Postings. (1) The Contractor shall post employment notices in conspicuous places that are available to employees and applicants for employment.

(2) The employment notices shall--

(i) State the rights of applicants and employees as well as the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified employees and applicants who are special disabled veterans, veterans of the Vietnam era, and other eligible veterans; and

(ii) Be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance Programs, Department of Labor (Deputy Assistant Secretary of Labor), and provided by or through the Contracting Officer.

(3) The Contractor shall ensure that applicants or employees who are special disabled veterans are informed of the contents of the notice (e.g., the Contractor may have the notice read to a visually disabled veteran, or may lower the posted notice so that it can be read by a person in a wheelchair).

(4) The Contractor shall notify each labor union or representative of workers with which it has a collective bargaining agreement, or other contract understanding, that the Contractor is bound by the terms of the Act and is committed to take affirmative action to employ, and advance in employment, qualified special disabled veterans, veterans of the Vietnam era, and other eligible veterans.

(f) Noncompliance. If the Contractor does not comply with the requirements of this clause, the Government may take appropriate actions under the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.

(g) Subcontracts. The Contractor shall insert the terms of this clause in all subcontracts or purchase orders of $25,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor. The Contractor shall act as specified by the Deputy Assistant Secretary of Labor to enforce the terms, including action for noncompliance.

(End of clause)

52.222-36 AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)

(a) General. (1) Regarding any position for which the employee or applicant for employment is qualified, the Contractor shall not discriminate against any employee or applicant because of physical or mental disability. The Contractor agrees to take affirmative action to employ, advance in employment, and otherwise treat qualified individuals with disabilities without discrimination based upon their physical or mental disability in all employment practices such as--

(i) Recruitment, advertising, and job application procedures;

(ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff, and rehiring;

(iii) Rates of pay or any other form of compensation and changes in compensation;

(iv) Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists;

(v) Leaves of absence, sick leave, or any other leave;

(vi) Fringe benefits available by virtue of employment, whether or not administered by the Contractor;

(vii) Selection and financial support for training, including apprenticeships, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;

(viii) Activities sponsored by the Contractor, including social or recreational programs; and

(ix) Any other term, condition, or privilege of employment.

(2) The Contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor (Secretary) issued under the Rehabilitation Act of 1973 (29 U.S.C. 793) (the Act), as amended.

(b) Postings. (1) The Contractor agrees to post employment notices stating--

(i) The Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified individuals with disabilities; and

(ii) The rights of applicants and employees.

(2) These notices shall be posted in conspicuous places that are available to employees and applicants for employment. The Contractor shall ensure that applicants and employees with disabilities are informed of the contents of the notice (e.g., the Contractor may have the notice read to a visually disabled individual, or may lower the posted notice so that it might be read by a person in a wheelchair). The notices shall be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance of the U.S. Department of Labor (Deputy Assistant Secretary) and shall be provided by or through the Contracting Officer.

(3) The Contractor shall notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of Section 503 of the Act and is committed to take affirmative action to employ, and advance in employment, qualified individuals with physical or mental disabilities.

(c) Noncompliance. If the Contractor does not comply with the requirements of this clause, appropriate actions may be taken under the rules, regulations, and relevant orders of the Secretary issued pursuant to the Act.

(d) Subcontracts. The Contractor shall include the terms of this clause in every subcontract or purchase order in excess of $10,000 unless exempted by rules, regulations, or orders of the Secretary. The Contractor shall act as specified by the Deputy Assistant Secretary to enforce the terms, including action for noncompliance.

(End of clause)

52.222-37 EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)

(a) Unless the Contractor is a State or local government agency, the Contractor shall report at least annually, as required by the Secretary of Labor, on--

(1) The number of disabled veterans and the number of veterans of the Vietnam era in the workforce of the contractor by job category and hiring location; and

(2) The total number of new employees hired during the period covered by the report, and of that total, the number of disabled veterans, and the number of veterans of the Vietnam era.

(b) The above items shall be reported by completing the form entitled "Federal Contractor Veterans' Employment Report VETS-100."

(c) Reports shall be submitted no later than September 30 of each year beginning September 30, 1988.

(d) The employment activity report required by paragraph (a)(2) of this clause shall reflect total hires during the most recent 12-month period as of the ending date selected for the employment profile report required by paragraph (a)(1) of this clause. Contractors may select an ending date: (1) As of the end of any pay period during the period January

through March 1st of the year the report is due, or (2) as of December 31, if the contractor has previous written approval from the Equal Employment Opportunity Commission to do so for purposes of submitting the Employer Information Report EEO-1 (Standard Form 100).

(e) The count of veterans reported according to paragraph (a) of this clause shall be based on voluntary disclosure. Each Contractor subject to the reporting requirements at 38 U.S.C. 4212 shall invite all disabled veterans and veterans of the Vietnam era who wish to benefit under the affirmative action program at 38 U.S.C. 4212 to identify themselves to the Contractor. The invitation shall state that the information is voluntarily provided; that the information will be kept confidential; that disclosure or refusal to provide the information will not subject the applicant or employee to any adverse treatment; and that the information will be used only in accordance with the regulations promulgated under 38 U.S.C. 4212.

(f) Subcontracts. The Contractor shall include the terms of this clause in every subcontract or purchase order of $10,000 or more unless exempted by rules, regulations, or orders of the Secretary.

(End of clause)

52.223-3 HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(End of clause)

52.223-5 POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (AUG 2003)

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

Priority chemical means a chemical identified by the Interagency Environmental Leadership Workgroup or, alternatively, by an agency pursuant to section 503 of Executive Order 13148 of April 21, 2000, Greening the Government through Leadership in Environmental Management.

“Toxic chemical means a chemical or chemical category listed in 40 CFR 372.65.”

(b) Executive Order 13148 requires Federal facilities to comply with the provisions of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11001-11050) and the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13101-13109).

(c) The Contractor shall provide all information needed by the Federal facility to comply with the following:

(1) The emergency planning reporting requirements of section 302 of EPCRA.

(2) The emergency notice requirements of section 304 of EPCRA.

(3) The list of Material Safety Data Sheets, required by section 311 of EPCRA.

(4) The emergency and hazardous chemical inventory forms of section 312 of EPCRA.

(5) The toxic chemical release inventory of section 313 of EPCRA, which includes the reduction and recycling information required by section 6607 of PPA.

(6) The toxic chemical, priority chemical, and hazardous substance release and use reduction goals of sections 502 and 503 of Executive Order 13148.

(End of clause)

52.223-6 DRUG-FREE WORKPLACE (MAY 2001)

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

"Controlled substance" means a controlled substance in schedules I through V of section 202 of the Controlled Substances Act (21 U.S.C. 812) and as further defined in regulation at 21 CFR 1308.11 - 1308.15.

"Conviction" means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to deter- mine violations of the Federal or State criminal drug statutes.

"Criminal drug statute" means a Federal or non-Federal criminal statute involving the manufacture, distribution, dispensing, possession, or use of any controlled substance.

"Drug-free workplace" means the site(s) for the performance of work done by the Contractor in connection with a specific contract at which employees of the Contractor are prohibited from engaging in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance.

"Employee" means an employee of a Contractor directly engaged in the performance of work under a Government contract. "Directly engaged" is defined to include all direct cost employees and any other Contractor employee who has other than a minimal impact or involvement in contract performance.

"Individual" means an offeror/contractor that has no more than one employee including the offeror/contractor.

(b) The Contractor, if other than an individual, shall-- within 30 days after award (unless a longer period is agreed to in writing for contracts of 30 days or more performance duration), or as soon as possible for contracts of less than 30 days performance duration--

(1) Publish a statement notifying its employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition;

(2) Establish an ongoing drug-free awareness program to inform such employees about--

(i) The dangers of drug abuse in the workplace;

(ii) The Contractor's policy of maintaining a drug-free workplace;

(iii) Any available drug counseling, rehabilitation, and employee assistance programs; and

(iv) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

(3) Provide all employees engaged in performance of the contract with a copy of the statement required by subparagraph (b)(1) of this clause;

(4) Notify such employees in writing in the statement required by subparagraph (b)(1) of this clause that, as a condition of continued employment on this contract, the employee will--

(i) Abide by the terms of the statement; and

(ii) Notify the employer in writing of the employee's conviction under a criminal drug statute for a violation occurring in the workplace no later than 5 days after such conviction.

(5) Notify the Contracting Officer in writing within 10 days after receiving notice under subdivision (b)(4)(ii) of this clause, from an employee or otherwise receiving actual notice of such conviction. The notice shall include the position title of the employee;

(6) Within 30 days after receiving notice under subdivision (b)(4)(ii) of this clause of a conviction, take one of the following actions with respect to any employee who is convicted of a drug abuse violation occurring in the workplace:

(i) Taking appropriate personnel action against such employee, up to and including termination; or

(ii) Require such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency; and

(7) Make a good faith effort to maintain a drug-free workplace through implementation of subparagraphs (b)(1) though (b)(6) of this clause.

(c) The Contractor, if an individual, agrees by award of the contract or acceptance of a purchase order, not to engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance while performing this contract.

(d) In addition to other remedies available to the Government, the Contractor's failure to comply with the requirements of paragraph (b) or (c) of this clause may, pursuant to FAR 23.506, render the Contractor subject to suspension of contract payments, termination of the contract for default, and suspension or debarment.

(End of clause)

52.223-14 TOXIC CHEMICAL RELEASE REPORTING (AUG 2003)

(a) Unless otherwise exempt, the Contractor, as owner or operator of a facility used in the performance of this contract, shall file by July 1 for the prior calendar year an annual Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023(a) and (g)), and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106). The Contractor shall file, for each facility subject to the Form R filing and reporting requirements, the annual Form R throughout the life of the contract.

(b) A Contractor-owned or -operated facility used in the performance of this contract is exempt from the requirement to file an annual Form R if--

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

(2) The facility does not have 10 or more full-time employees as specified in section 313(b)(1)(A) of EPCRA, 42 U.S.C. 11023(b)(1)(A);

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

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

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

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

(iii) Major group codes 20 through 39.

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

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

(5) The facility is not located in the United States or its outlying areas.

(c) If the Contractor has certified to an exemption in accordance with one or more of the criteria in paragraph (b) of this clause, and after award of the contract circumstances change so that any of its owned or operated facilities used in the performance of this contract is no longer exempt--

(1) The Contractor shall notify the Contracting Officer; and

(2) The Contractor, as owner or operator of a facility used in the performance of this contract that is no longer exempt, shall (i) submit a Toxic Chemical Release Inventory Form (Form R) on or before July 1 for the prior calendar year during which the facility becomes eligible; and (ii) continue to file the annual Form R for the life of the contract for such facility.

(d) The Contracting Officer may terminate this contract or take other action as appropriate, if the Contractor fails to comply accurately and fully with the EPCRA and PPA toxic chemical release filing and reporting requirements.

(e) Except for acquisitions of commercial items, as defined in FAR Part 2, the Contractor shall--

(1) For competitive subcontracts expected to exceed $100,000 (including all options), include a solicitation provision substantially the same as the provision at FAR 52.223-13, Certification of Toxic Chemical Release Reporting; and

(2) Include in any resultant subcontract exceeding $100,000 (including all options), the substance of this clause, except this paragraph (e).

(End of clause)

52.225-11 BUY AMERICAN ACT--CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (JAN 2004)

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

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

Construction material means an article, material, or supply brought to the construction site by the Contractor or subcontractor for incorporation into the building or work. The term also includes an item brought to the site

preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

Cost of components means--

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

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.

Designated country means any of the following countries: Aruba, Austria, Bangladesh, Belgium, Benin, Bhutan, Botswana, Burkina Faso, Burundi, Canada, Cape Verde, Central African Republic, Chad, Comoros, Denmark.

Djibouti, Equatorial Guinea, Finland, France, Gambia, Germany, Greece, Guinea, Guinea-Bissau, Haiti, Hong Kong, Ireland, Israel, Italy, Japan.

Kiribati, Korea, Republic of, Lesotho, Liechtenstein, Luxembourg, Malawi, Maldives, Mali, Mozambique, Nepal, Netherlands, Niger, Norway, Portugal, Rwanda.

Sao Tome and Principe, Sierra Leone, Singapore, Somalia, Spain, Sweden, Switzerland, Tanzania U.R., Togo, Tuvalu, Uganda, United Kingdom, Vanuatu, Western Samoa, Yemen.

Designated country construction material means a construction material that--

(1) Is wholly the growth, product, or manufacture of a designated country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a designated country into a new and different construction material distinct from the materials from which it was transformed.

Domestic construction material means--

(1) An unmanufactured construction material mined or produced in the United States; or

(2) A construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic.

Foreign construction material means a construction material other than a domestic construction material.

Free Trade Agreement country means Canada, Chile, Mexico, or Singapore.

Free Trade Agreement country construction material means a construction material that--

(1) Is wholly the growth, product, or manufacture of a Free Trade Agreement (FTA) country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a FTA country into a new and different construction material distinct from the materials from which it was transformed.

United States means the 50 States, the District of Columbia, and outlying areas.

(b) Construction materials. (1) This clause implements the Buy American Act (41 U.S.C. 10a-10d) by providing a preference for domestic construction material. In addition, the Contracting Officer has determined that the Trade Agreements Act and Free Trade Agreements (FTAs) apply to this acquisition. Therefore, the Buy American Act restrictions are waived for designated country and FTA country construction materials.

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

(3) The requirement in paragraph (b)(2) of this clause does not apply to the construction materials or components listed by the Government as follows: NONE

(4) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(3) of this clause if the Government determines that--

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the restrictions of the Buy American Act is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent;

(ii) The application of the restriction of the Buy American Act to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) Request for determination of inapplicability of the Buy American Act.

(1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(4) of this clause shall include adequate information for Government evaluation of the request, including--

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

(D) Price;

(E) Time of delivery or availability;

(F) Location of the construction project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.

(iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).

(iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to the Buy American Act applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(4)(i) of this clause.

(3) Unless the Government determines that an exception to the Buy American Act applies, use of foreign construction material is noncompliant with the Buy American Act.

(d) Data. To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

Foreign and Domestic Construction Materials Price Comparison

Construction material description	Unit of measure	Quantity	Price (dollars) \1\
Item 1:			
Foreign construction material....	.....	.....	.....
Domestic construction material...	.....	.....	.....
Item 2:			
Foreign construction material....	.....	.....	.....
Domestic construction material...	.....	.....	.....

\1\ Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued).

List name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.

Include other applicable supporting information.

(e) United States law will apply to resolve any claim of breach of this contract.

(End of clause)

52.225-12 NOTICE OF BUY AMERICAN ACT REQUIREMENT-- CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (JAN 2004)

(a) Definitions. Construction material, designated country construction material, domestic construction material, foreign construction material, and FTA country construction material, as used in this provision, are defined in the

clause of this solicitation entitled “Buy American Act --Construction Materials under Trade Agreements” (Federal Acquisition Regulation (FAR) clause 52.225-11).

(b) Requests for determination of inapplicability. An offeror requesting a determination regarding the inapplicability of the Buy American Act should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of FAR clause 52.225-11 in the request. If an offeror has not requested a determination regarding the inapplicability of the Buy American Act before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) Evaluation of offers. (1) The Government will evaluate an offer requesting exception to the requirements of the Buy American Act, based on claimed unreasonable cost of domestic construction materials, by adding to the offered price the appropriate percentage of the cost of such foreign construction material, as specified in paragraph (b)(4)(i) of FAR clause 52.225-11.

(2) If evaluation results in a tie between an offeror that requested the substitution of foreign construction material based on unreasonable cost and an offeror that did not request an exception, the Contracting Officer will award to the offeror that did not request an exception based on unreasonable cost.

(d) Alternate offers. (1) When an offer includes foreign construction material, other than designated country or FTA country construction material, that is not listed by the Government in this solicitation in paragraph (b)(3) of FAR clause 52.225-11, the offeror also may submit an alternate offer based on use of equivalent domestic, designated country, or FTA country construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of FAR clause 52.225-11 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of FAR clause 52.225-11 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic, designated country, or FTA country construction material, and the offeror shall be required to furnish such domestic, designated country, or FTA country construction material. An offer based on use of the foreign construction material for which an exception was requested--

(i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or

(ii) May be accepted if revised during negotiations.

(End of provision)

52.225-13 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (JAN 2004)

(a) Except as authorized by the Office of Foreign Assets Control (OFAC) in the Department of the Treasury, the Contractor shall not acquire, for use in the performance of this contract, any supplies or services if any proclamation, Executive order, or statute administered by OFAC, or if OFAC's implementing regulations at 31 CFR chapter V, would prohibit such a transaction by a person subject to the jurisdiction of the United States.

(b) Except as authorized by OFAC, most transactions involving Cuba, Iran, Libya, and Sudan are prohibited, as are most imports from North Korea, into the United States or its outlying areas. Lists of entities and individuals subject

to economic sanctions are included in OFAC's List of Specially Designated Nationals and Blocked Persons at TerList1.html. More information about these restrictions, as well as updates, is available in the OFAC's regulations at 31 CFR chapter V and/or on OFAC's Web site at http://www.treas.gov/ofac.

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

(End of clause)

52.227-1 AUTHORIZATION AND CONSENT (JUL 1995)

(a) The Government authorizes and consents to all use and manufacture, in performing this contract or any subcontract at any tier, of any invention described in and covered by a United States patent (1) embodied in the structure or composition of any article the delivery of which is accepted by the Government under this contract or (2) used in machinery, tools, or methods whose use necessarily results from compliance by the Contractor or a subcontractor with (i) specifications or written provisions forming a part of this contract or (ii) specific written instructions given by the Contracting Officer directing the manner of performance. The entire liability to the Government for infringement of a patent of the United States shall be determined solely by the provisions of the indemnity clause, if any, included in this contract or any subcontract hereunder (including any lower-tier subcontract), and the Government assumes liability for all other infringement to the extent of the authorization and consent hereinabove granted.

(b) The Contractor agrees to include, and require inclusion of, this clause, suitably modified to identify the parties, in all subcontracts at any tier for supplies or services (including construction, architect-engineer services, and materials, supplies, models, samples, and design or testing services expected to exceed the simplified acquisition threshold (however, omission of this clause from any subcontract, including those at or below the simplified acquisition threshold, does not affect this authorization and consent.)

(End of clause)

52.227-2 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG 1996)

(a) The Contractor shall report to the Contracting Officer, promptly and in reasonable written detail, each notice or claim of patent or copyright infringement based on the performance of this contract of which the Contractor has knowledge.

(b) In the event of any claim or suit against the Government on account of any alleged patent or copyright infringement arising out of the performance of this contract or out of the use of any supplies furnished or work or services performed under this contract, the Contractor shall furnish to the Government, when requested by the Contracting Officer, all evidence and information in possession of the Contractor pertaining to such suit or claim. Such evidence and information shall be furnished at the expense of the Government except where the Contractor has agreed to indemnify the Government.

(4) The Contractor agrees to include, and require inclusion of, this clause in all subcontracts at any tier for supplies or services (including construction and architect-engineer subcontracts and those for material, supplies, models, samples, or design or testing services) expected to exceed the simplified acquisition threshold at (FAR) 2.101.to exceed the dollar amount set forth in 13.000 of the Federal Acquisition Regulation (FAR).

(End of clause)

52.227-4 PATENT INDEMNITY--CONSTRUCTION CONTRACTS (APR 1984)

Except as otherwise provided, the Contractor agrees to indemnify the Government and its officers, agents, and employees against liability, including costs and expenses, for infringement upon any United States patent (except a patent issued upon an application that is now or may hereafter be withheld from issue pursuant to a Secrecy Order under 35 U.S.C. 181) arising out of performing this contract or out of the use or disposal by or for the account of the Government of supplies furnished or work performed under this contract.

(End of clause)

52.228-1 BID GUARANTEE (SEP 1996)

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

(b) The bidder shall furnish a bid guarantee in the form of a firm commitment, e.g., bid bond supported by good and sufficient surety or sureties acceptable to the Government, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States. The Contracting Officer will return bid guarantees, other than bid bonds, (1) to unsuccessful bidders as soon as practicable after the opening of bids, and (2) to the successful bidder upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the bid as accepted.-

(c) The amount of the bid guarantee shall be _20_ percent of the bid price or $3,000,000, whichever is less.-

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

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

(End of clause)

52.228-2 ADDITIONAL BOND SECURITY (OCT 1997)

The Contractor shall promptly furnish additional security required to protect the Government and persons supplying labor or materials under this contract if--

(a) Any surety upon any bond, or issuing financial institution for other security, furnished with this contract becomes unacceptable to the Government.

(b) Any surety fails to furnish reports on its financial condition as required by the Government;

(c) The contract price is increased so that the penal sum of any bond becomes inadequate in the opinion of the Contracting Officer; or

(d) An irrevocable letter of credit (ILC) used as security will expire before the end of the period of required security. If the Contractor does not furnish an acceptable extension or replacement ILC, or other acceptable substitute, at least 30 days before an ILC's scheduled expiration, the Contracting officer has the right to immediately draw on the ILC.

(End of clause)

52.228-5 INSURANCE--WORK ON A GOVERNMENT INSTALLATION (JAN 1997)

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

(b) Before commencing work under this contract, the Contractor shall notify the Contracting Officer in writing that the required insurance has been obtained. The policies evidencing required insurance shall contain an endorsement to the effect that any cancellation or any material change adversely affecting the Government's interest shall not be effective (1) for such period as the laws of the State in which this contract is to be performed prescribe, or (2) until 30 days after the insurer or the Contractor gives written notice to the Contracting Officer, whichever period is longer.

(c) The Contractor shall insert the substance of this clause, including this paragraph (c), in subcontracts under this contract that require work on a Government installation and shall require subcontractors to provide and maintain the insurance required in the Schedule or elsewhere in the contract. The Contractor shall maintain a copy of all subcontractors' proofs of required insurance, and shall make copies available to the Contracting Officer upon request.

(End of clause)

52.228-11 PLEDGES OF ASSETS (FEB 1992)

(a) Offerors shall obtain from each person acting as an individual surety on a bid guarantee, a performance bond, or a payment bond--

(1) Pledge of assets; and

(2) Standard Form 28, Affidavit of Individual Surety.

(b) Pledges of assets from each person acting as an individual surety shall be in the form of--

(1) Evidence of an escrow account containing cash, certificates of deposit, commercial or Government securities, or other assets described in FAR 28.203-2 (except see 28.203-2(b)(2) with respect to Government securities held in book entry form) and/or;

(2) A recorded lien on real estate. The offeror will be required to provide--

(i) Evidence of title in the form of a certificate of title prepared by a title insurance company approved by the United States Department of Justice. This title evidence must show fee simple title vested in the surety along with any concurrent owners; whether any real estate taxes are due and payable; and any recorded encumbrances against the property, including the lien filed in favor of the Government as required by FAR 28.203-3(d);

(ii) Evidence of the amount due under any encumbrance shown in the evidence of title;

(iii) A copy of the current real estate tax assessment of the property or a current appraisal dated no earlier than 6 months prior to the date of the bond, prepared by a professional appraiser who certifies that the appraisal has been conducted in accordance with the generally accepted appraisal standards as reflected in the Uniform Standards of Professional Appraisal Practice, as promulgated by the Appraisal Foundation.

(End of clause)

52.228-12 PROSPECTIVE SUBCONTRACTOR REQUESTS FOR BONDS. (OCT 1995)

In accordance with Section 806(a)(3) of Pub. L. 102-190, as amended by Sections 2091 and 8105 of Pub. L. 103-355, upon the request of a prospective subcontractor or supplier offering to furnish labor or material for the performance of this contract for which a payment bond has been furnished to the Government pursuant to the Miller Act, the Contractor shall promptly provide a copy of such payment bond to the requester.

(End of clause)

52.228-14 IRREVOCABLE LETTER OF CREDIT (DEC 1999)

(a) “Irrevocable letter of credit” (ILC), as used in this clause, means a written commitment by a federally insured financial institution to pay all or part of a stated amount of money, until the expiration date of the letter, upon presentation by the Government (the beneficiary) of a written demand therefor. Neither the financial institution nor the offeror/Contractor can revoke or condition the letter of credit.

(b) If the offeror intends to use an ILC in lieu of a bid bond, or to secure other types of bonds such as performance and payment bonds, the letter of credit and letter of confirmation formats in paragraphs (e) and (f) of this clause shall be used.

(c) The letter of credit shall be irrevocable, shall require presentation of no document other than a written demand and the ILC (including confirming letter, if any), shall be issued/confirmed by an acceptable federally insured financial institution as provided in paragraph (d) of this clause, and--

(1) If used as a bid guarantee, the ILC shall expire no earlier than 60 days after the close of the bid acceptance period;

(2) If used as an alternative to corporate or individual sureties as security for a performance or payment bond, the offeror/Contractor may submit an ILC with an initial expiration date estimated to cover the entire period for which financial security is required or may submit an ILC with an initial expiration date that is a minimum period of one year from the date of issuance. The ILC shall provide that, unless the issuer provides the beneficiary written notice of non-renewal at least 60 days in advance of the current expiration date, the ILC is automatically extended without amendment for one year from the expiration date, or any future expiration date, until the period of required coverage is completed and the Contracting Officer provides the financial institution with a written statement waiving the right to payment. The period of required coverage shall be:

(i) For contracts subject to the Miller Act, the later of--

(A) One year following the expected date of final payment;

(B) For performance bonds only, until completion of any warranty period; or

(C) For payment bonds only, until resolution of all claims filed against the payment bond during the one-year period following final payment.

(ii) For contracts not subject to the Miller Act, the later of--

(A) 90 days following final payment; or

(B) For performance bonds only, until completion of any warranty period.

(d) Only federally insured financial institutions rated investment grade or higher shall issue or confirm the ILC. The offeror/Contractor shall provide the Contracting Officer a credit rating that indicates the financial institution has the required rating(s) as of the date of issuance of the ILC. Unless the financial institution issuing the ILC had letter of credit business of less than $25 million in the past year, ILCs over $5 million must be confirmed by another acceptable financial institution that had letter of credit business of less than $25 million in the past year.

(e) The following format shall be used by the issuing financial institution to create an ILC:

_____

[Issuing Financial Institution's Letterhead or Name and Address]

Issue Date _____

IRREVOCABLE LETTER OF CREDIT NO. _____

Account party's name _____

Account party's address _____

For Solicitation No. _____(for reference only)

TO: [U.S. Government agency]

[U.S. Government agency's address]

1. We hereby establish this irrevocable and transferable Letter of Credit in your favor for one or more drawings up to United States $_____. This Letter of Credit is payable at [issuing financial institution's and, if any, confirming financial institution's] office at [issuing financial institution's address and, if any, confirming financial institution's address] and expires with our close of business on _____, or any automatically extended expiration date.

2. We hereby undertake to honor your or the transferee's sight draft(s) drawn on the issuing or, if any, the confirming financial institution, for all or any part of this credit if presented with this Letter of Credit and confirmation, if any, at the office specified in paragraph 1 of this Letter of Credit on or before the expiration date or any automatically extended expiration date.

3. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this Letter of Credit that it is deemed to be automatically extended without amendment for one year from the expiration date hereof, or any future expiration date, unless at least 60 days prior to any expiration date, we notify you or the transferee by registered mail, or other receipted means of delivery, that we elect not to consider this Letter of Credit renewed for any such additional period. At the time we notify you, we also agree to notify the account party (and confirming financial institution, if any) by the same means of delivery.

4. This Letter of Credit is transferable. Transfers and assignments of proceeds are to be effected without charge to either the beneficiary or the transferee/assignee of proceeds. Such transfer or assignment shall be only at the written direction of the Government (the beneficiary) in a form satisfactory to the issuing financial institution and the

confirming financial institution, if any.

5. This Letter of Credit is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. 500, and to the extent not inconsistent therewith, to the laws of _____ [state of confirming financial institution, if any, otherwise state of issuing financial institution].

6. If this credit expires during an interruption of business of this financial institution as described in Article 17 of the UCP, the financial institution specifically agrees to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

_____

[Issuing financial institution]

(f) The following format shall be used by the financial institution to confirm an ILC:

_____
[Confirming Financial Institution's Letterhead or Name and Address]

(Date) _____

Our Letter of Credit Advice Number _____

Beneficiary: _____ [U.S. Government agency]

Issuing Financial Institution: _____

Issuing Financial Institution's LC No.: _____

Gentlemen:

1. We hereby confirm the above indicated Letter of Credit, the original of which is attached, issued by _____ [name of issuing financial institution] for drawings of up to United States dollars _____/U.S. $_____ and expiring with our close of business on _____ [the expiration date], or any automatically extended expiration date.

2. Draft(s) drawn under the Letter of Credit and this Confirmation are payable at our office located at _____.

3. We hereby undertake to honor sight draft(s) drawn under and presented with the Letter of Credit and this Confirmation at our offices as specified herein.

4. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this confirmation that it be deemed automatically extended without amendment for one year from the expiration date hereof, or any automatically extended expiration date, unless:

(a) At least 60 days prior to any such expiration date, we shall notify the Contracting Officer, or the transferee and the issuing financial institution, by registered mail or other receipted means of delivery, that we elect not to consider this confirmation extended for any such additional period; or

(b) The issuing financial institution shall have exercised its right to notify you or the transferee, the account party, and ourselves, of its election not to extend the expiration date of the Letter of Credit.

5. This confirmation is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. 500, and to the extent not inconsistent therewith, to the laws of _____ [state of confirming financial institution].

6. If this confirmation expires during an interruption of business of this financial institution as described in Article 17 of the UCP, we specifically agree to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

_____

[Confirming financial institution]

(g) The following format shall be used by the Contracting Officer for a sight draft to draw on the Letter of Credit:

SIGHT DRAFT

_____

[City, State]

(Date) _____

[Name and address of financial institution]

Pay to the order of _____ [Beneficiary Agency] _____ the sum of United States $_____. This draft is drawn under Irrevocable Letter of Credit No. _____.

_____

[Beneficiary Agency]

By: _____

(End of clause)

52.228-15 PERFORMANCE AND PAYMENT BONDS--CONSTRUCTION (JUL 2000)-

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

Original contract price means the award price of the contract; or, for requirements contracts, the price payable for the estimated total quantity; or, for indefinite-quantity contracts, the price payable for the specified minimum quantity. Original contract price does not include the price of any options, except those options exercised at the time of contract award.

(b) Amount of required bonds. Unless the resulting contract price is $100,000 or less, the successful offeror shall furnish performance and payment bonds to the Contracting Officer as follows:

(1) Performance bonds (Standard Form 25). The penal amount of performance bonds at the time of contract award shall be 100 percent of the original contract price.

(2) Payment Bonds (Standard Form 25-A). The penal amount of payment bonds at the time of contract award shall be 100 percent of the original contract price.

(3) Additional bond protection. (i) The Government may require additional performance and payment bond protection if the contract price is increased. The increase in protection generally will equal 100 percent of the increase in contract price.

(ii) The Government may secure the additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(c) Furnishing executed bonds. The Contractor shall furnish all executed bonds, including any necessary reinsurance agreements, to the Contracting Officer, within the time period specified in the Bid Guarantee provision of the solicitation, or otherwise specified by the Contracting Officer, but in any event, before starting work.

(d) Surety or other security for bonds. The bonds shall be in the form of firm commitment, supported by corporate sureties whose names appear on the list contained in Treasury Department Circular 570, individual sureties, or by other acceptable security such as postal money order, certified check, cashier's check, irrevocable letter of credit, or, in accordance with Treasury Department regulations, certain bonds or notes of the United States. Treasury Circular 570 is published in the Federal Register or may be obtained from the U.S. Department of Treasury, Financial Management Service, Surety Bond Branch, 401 14th Street, NW, 2nd Floor, West Wing, Washington, DC 20227.

(e) Notice of subcontractor waiver of protection (40 U.S.C. 270b(c). Any waiver of the right to sue on the payment bond is void unless it is in writing, signed by the person whose right is waived, and executed after such person has first furnished labor or material for use in the performance of the contract.

(End of clause)

52.229-3 FEDERAL, STATE, AND LOCAL TAXES (APR 2003)

(a) As used in this clause--

"Contract date" means the date set for bid opening or, if this is a negotiated contract or a modification, the effective date of this contract or modification.

"All applicable Federal, State, and local taxes and duties" means all taxes and duties, in effect on the contract date, that the taxing authority is imposing and collecting on the transactions or property covered by this contract.

"After-imposed Federal tax" means any new or increased Federal excise tax or duty, or tax that was exempted or excluded on the contract date but whose exemption was later revoked or reduced during the contract period, on the transactions or property covered by this contract that the Contractor is required to pay or bear as the result of legislative, judicial, or administrative action taking effect after the contract date. It does not include social security tax or other employment taxes.

"After-relieved Federal tax" means any amount of Federal excise tax or duty, except social security or other employment taxes, that would otherwise have been payable on the transactions or property covered by this contract, but which the Contractor is not required to pay or bear, or for which the Contractor obtains a refund or drawback, as the result of legislative, judicial, or administrative action taking effect after the contract date.

Local taxes includes taxes imposed by a possession or territory of the United States, Puerto Rico, or the Northern Mariana Islands, if the contract is performed wholly or partly in any of those areas.

(b) The contract price includes all applicable Federal, State, and local taxes and duties.

(c) The contract price shall be increased by the amount of any after-imposed Federal tax, provided the Contractor warrants in writing that no amount for such newly imposed Federal excise tax or duty or rate increase was included in the contract price, as a contingency reserve or otherwise.

(d) The contract price shall be decreased by the amount of any after-relieved Federal tax.

(e) The contract price shall be decreased by the amount of any Federal excise tax or duty, except social security or other employment taxes, that the Contractor is required to pay or bear, or does not obtain a refund of, through the Contractor's fault, negligence, or failure to follow instructions of the Contracting Officer.

(f) No adjustment shall be made in the contract price under this clause unless the amount of the adjustment exceeds $250.

(g) The Contractor shall promptly notify the Contracting Officer of all matters relating to any Federal excise tax or duty that reasonably may be expected to result in either an increase or decrease in the contract price and shall take appropriate action as the Contracting Officer directs.

(h) The Government shall, without liability, furnish evidence appropriate to establish exemption from any Federal, State, or local tax when the Contractor requests such evidence and a reasonable basis exists to sustain the exemption.

(End of clause)

52.231-5000 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE
MAR 1995)--EFARS

(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 IX. 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.

(End of clause)

52.232-5 PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (SEP 2002)

(a) Payment of price. The Government shall pay the Contractor the contract price as provided in this contract.

(b) Progress payments. The Government shall make progress payments monthly as the work proceeds, or at more frequent intervals as determined by the Contracting Officer, on estimates of work accomplished which meets the standards of quality established under the contract, as approved by the Contracting Officer.

(1) The Contractor's request for progress payments shall include the following substantiation:

(i) An itemization of the amounts requested, related to the various elements of work required by the contract covered by the payment requested.

(ii) A listing of the amount included for work performed by each subcontractor under the contract.

(iii) A listing of the total amount of each subcontract under the contract.

(iv) A listing of the amounts previously paid to each such subcontractor under the contract.

(v) Additional supporting data in a form and detail required by the Contracting Officer.

(2) In the preparation of estimates, the Contracting Officer may authorize material delivered on the site and preparatory work done to be taken into consideration. Material delivered to the Contractor at locations other than the site also may be taken into consideration if--

(i) Consideration is specifically authorized by this contract; and

(ii) The Contractor furnishes satisfactory evidence that it has acquired title to such material and that the material will be used to perform this contract.

(c) Contractor certification. Along with each request for progress payments, the Contractor shall furnish the following certification, or payment shall not be made: (However, if the Contractor elects to delete paragraph (c)(4) from the certification, the certification is still acceptable.)

I hereby certify, to the best of my knowledge and belief, that--

(1) The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;

(2) All payments due to subcontractors and suppliers from previous payments received under the contract have been made, and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract agreements and the requirements of chapter 39 of Title 31, United States Code;

(3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract; and

(4) This certification is not to be construed as final acceptance of a subcontractor's performance.

_____

(Name)

_____

(Title)

_____

(Date)

(d) Refund of unearned amounts. If the Contractor, after making a certified request for progress payments, discovers that a portion or all of such request constitutes a payment for performance by the Contractor that fails to conform to the specifications, terms, and conditions of this contract (hereinafter referred to as the "unearned amount"), the Contractor shall--

(1) Notify the Contracting Officer of such performance deficiency; and

(2) Be obligated to pay the Government an amount (computed by the Contracting Officer in the manner provided in paragraph (j) of this clause) equal to interest on the unearned amount from the 8th day after the date of receipt of the unearned amount until--

(i) The date the Contractor notifies the Contracting Officer that the performance deficiency has been corrected; or

(ii) The date the Contractor reduces the amount of any subsequent certified request for progress payments by an amount equal to the unearned amount.

(e) Retainage. If the Contracting Officer finds that satisfactory progress was achieved during any period for which a progress payment is to be made, the Contracting Officer shall authorize payment to be made in full. However, if satisfactory progress has not been made, the Contracting Officer may retain a maximum of 10 percent of the amount of the payment until satisfactory progress is achieved. When the work is substantially complete, the Contracting Officer may retain from previously withheld funds and future progress payments that amount the Contracting Officer considers adequate for protection of the Government and shall release to the Contractor all the remaining withheld funds. Also, on completion and acceptance of each separate building, public work, or other division of the contract, for which the price is stated separately in the contract, payment shall be made for the completed work without retention of a percentage.

(f) Title, liability, and reservation of rights. All material and work covered by progress payments made shall, at the time of payment, become the sole property of the Government, but this shall not be construed as--

(1) Relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work; or

(2) Waiving the right of the Government to require the fulfillment of all of the terms of the contract.

(g) Reimbursement for bond premiums. In making these progress payments, the Government shall, upon request, reimburse the Contractor for the amount of premiums paid for performance and payment bonds (including coinsurance and reinsurance agreements, when applicable) after the Contractor has furnished evidence of full payment to the surety. The retainage provisions in paragraph (e) of this clause shall not apply to that portion of progress payments attributable to bond premiums.

(h) Final payment. The Government shall pay the amount due the Contractor under this contract after--

(1) Completion and acceptance of all work;

(2) Presentation of a properly executed voucher; and

(3) Presentation of release of all claims against
the Government arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned under the Assignment of Claims Act of 1940 (31 U.S.C. 3727 and 41 U.S.C. 15).

(i) Limitation because of undefinitized work. Notwithstanding any provision of this contract, progress payments shall not exceed 80 percent on work accomplished on undefinitized contract actions. A "contract action" is any action resulting in a contract, as defined in FAR Subpart 2.1, including contract modifications for additional supplies or services, but not including contract modifications that are within the scope and under the terms of the contract, such as contract modifications issued pursuant to the Changes clause, or funding and other administrative changes.

(j) Interest computation on unearned amounts. In accordance with 31 U.S.C. 3903(c)(1), the amount payable under subparagraph (d)(2) of this clause shall be--

(1) Computed at the rate of average bond equivalent rates of 91-day Treasury bills auctioned at the most recent auction of such bills prior to the date the Contractor receives the unearned amount; and

(2) Deducted from the next available payment to the Contractor.

(End of clause)

52.232-17 INTEREST (JUNE 1996)

(a) Except as otherwise provided in this contract under a Price Reduction for Defective Cost or Pricing Data clause or a Cost Accounting Standards clause, all amounts that become payable by the Contractor to the Government under this contract (net of any applicable tax credit under the Internal Revenue Code (26 U.S.C. 1481)) shall bear simple interest from the date due until paid unless paid within 30 days of becoming due. The interest rate shall be the interest rate established by the Secretary of the Treasury as provided in Section 12 of the Contract Disputes Act of 1978 (Public Law 95-563), which is applicable to the period in which the amount becomes due, as provided in paragraph (b) of this clause, and then at the rate applicable for each six-month period as fixed by the Secretary until the amount is paid. reproduce, prepare derivative works, distribute copies to the public, and (b) Amounts shall be due at the earliest of the following dates:

(1) The date fixed under this contract.

(2) The date of the first written demand for payment consistent with this contract, including any demand resulting

from a default termination.

(3) The date the Government transmits to the Contractor a proposed supplemental agreement to confirm completed negotiations establishing the amount of debt.

(4) If this contract provides for revision of prices, the date of written notice to the Contractor stating the amount of refund payable in connection with a pricing proposal or a negotiated pricing agreement not confirmed by contract modification.

(c) The interest charge made under this clause may be reduced under the procedures prescribed in 32.614-2 of the Federal Acquisition Regulation in effect on the date of this contract.

(End of clause)

52.232-18 AVAILABILITY OF FUNDS (APR 1984)

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

(End of clause)

52.232-23 ASSIGNMENT OF CLAIMS (JAN 1986)

(a) The Contractor, under the Assignment of Claims Act, as amended, 31 U.S.C. 3727, 41 U.S.C. 15 (hereafter referred to as "the Act"), may assign its rights to be paid amounts due or to become due as a result of the performance of this contract to a bank, trust company, or other financing institution, including any Federal lending agency. The assignee under such an assignment may thereafter further assign or reassign its right under the original assignment to any type of financing institution described in the preceding sentence.

(b) Any assignment or reassignment authorized under the Act and this clause shall cover all unpaid amounts payable under this contract, and shall not be made to more than one party, except that an assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in the financing of this contract.

(c) The Contractor shall not furnish or disclose to any assignee under this contract any classified document (including this contract) or information related to work under this contract until the Contracting Officer authorizes such action in writing.

(End of clause)

52.232-27 PROMPT PAYMENT FOR CONSTRUCTION CONTRACTS (OCT 2003)

Notwithstanding any other payment terms in this contract, the Government will make invoice payments under the terms and conditions specified in this clause. The Government considers payment as being made on the day a check is dated or the date of an electronic funds transfer. Definitions of pertinent terms are set forth in sections 2.101,

32.001, and 32.902 of the Federal Acquisition Regulation. All days referred to in this clause are calendar days, unless otherwise specified. (However, see paragraph (a)(3) concerning payments due on Saturdays, Sundays, and legal holidays.)

(a) Invoice payments--(1) Types of invoice payments. For purposes of this clause, there are several types of invoice payments that may occur under this contract, as follows:

(i) Progress payments, if provided for elsewhere in this contract, based on Contracting Officer approval of the estimated amount and value of work or services performed, including payments for reaching milestones in any project.

(A) The due date for making such payments is 14 days after the designated billing office receives a proper payment request. If the designated billing office fails to annotate the payment request with the actual date of receipt at the time of receipt, the payment due date is the 14th day after the date of the Contractor's payment request, provided the designated billing office receives a proper payment request and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(B) The due date for payment of any amounts retained by the Contracting Officer in accordance with the clause at 52.232-5, Payments Under Fixed-Price Construction Contracts, is as specified in the contract or, if not specified, 30 days after approval by the Contracting Officer for release to the Contractor.

(ii) Final payments based on completion and acceptance of all work and presentation of release of all claims against the Government arising by virtue of the contract, and payments for partial deliveries that have been accepted by the Government (e.g., each separate building, public work, or other division of the contract for which the price is stated separately in the contract).

(A) The due date for making such payments is the later of the following two events:

(1) The 30th day after the designated billing office receives a proper invoice from the Contractor.

(2) The 30th day after Government acceptance of the work or services completed by the Contractor. For a final invoice when the payment amount is subject to contract settlement actions (e.g., release of claims), acceptance is deemed to occur on the effective date of the contract settlement.

(B) If the designated billing office fails to annotate the invoice with the date of actual receipt at the time of receipt, the invoice payment due date is the 30th day after the date of the Contractor's invoice, provided the designated billing office receives a proper invoice and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(2) Contractor's invoice. The Contractor shall prepare and submit invoices to the designated billing office specified in the contract. A proper invoice must include the items listed in paragraphs (a)(2)(i) through (a)(2)(xi) of this clause. If the invoice does not comply with these requirements, the designated billing office must return it within 7 days after receipt, with the reasons why it is not a proper invoice. When computing any interest penalty owed the Contractor, the Government will take into account if the Government notifies the Contractor of an improper invoice in an untimely manner.

(i) Name and address of the Contractor.

(ii) Invoice date and invoice number. (The Contractor should date invoices as close as possible to the date of mailing or transmission.)

(iii) Contract number or other authorization for work or services performed (including order number and contract line item number).

(iv) Description of work or services performed.

(v) Delivery and payment terms (e.g., discount for prompt payment terms).

(vi) Name and address of Contractor official to whom payment is to be sent (must be the same as that in the contract or in a proper notice of assignment).

(vii) Name (where practicable), title, phone number, and mailing address of person to notify in the event of a defective invoice.

(viii) For payments described in paragraph (a)(1)(i) of this clause, substantiation of the amounts requested and certification in accordance with the requirements of the clause at 52.232-5, Payments Under Fixed-Price Construction Contracts.

(ix) Taxpayer Identification Number (TIN). The Contractor shall include its TIN on the invoice only if required elsewhere in this contract.

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

(A) The Contractor shall include EFT banking information on the invoice only if required elsewhere in this contract.

(B) If EFT banking information is not required to be on the invoice, in order for the invoice to be a proper invoice, the Contractor shall have submitted correct EFT banking information in accordance with the applicable solicitation provision (e.g., 52.232-38, Submission of Electronic Funds Transfer Information with Offer), contract clause (e.g., 52.232-33, Payment by Electronic Funds Transfer--Central Contractor Registration, or 52.232-34, Payment by Electronic Funds Transfer--Other Than Central Contractor Registration), or applicable agency procedures.

(C) EFT banking information is not required if the Government waived the requirement to pay by EFT.

(xi) Any other information or documentation required by the contract.

(3) Interest penalty. The designated payment office will pay an interest penalty automatically, without request from the Contractor, if payment is not made by the due date and the conditions listed in paragraphs (a)(3)(i) through (a)(3)(iii) of this clause are met, if applicable. However, when the due date falls on a Saturday, Sunday, or legal holiday, the designated payment office may make payment on the following working day without incurring a late payment interest penalty.

(i) The designated billing office received a proper invoice.

(ii) The Government processed a receiving report or other Government documentation authorizing payment and there was no disagreement over quantity, quality, Contractor compliance with any contract term or condition, or requested progress payment amount.

(iii) In the case of a final invoice for any balance of funds due the Contractor for work or services performed, the amount was not subject to further contract settlement actions between the Government and the Contractor.

(4) Computing penalty amount. The Government will compute the interest penalty in accordance with the Office of Management and Budget prompt payment regulations at 5 CFR part 1315.

(i) For the sole purpose of computing an interest penalty that might be due the Contractor for payments described in paragraph (a)(1)(ii) of this clause, Government acceptance or approval is deemed to occur constructively on the 7th day after the Contractor has completed the work or services in accordance with the terms and conditions of the

contract. If actual acceptance or approval occurs within the constructive acceptance or approval period, the Government will base the determination of an interest penalty on the actual date of acceptance or approval. Constructive acceptance or constructive approval requirements do not apply if there is a disagreement over quantity, quality, or Contractor compliance with a contract provision. These requirements also do not compel Government officials to accept work or services, approve Contractor estimates, perform contract administration functions, or make payment prior to fulfilling their responsibilities.

(ii) The prompt payment regulations at 5 CFR 1315.10(c) do not require the Government to pay interest penalties if payment delays are due to disagreement between the Government and the Contractor over the payment amount or other issues involving contract compliance, or on amounts temporarily withheld or retained in accordance with the terms of the contract. The Government and the Contractor shall resolve claims involving disputes, and any interest that may be payable in accordance with the clause at FAR 52.233-1, Disputes.

(5) Discounts for prompt payment. The designated payment office will pay an interest penalty automatically, without request from the Contractor, if the Government takes a discount for prompt payment improperly. The Government will calculate the interest penalty in accordance with the prompt payment regulations at 5 CFR part 1315.

(6) Additional interest penalty. (i) The designated payment office will pay a penalty amount, calculated in accordance with the prompt payment regulations at 5 CFR part 1315 in addition to the interest penalty amount only if--

(A) The Government owes an interest penalty of $1 or more;

(B) The designated payment office does not pay the interest penalty within 10 days after the date the invoice amount is paid; and

(C) The Contractor makes a written demand to the designated payment office for additional penalty payment, in accordance with paragraph (a)(6)(ii) of this clause, postmarked not later than 40 days after the date the invoice amount is paid.

(ii)(A) The Contractor shall support written demands for additional penalty payments with the following data. The Government will not request any additional data. The Contractor shall--

(1) Specifically assert that late payment interest is due under a specific invoice, and request payment of all overdue late payment interest penalty and such additional penalty as may be required;

(2) Attach a copy of the invoice on which the unpaid late payment interest was due; and

(3) State that payment of the principal has been received, including the date of receipt.

(B) If there is no postmark or the postmark is illegible--

(1) The designated payment office that receives the demand will annotate it with the date of receipt provided the demand is received on or before the 40th day after payment was made; or

(2) If the designated payment office fails to make the required annotation, the Government will determine the demand's validity based on the date the Contractor has placed on the demand, provided such date is no later than the 40th day after payment was made.

(b) Contract financing payments. If this contract provides for contract financing, the Government will make contract financing payments in accordance with the applicable contract financing clause.

(c) Subcontract clause requirements. The Contractor shall include in each subcontract for property or services (including a material supplier) for the purpose of performing this contract the following:

(1) Prompt payment for subcontractors. A payment clause that obligates the Contractor to pay the subcontractor for satisfactory performance under its subcontract not later than 7 days from receipt of payment out of such amounts as are paid to the Contractor under this contract.

(2) Interest for subcontractors. An interest penalty clause that obligates the Contractor to pay to the subcontractor an interest penalty for each payment not made in accordance with the payment clause--

(i) For the period beginning on the day after the required payment date and ending on the date on which payment of the amount due is made; and

(ii) Computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty.

(3) Subcontractor clause flowdown. A clause requiring each subcontractor to use:

(i) Include a payment clause and an interest penalty clause conforming to the standards set forth in paragraphs (c)(1) and (c)(2) of this clause in each of its subcontracts; and

(ii) Require each of its subcontractors to include such clauses in their subcontracts with each lower-tier subcontractor or supplier.

(d) Subcontract clause interpretation. The clauses required by paragraph (c) of this clause shall not be construed to impair the right of the Contractor or a subcontractor at any tier to negotiate, and to include in their subcontract, provisions that--

(1) Retainage permitted. Permit the Contractor or a subcontractor to retain (without cause) a specified percentage of each progress payment otherwise due to a subcontractor for satisfactory performance under the subcontract without incurring any obligation to pay a late payment interest penalty, in accordance with terms and conditions agreed to by the parties to the subcontract, giving such recognition as the parties deem appropriate to the ability of a subcontractor to furnish a performance bond and a payment bond;

(2) Withholding permitted. Permit the Contractor or subcontractor to make a determination that part or all of the subcontractor's request for payment may be withheld in accordance with the subcontract agreement; and

(3) Withholding requirements. Permit such withholding without incurring any obligation to pay a late payment penalty if--

(i) A notice conforming to the standards of paragraph (g) of this clause previously has been furnished to the subcontractor; and

(ii) The Contractor furnishes to the Contracting Officer a copy of any notice issued by a Contractor pursuant to paragraph (d)(3)(i) of this clause.

(e) Subcontractor withholding procedures. If a Contractor, after making a request for payment to the Government but before making a payment to a subcontractor for the subcontractor's performance covered by the payment request, discovers that all or a portion of the payment otherwise due such subcontractor is subject to withholding from the subcontractor in accordance with the subcontract agreement, then the Contractor shall--

(1) Subcontractor notice. Furnish to the subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon ascertaining the cause giving rise to a withholding, but prior to the due date for subcontractor payment;

(2) Contracting Officer notice. Furnish to the Contracting Officer, as soon as practicable, a copy of the notice furnished to the subcontractor pursuant to paragraph (e)(1) of this clause;

(3) Subcontractor progress payment reduction. Reduce the subcontractor's progress payment by an amount not to exceed the amount specified in the notice of withholding furnished under paragraph (e)(1) of this clause;

(4) Subsequent subcontractor payment. Pay the subcontractor as soon as practicable after the correction of the identified subcontract performance deficiency, and--

(i) Make such payment within--

(A) Seven days after correction of the identified subcontract performance deficiency (unless the funds therefor must be recovered from the Government because of a reduction under paragraph
(e)(5)(i)) of this clause; or

(B) Seven days after the Contractor recovers such funds from the Government; or

(ii) Incur an obligation to pay a late payment interest penalty computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under section 12 of the Contracts Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty;

(5) Notice to Contracting Officer. Notify the Contracting Officer upon--

(i) Reduction of the amount of any subsequent certified application for payment; or

(ii) Payment to the subcontractor of any withheld amounts of a progress payment, specifying--

(A) The amounts withheld under paragraph (e)(1) of this clause; and

(B) The dates that such withholding began and ended; and

(6) Interest to Government. Be obligated to pay to the Government an amount equal to interest on the withheld payments (computed in the manner provided in 31 U.S.C. 3903(c)(1)), from the 8th day after receipt of the withheld amounts from the Government until--

(i) The day the identified subcontractor performance deficiency is corrected; or

(ii) The date that any subsequent payment is reduced under paragraph (e)(5)(i) of this clause.

(f) Third-party deficiency reports--(1) Withholding from subcontractor. If a Contractor, after making payment to a first-tier subcontractor, receives from a supplier or subcontractor of the first-tier subcontractor (hereafter referred to as a “second-tier subcontractor”) a written notice in accordance with section 2 of the Act of August 24, 1935 (40 U.S.C. 270b, Miller Act), asserting a deficiency in such first-tier subcontractor's performance under the contract for which the Contractor may be ultimately liable, and the Contractor determines that all or a portion of future payments otherwise due such first-tier subcontractor is subject to withholding in accordance with the subcontract agreement, the Contractor may, without incurring an obligation to pay an interest penalty under paragraph (e)(6) of this clause--

(i) Furnish to the first-tier subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon making such determination; and

(ii) Withhold from the first-tier subcontractor's next available progress payment or payments an amount not to exceed the amount specified in the notice of withholding furnished under paragraph (f)(1)(i) of this clause.

(2) Subsequent payment or interest charge. As soon as practicable, but not later than 7 days after receipt of satisfactory written notification that the identified subcontract performance deficiency has been corrected, the Contractor shall--

(i) Pay the amount withheld under paragraph (f)(1)(ii) of this clause to such first-tier subcontractor; or

(ii) Incur an obligation to pay a late payment interest penalty to such first-tier subcontractor computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under section 12 of the Contracts DisputesAct of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty.

(g) Written notice of subcontractor withholding. The Contractor shall issue a written notice of any withholding to a subcontractor (with a copy furnished to the Contracting Officer), specifying--

(1) The amount to be withheld;

(2) The specific causes for the withholding under the terms of the subcontract; and

(3) The remedial actions to be taken by the subcontractor in order to receive payment of the amounts withheld.

(h) Subcontractor payment entitlement. The Contractor may not request payment from the Government of any amount withheld or retained in accordance with paragraph (d) of this clause until such time as the Contractor has determined and certified to the Contracting Officer that the subcontractor is entitled to the payment of such amount.

(i) Prime-subcontractor disputes. A dispute between the Contractor and subcontractor relating to the amount or entitlement of a subcontractor to a payment or a late payment interest penalty under a clause included in the subcontract pursuant to paragraph (c) of this clause does not constitute a dispute to which the Government is a party. The Government may not be interpleaded in any judicial or administrative proceeding involving such a dispute.

(j) Preservation of prime-subcontractor rights. Except as provided in paragraph (i) of this clause, this clause shall not limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or a subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor or deficient subcontract performance or nonperformance by a subcontractor.

(k) Non-recourse for prime contractor interest penalty. The Contractor's obligation to pay an interest penalty to a subcontractor pursuant to the clauses included in a subcontract under paragraph (c) of this clause shall not be construed to be an obligation of the Government for such interest penalty. A cost-reimbursement claim may not include any amount for reimbursement of such interest penalty.

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

(End of clause)

52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER—CENTRAL CONTRACTOR REGISTRATION (OCT 2003)

(a) Method of payment. (1) All payments by the Government under this contract shall be made by electronic funds transfer (EFT), except as provided in paragraph (a)(2) of this clause. As used in this clause, the term “EFT” refers to the funds transfer and may also include the payment information transfer.

(2) In the event the Government is unable to release one or more payments by EFT, the Contractor agrees to either--

(i) Accept payment by check or some other mutually agreeable method of payment; or

(ii) Request the Government to extend the payment due date until such time as the Government can make payment by EFT (but see paragraph (d) of this clause).

(b) Contractor's EFT information. The Government shall make payment to the Contractor using the EFT information contained in the Central Contractor Registration (CCR) database. In the event that the EFT information changes, the Contractor shall be responsible for providing the updated information to the CCR database.

(c) Mechanisms for EFT payment. The Government may make payment by EFT through either the Automated Clearing House (ACH) network, subject to the rules of the National Automated Clearing House Association, or the Fedwire Transfer System. The rules governing Federal payments through the ACH are contained in 31 CFR part 210.

(d) Suspension of payment. If the Contractor's EFT information in the CCR database is incorrect, then the Government need not make payment to the Contractor under this contract until correct EFT information is entered into the CCR database; and any invoice or contract financing request shall be deemed not to be a proper invoice for the purpose of prompt payment under this contract. The prompt payment terms of the contract regarding notice of an improper invoice and delays in accrual of interest penalties apply.

(e) Liability for uncompleted or erroneous transfers. (1) If an uncompleted or erroneous transfer occurs because the Government used the Contractor's EFT information incorrectly, the Government remains responsible for--

(i) Making a correct payment;

(ii) Paying any prompt payment penalty due; and

(iii) Recovering any erroneously directed funds.

(2) If an uncompleted or erroneous transfer occurs because the Contractor's EFT information was incorrect, or was revised within 30 days of Government release of the EFT payment transaction instruction to the Federal Reserve System, and--

(i) If the funds are no longer under the control of the payment office, the Government is deemed to have made payment and the Contractor is responsible for recovery of any erroneously directed funds; or

(ii) If the funds remain under the control of the payment office, the Government shall not make payment, and the provisions of paragraph (d) of this clause shall apply.

(f) EFT and prompt payment. A payment shall be deemed to have been made in a timely manner in accordance with the prompt payment terms of this contract if, in the EFT payment transaction instruction released to the Federal Reserve System, the date specified for settlement of the payment is on or before the prompt payment due date, provided the specified payment date is a valid date under the rules of the Federal Reserve System.

(g) EFT and assignment of claims. If the Contractor assigns the proceeds of this contract as provided for in the assignment of claims terms of this contract, the Contractor shall require as a condition of any such assignment, that the assignee shall register separately in the CCR database and shall be paid by EFT in accordance with the terms of

this clause. Notwithstanding any other requirement of this contract, payment to an ultimate recipient other than the Contractor, or a financial institution properly recognized under an assignment of claims pursuant to subpart 32.8, is not permitted. In all respects, the requirements of this clause shall apply to the assignee as if it were the Contractor. EFT information that shows the ultimate recipient of the transfer to be other than the Contractor, in the absence of a proper assignment of claims acceptable to the Government, is incorrect EFT information within the meaning of paragraph (d) of this clause.

(h) Liability for change of EFT information by financial agent. The Government is not liable for errors resulting from changes to EFT information made by the Contractor's financial agent.

(i) Payment information. The payment or disbursing office shall forward to the Contractor available payment information that is suitable for transmission as of the date of release of the EFT instruction to the Federal Reserve System. The Government may request the Contractor to designate a desired format and method(s) for delivery of payment information from a list of formats and methods the payment office is capable of executing. However, the Government does not guarantee that any particular format or method of delivery is available at any particular payment office and retains the latitude to use the format and delivery method most convenient to the Government. If the Government makes payment by check in accordance with paragraph (a) of this clause, the Government shall mail the payment information to the remittance address contained in the CCR database.

(End of Clause)

52.233-1 DISPUTES. (JUL 2002)

(a) This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C. 601-613).

(b) Except as provided in the Act, all disputes arising under or relating to this contract shall be resolved under this clause.

(c) Claim, as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to this contract. However, a written demand or written assertion by the Contractor seeking the payment of money exceeding $100,000 is not a claim under the Act until certified. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim under the Act. The submission may be converted to a claim under the Act, by complying with the submission and certification requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

(d)(1) A claim by the Contractor shall be made in writing and, unless otherwise stated in this contract, submitted within 6 years after accrual of the claim to the Contracting Officer for a written decision. A claim by the Government against the Contractor shall be subject to a written decision by the Contracting Officer.

(2)(i) The contractors shall provide the certification specified in subparagraph (d)(2)(iii) of this clause when submitting any claim -

(A) Exceeding $100,000; or

(B) Regardless of the amount claimed, when using -

(1) Arbitration conducted pursuant to 5 U.S.C. 575-580; or

(2) Any other alternative means of dispute resolution (ADR) technique that the agency elects to handle in accordance with the Administrative Dispute Resolution Act (ADRA).

(ii) The certification requirement does not apply to issues in controversy that have not been submitted as all or part of a claim.

(iii) The certification shall state as follows: "I certify that the claim is made in good faith; that the supporting data are accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the Contractor believes the Government is liable; and that I am duly authorized to certify the claim on behalf of the Contractor.

(3) The certification may be executed by any person duly authorized to bind the Contractor with respect to the claim.

(e) For Contractor claims of $100,000 or less, the Contracting Officer must, if requested in writing by the Contractor, render a decision within 60 days of the request. For Contractor-certified claims over $100,000, the Contracting Officer must, within 60 days, decide the claim or notify the Contractor of the date by which the decision will be made.

(f) The Contracting Officer's decision shall be final unless the Contractor appeals or files a suit as provided in the Act.

(g) If the claim by the Contractor is submitted to the Contracting Officer or a claim by the Government is presented to the Contractor, the parties, by mutual consent, may agree to use alternative disput resolution (ADR). If the Contractor refuses an offer for ADR, the Contractor shall inform the Contracting Officer, in writing, of the Contractor's specific reasons for rejecting the request.

(h) The Government shall pay interest on the amount found due and unpaid from (1) the date the Contracting Officer receives the claim (certified, if required); or (2) the date that payment otherwise would be due, if that date is later, until the date of payment. With regard to claims having defective certifications, as defined in (FAR) 48 CFR 33.201, interest shall be paid from the date that the Contracting Officer initially receives the claim. Simple interest on claims shall be paid at the rate, fixed by the Secretary of the Treasury as provided in the Act, which is applicable to the period during which the Contracting Officer receives the claim and then at the rate applicable for each 6-month period as fixed by the Treasury Secretary during the pendency of the claim.

(i) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under the contract, and comply with any decision of the Contracting Officer.

(End of clause)

52.233-3 PROTEST AFTER AWARD (AUG. 1996)

(a) Upon receipt of a notice of protest (as defined in FAR 33.101) or a determination that a protest is likely (see FAR 33.102(d)), the Contracting Officer may, by written order to the Contractor, direct the Contractor to stop performance of the work called for by this contract. The order shall be specifically identified as a stop-work order issued under this clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Upon receipt of the final decision in the protest, the Contracting Officer shall either--

(1) Cancel the stop-work order; or

(2) Terminate the work covered by the order as provided in the Default, or the Termination for Convenience of the Government, clause of this contract.

(b) If a stop-work order issued under this clause is canceled either before or after a final decision in the protest, the

Contractor shall resume work. The Contracting Officer shall make an equitable adjustment in the delivery schedule or contract price, or both, and the contract shall be modified, in writing, accordingly, if--

(1) The stop-work order results in an increase in the time required for, or in the Contractor's cost properly allocable to, the performance of any part of this contract; and

(2) The Contractor asserts its right to an adjustment within 30 days after the end of the period of work stoppage; provided, that if the Contracting Officer decides the facts justify the action, the Contracting Officer may receive and act upon a proposal at any time before final payment under this contract.

(c) If a stop-work order is not canceled and the work covered by the order is terminated for the convenience of the Government, the Contracting Officer shall allow reasonable costs resulting from the stop-work order in arriving at the termination settlement.

(d) If a stop-work order is not canceled and the work covered by the order is terminated for default, the Contracting Officer shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop-work order.

(e) The Government's rights to terminate this contract at any time are not affected by action taken under this clause.

(f) If, as the result of the Contractor's intentional or negligent misstatement, misrepresentation, or miscertification, a protest related to this contract is sustained, and the Government pays costs, as provided in FAR 33.102(b)(2) or 33.104(h)(1), the Government may require the Contractor to reimburse the Government the amount of such costs. In addition to any other remedy available, and pursuant to the requirements of Subpart 32.6, the Government may collect this debt by offsetting the amount against any payment due the Contractor under any contract between the Contractor and the Government.

(End of clause)

52.236-2 DIFFERING SITE CONDITIONS (APR 1984)

As prescribed in 36.502, insert the following clause in solicitations and contracts when a fixed-price construction contract or a fixed-price dismantling, demolition, or removal of improvements contract is contemplated and the contract amount is expected to exceed the small purchase limitation. The Contracting Officer may insert the clause in solicitations and contracts when a fixed-price construction or a fixed-price contract for dismantling, demolition, or removal of improvements is contemplated and the contract amount is expected to be within the small purchase limitation.

(a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of

(1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or

(2) unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.

(b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the contract modified in writing accordingly.

(c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed,

unless the Contractor has given the written notice required; provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.

(d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

(End of clause)

52.236-3 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984)

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to

(1) conditions bearing upon transportation, disposal, handling, and storage of materials;

(2) the availability of labor, water, electric power, and roads;

(3) uncertainties of weather, river stages, tides, or similar physical conditions at the site;

(4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Government.

(b) The Government assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Government. Nor does the Government assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

(End of clause)

52.236-5 MATERIAL AND WORKMANSHIP (APR 1984)

(a) All equipment, material, and articles incorporated into the work covered by this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.

(b) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the

performance, capacity, nature, and rating of the machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. When directed to do so, the Contractor shall submit samples for approval at the Contractor's expense, with all shipping charges prepaid. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.

(c) All work under this contract shall be performed in a skillful and workmanlike manner. The Contracting Officer may require, in writing, that the Contractor remove from the work any employee the Contracting Officer deems incompetent, careless, or otherwise objectionable.

(End of clause)

52.236-6 SUPERINTENDENCE BY THE CONTRACTOR (APR 1984)

At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the worksite a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.

(End of clause)

52.236-7 PERMITS AND RESPONSIBILITIES (NOV 1991)

The Contractor shall, without additional expense to the Government, be responsible for obtaining any necessary licenses and permits, and for complying with any Federal, State, and municipal laws, codes, and regulations applicable to the performance of the work. The Contractor shall also be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.

(End of clause)

52.236-8 OTHER CONTRACTS (APR 1984)

The Government may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with Government employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by Government employees.

(End of clause)

52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (APR 1984)

(a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

(b) The Contractor shall protect from damage all existing improvements and utilities

(1) at or near the work site, and

(2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

(End of clause)

52.236-10 OPERATIONS AND STORAGE AREAS (APR 1984)

(a) The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.

(b) Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.

(c) The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

(End of clause)

52.236-11 USE AND POSSESSION PRIOR TO COMPLETION (APR 1984)

(a) The Government shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the Government intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The Government's possession or use shall not be deemed an acceptance of any work under the contract.

(b) While the Government has such possession or use, the Contractor shall be relieved of the responsibility for the loss of or damage to the work resulting from the Government's possession or use, notwithstanding the terms of the clause in this contract entitled "Permits and Responsibilities." If prior possession or use by the Government delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

(End of clause)

52.236-12 CLEANING UP (APR 1984)

The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. Before completing the work, the Contractor shall remove from the work and premises any rubbish, tools, scaffolding, equipment, and materials that are not the property of the Government. Upon completing the work, the Contractor shall leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer.

(End of clause)

52.236-13 ACCIDENT PREVENTION (NOV 1991)

(a) The Contractor shall provide and maintain work environments and procedures which will

(1) safeguard the public and Government personnel, property, materials, supplies, and equipment exposed to Contractor operations and activities;

(2) avoid interruptions of Government operations and delays in project completion dates; and

(3) control costs in the performance of this contract.

(b) For these purposes on contracts for construction or dismantling, demolition, or removal of improvements, the Contractor shall-

(1) Provide appropriate safety barricades, signs, and signal lights;

(2) Comply with the standards issued by the Secretary of Labor at 29 CFR Part 1926 and 29 CFR Part 1910; and

(3) Ensure that any additional measures the Contracting Officer determines to be reasonably necessary for the purposes are taken.

(c) If this contract is for construction or dismantling, demolition or removal of improvements with any Department of Defense agency or component, the Contractor shall comply with all pertinent provisions of the latest version of U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation.

(d) Whenever the Contracting Officer becomes aware of any noncompliance with these requirements or any condition which poses a serious or imminent danger to the health or safety of the public or Government personnel, the Contracting Officer shall notify the Contractor orally, with written confirmation, and request immediate initiation of corrective action. This notice, when delivered to the Contractor or the Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required. After receiving the

notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not be entitled to any equitable adjustment of the contract price or extension of the performance schedule on any stop work order is sued under this clause.

(5) The Contractor shall insert this clause, including this paragraph (e), with appropriate changes in the designation of the parties, in subcontracts.

(End of clause)

52.236-14 AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984)

(a) The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

(b) The Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

(End of clause)

52.236-15 SCHEDULES FOR CONSTRUCTION CONTRACTS (APR 1984)

(a) The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Contracting Officer, prepare and submit to the Contracting Officer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring materials, plant, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments until the Contractor submits the required schedule.

(b) The Contractor shall enter the actual progress on the chart as directed by the Contracting Officer, and upon doing so shall immediately deliver three copies of the annotated schedule to the Contracting Officer. If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

(c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this clause shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the

Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of this contract.

(End of clause)

52.236-17 LAYOUT OF WORK (APR 1984)

The Contractor shall lay out its work from Government established base lines and bench marks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through its negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

(End of clause)

52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB 1997)

(a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

(b) Wherever in the specifications or upon the drawings the words "directed", "required", "ordered", "designated", "prescribed", or words of like import are used, it shall be understood that the "direction", "requirement", "order", "designation", or "prescription", of the Contracting Officer is intended and similarly the words "approved", "acceptable", "satisfactory", or words of like import shall mean "approved by," or "acceptable to", or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.

(c) Where "as shown," as indicated", "as detailed", or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place," that is "furnished and installed".

(d) Shop drawings means drawings, submitted to the Government by the Contractor, subcontractor, or any lower tier subcontractor pursuant to a construction contract, showing in detail (1) the proposed fabrication and assembly of structural elements, and (2) the installation (i.e., fit, and attachment details) of materials or equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the contractor to explain in detail specific portions of the work required by the contract. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for

accuracy, completeness, and compliance with contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the Government's reasons therefor. Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.

(f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Contracting Officer approves any such variation, the Contracting Officer shall issue an appropriate contract modification, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.

(g) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the Contracting Officer and one set will be returned to the Contractor.

(End of clause)

52.236-26 PRECONSTRUCTION CONFERENCE (FEB 1995)

If the Contracting Officer decides to conduct a preconstruction conference, the successful offeror will be notified and will be required to attend. The Contracting Officer's notification will include specific details regarding the date, time, and location of the conference, any need for attendance by subcontractors, and information regarding the items to be discussed.

(End of clause)

52.242-13 BANKRUPTCY (JUL 1995)

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish, by certified mail or electronic commerce method authorized by the contract, written notification of the bankruptcy to the Contracting Officer responsible for administering the contract. This notification shall be furnished within five days of the initiation of the proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identity of the court in which the bankruptcy petition was filed, and a listing of Government contract numbers and contracting offices for all Government contracts against which final payment has not been made. This obligation remains in effect until final payment under this contract.

(End of clause)

52.242-14 SUSPENSION OF WORK (APR 1984)

(a) The Contracting Officer may order the Contractor, in writing, to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of the Government.

(b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified in this contract (or within a reasonable time if not specified), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by the unreasonable suspension, delay, or interruption, and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor, or for which an equitable adjustment is provided for or excluded under any other term or condition of this contract. (c) A claim under this clause shall not be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order), and (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption, but not later than the date of final payment under the contract.

(End of clause)

52.243-4 CHANGES (AUG 1987)

(a) The Contracting Officer may, at any time, without notice to the sureties, if any, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract, including changes--

(1) In the specifications (including drawings and designs);

(2) In the method or manner of performance of the work;

(3) In the Government-furnished facilities, equipment, materials, services, or site; or

(4) Directing acceleration in the performance of the work.

(b) Any other written or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating

(1) the date, circumstances, and source of the order and

(2) that the Contractor regards the order as a change order.

(c) Except as provided in this clause, no order, statement, or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.

(d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for an adjustment based on defective specifications, no adjustment for any change under paragraph (b) of this clause shall be made for any costs incurred more than 20 days before the Contractor gives written notice as required. In the case of defective specifications for which the Government is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.

(e) The Contractor must assert its right to an adjustment under this clause within 30 days after

(1) receipt of a written change order under paragraph (a) of this clause or (2) the furnishing of a written notice under paragraph (b) of this clause, by submitting to the Contracting Officer a written statement describing the general nature and amount of the proposal, unless this period is extended by the Government. The statement of proposal for adjustment may be included in the notice under paragraph (b) above.

(f) No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

(End of clause)

52.245-1 PROPERTY RECORDS (APR 1984)

The Government shall maintain the Government's official property records in connection with Government property under this contract. The Government Property clause is hereby modified by deleting the requirement for the Contractor to maintain such records.

(End of clause)

52.246-12 INSPECTION OF CONSTRUCTION (AUG 1996)

(a) Definition. "Work" includes, but is not limited to, materials, workmanship, and manufacture and fabrication of components.

(b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. The Contractor shall maintain complete inspection records and make them available to the Government. All work shall be conducted under the general direction of the Contracting Officer and is subject to Government inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.

(c) Government inspections and tests are for the sole benefit of the Government and do not--

(1) Relieve the Contractor of responsibility for providing adequate quality control measures;

(2) Relieve the Contractor of responsibility for damage to or loss of the material before acceptance;

(3) Constitute or imply acceptance; or

(4) Affect the continuing rights of the Government after acceptance of the completed work under paragraph (i) of this section.

(d) The presence or absence of a Government inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specification without the Contracting Officer's written authorization.

(e) The Contractor shall promptly furnish, at no increase in contract price, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Contracting Officer. The Government may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary.

The Government shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.

(f) The Contractor shall, without charge, replace or correct work found by the Government not to conform to contract requirements, unless in the public interest the Government consents to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

(g) If the Contractor does not promptly replace or correct rejected work, the Government may (1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor or (2) terminate for default the Contractor's right to proceed.

(h) If, before acceptance of the entire work, the Government decides to examine already completed work by removing it or tearing it out, the Contractor, on request, shall promptly furnish all necessary facilities, labor, and material. If the work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray the expenses of the examination and of satisfactory reconstruction. However, if the work is found to meet contract requirements, the Contracting Officer shall make an equitable adjustment for the additional services involved in the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.

(i) Unless otherwise specified in the contract, the Government shall accept, as promptly as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer determines can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the Government's rights under any warranty or guarantee.

(End of clause)

52.246-21 WARRANTY OF CONSTRUCTION (MAR 1994)

(a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

(b) This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

(c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of--

(1) The Contractor's failure to conform to contract requirements; or

(2) Any defect of equipment, material, workmanship, or design furnished.

(d) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

(e) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.

(f) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.
(g) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall--

(1) Obtain all warranties that would be given in normal commercial practice;

(2) Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and

(3) Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

(h) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(i) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

(j) This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

(End of clause)

52.248-3 VALUE ENGINEERING--CONSTRUCTION (FEB 2000)

(a) General. The Contractor is encouraged to develop, prepare, and submit value engineering change proposals (VECP's) voluntarily. The Contractor shall share in any instant contract savings realized from accepted VECP's, in accordance with paragraph (f) below.

(b) Definitions. "Collateral costs," as used in this clause, means agency costs of operation, maintenance, logistic support, or Government-furnished property.

"Collateral savings," as used in this clause, means those measurable net reductions resulting from a VECP in the agency's overall projected collateral costs, exclusive of acquisition savings, whether or not the acquisition cost changes.

"Contractor's development and implementation costs," as used in this clause, means those costs the Contractor incurs on a VECP specifically in developing, testing, preparing, and submitting the VECP, as well as those costs the Contractor incurs to make the contractual changes required by Government acceptance of a VECP.

"Government costs," as used in this clause, means those agency costs that result directly from developing and implementing the VECP, such as any net increases in the cost of testing, operations, maintenance, and logistic support. The term does not include the normal administrative costs of processing the VECP.

"Instant contract savings," as used in this clause, means the estimated reduction in Contractor cost of performance resulting from acceptance of the VECP, minus allowable Contractor's development and implementation costs, including subcontractors' development and implementation costs (see paragraph (h) below).

"Value engineering change proposal (VECP)" means a proposal that--

(1) Requires a change to this, the instant contract, to implement; and

(2) Results in reducing the contract price or estimated cost without impairing essential functions or characteristics; provided, that it does not involve a change--

(i) In deliverable end item quantities only; or

(ii) To the contract type only.

(c) VECP preparation. As a minimum, the Contractor shall include in each VECP the information described in subparagraphs (1) through (7) below. If the proposed change is affected by contractually required configuration management or similar procedures, the instructions in those procedures relating to format, identification, and priority assignment shall govern VECP preparation. The VECP shall include the following:

(1) A description of the difference between the existing contract requirement and that proposed, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, and the effect of the change on the end item's performance.

(2) A list and analysis of the contract requirements that must be changed if the VECP is accepted, including any suggested specification revisions.

(3) A separate, detailed cost estimate for

(i) the affected portions of the existing contract requirement and

(ii) the VECP. The cost reduction associated with the VECP shall take into account the Contractor's allowable development and implementation costs, including any amount attributable to subcontracts under paragraph (h) below.

(4) A description and estimate of costs the Government may incur in implementing the VECP, such as test and evaluation and operating and support costs.

(5) A prediction of any effects the proposed change would have on collateral costs to the agency.

(6) A statement of the time by which a contract modification accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.

(7) Identification of any previous submissions of the VECP, including the dates submitted, the agencies and contract numbers involved, and previous Government actions, if known.

(d) Submission. The Contractor shall submit VECP's to the Resident Engineer at the worksite, with a copy to the Contracting Officer.

(e) Government action.

(1) The Contracting Officer will notify the Contractor of the status of the VECP within 45 calendar days after the contracting office receives it. If additional time is required, the Contracting Officer will notify the Contractor within the 45-day period and provide the reason for the delay and the expected date of the decision. The Government will process VECP's expeditiously; however, it shall not be liable for any delay in acting upon a VECP.

If the VECP is not accepted, the Contracting Officer will notify the Contractor in writing, explaining the reasons for rejection. The Contractor may withdraw any VECP, in whole or in part, at any time before it is accepted by the Government. The Contracting Officer may require that the Contractor provide written notification before undertaking significant expenditures for VECP effort.

Any VECP may be accepted, in whole or in part, by the Contracting Officer's award of a modification to this contract citing this clause. The Contracting Officer may accept the VECP, even though an agreement on price reduction has not been reached, by issuing the Contractor a notice to proceed with the change. Until a notice to proceed is issued or a contract modification applies a VECP to this contract, the Contractor shall perform in accordance with the existing contract. The decision to accept or reject all or part of any VECP is a unilateral decision made solely at the discretion of the Contracting Officer.

(f) Sharing.

(1) Rates. The Government's share of savings is determined by subtracting Government costs from instant contract savings and multiplying the result by

(i) 45 percent for fixed-price contracts or

(ii) 75 percent for cost-reimbursement contracts.

(2) Payment. Payment of any share due the Contractor for use of a VECP on this contract shall be authorized by a modification to this contract to--

(i) Accept the VECP;

(ii) Reduce the contract price or estimated cost by the amount of instant contract savings; and

(iii) Provide the Contractor's share of savings by adding the amount calculated to the contract price or fee.

(g) Collateral savings. If a VECP is accepted, the Contracting Officer will increase the instant contract amount by 20 percent of any projected collateral savings determined to be realized in a typical year of use after subtracting any Government costs not previously offset. However, the Contractor's share of collateral savings will not exceed the contract's firm-fixed-price or estimated cost, at the time the VECP is accepted, or $100,000, whichever is greater. The Contracting Officer is the sole determiner of the amount of collateral savings.

(h) Subcontracts. The Contractor shall include an appropriate value engineering clause in any subcontract of $50,000 or more and may include one in subcontracts of lesser value. In computing any adjustment in this contract's price under paragraph (f) above, the Contractor's allowable development and implementation costs shall include any subcontractor's allowable development and implementation costs clearly resulting from a VECP accepted by the Government under this contract, but shall exclude any value engineering incentive payments to a subcontractor. The Contractor may choose any arrangement for subcontractor value engineering incentive payments; provided, that these payments shall not reduce the Government's share of the savings resulting from the VECP.

(i) Data. The Contractor may restrict the Government's right to use any part of a VECP or the supporting data by marking the following legend on the affected parts:

"These data, furnished under the Value Engineering-- Construction clause of contract . . . . . , shall not be disclosed outside the Government or duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate a value engineering change proposal submitted under the clause. This restriction does not limit the Government's right to use information contained in these data if it has been obtained or is otherwise available from the Contractor or from another source without limitations." If a VECP is accepted, the Contractor hereby grants the Government unlimited rights in the VECP and supporting data, except that, with respect to data qualifying and

submitted as limited rights technical data, the Government shall have the rights specified in the contract modification implementing the VECP and shall appropriately mark the data. (The terms "unlimited rights" and "limited rights" are defined in Part 27 of the Federal Acquisition Regulation.)

(End of clause)

52.249-2 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (SEP 1996) - ALTERNATE I (SEP 1996)

(a) The Government may terminate performance of work under this contract in whole or, from time to time, in part if the Contracting Officer determines that a termination is in the Government's interest. The Contracting Officer shall terminate by delivering to the Contractor a Notice of Termination specifying the extent of termination and the effective date.

(b) After receipt of a Notice of Termination, and except as directed by the Contracting Officer, the Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due under this clause:

(1) Stop work as specified in the notice.

(2) Place no further subcontracts or orders (referred to as subcontracts in this clause) for materials, services, or facilities, except as necessary to complete the continued portion of the contract.

(3) Terminate all subcontracts to the extent they relate to the work terminated.

(4) Assign to the Government, as directed by the Contracting Officer, all right, title, and interest of the Contractor under the subcontracts terminated, in which case the Government shall have the right to settle or to pay any termination settlement proposal arising out of those terminations.

(5) With approval or ratification to the extent required by the Contracting Officer, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts; the approval or ratification will be final for purposes of this clause.

(6) As directed by the Contracting Officer, transfer title and deliver to the Government (i) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced or acquired for the work terminated, and (ii) the completed or partially completed plans, drawings, information, and other property that, if the contract had been completed, would be required to be furnished to the Government.

(7) Complete performance of the work not terminated.

(8) Take any action that may be necessary, or that the Contracting Officer may direct, for the protection and preservation of the property related to this contract that is in the possession of the Contractor and in which the Government has or may acquire an interest.

(9) Use its best efforts to sell, as directed or authorized by the Contracting Officer, any property of the types referred to in subparagraph (b)(6) of this clause; provided, however, that the Contractor (i) is not required to extend credit to any purchaser and (ii) may acquire the property under the conditions prescribed by, and at prices approved by, the Contracting Officer. The proceeds of any transfer or disposition will be applied to reduce any payments to be made by the Government under this contract, credited to the price or cost of the work, or paid in any other manner directed by the Contracting Officer.

(c) The Contractor shall submit complete termination inventory schedules no later than 120 days from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 120-day period.

(d) After expiration of the plant clearance period as defined in Subpart 45.6 of the Federal Acquisition Regulation, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of termination inventory not previously disposed of, excluding items authorized for disposition by the Contracting Officer. The Contractor may request the Government to remove those items or enter into an agreement for their storage. Within 15 days, the Government will accept title to those items and remove them or enter into a storage agreement. The Contracting Officer may verify the list upon removal of the items, or if stored, within 45 days from submission of the list, and shall correct the list, as necessary, before final settlement.

(e) After termination, the Contractor shall submit a final termination settlement proposal to the Contracting Officer in the form and with the certification prescribed by the Contracting Officer. The Contractor shall submit the proposal promptly, but no later than 1 year from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 1-year period. However, if the Contracting Officer determines that the facts justify it, a termination settlement proposal may be received and acted on after 1 year or any extension. If the Contractor fails to submit the proposal within the time allowed, the Contracting Officer may determine, on the basis of information available, the amount, if any, due the Contractor because of the termination and shall pay the amount determined.

(f) Subject to paragraph (e) of this clause, the Contractor and the Contracting Officer may agree upon the whole or any part of the amount to be paid or remaining to be paid because of the termination. The amount may include a reasonable allowance for profit on work done. However, the agreed amount, whether under this paragraph (g) or paragraph (g) of this clause, exclusive of costs shown in subparagraph (g)(3) of this clause, may not exceed the total contract price as reduced by (1) the amount of payments previously made and (2) the contract price of work not terminated. The contract shall be modified, and the Contractor paid the agreed amount. Paragraph (g) of this clause shall not limit, restrict, or affect the amount that may be agreed upon to be paid under this paragraph.

(g) If the Contractor and Contracting Officer fail to agree on the whole amount to be paid the Contractor because of the termination of work, the Contracting Officer shall pay the Contractor the amounts determined as follows, but without duplication of any amounts agreed upon under paragraph (f) of this clause:

(1) For contract work performed before the effective date of termination, the total (without duplication of any items) of--

(i) The cost of this work;

(ii) The cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the contract if not included in subdivision (g)(1)(i) of this clause; and

(iii) A sum, as profit on subdivision (g)(1)(i) of this clause, determined by the Contracting Officer under 49.202 of the Federal Acquisition Regulation, in effect on the date of this contract, to be fair and reasonable; however, if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, the Contracting Officer shall allow no profit under this subdivision (iii) and shall reduce the settlement to reflect the indicated rate of loss.

(2) The reasonable costs of settlement of the work terminated, including--

(i) Accounting, legal, clerical, and other expenses reasonably necessary for the preparation of termination settlement proposals and supporting data;

(ii) The termination and settlement of subcontracts (excluding the amounts of such settlements); and

(iii) Storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

(h) Except for normal spoilage, and except to the extent that the Government expressly assumed the risk of loss, the Contracting Officer shall exclude from the amounts payable to the Contractor under paragraph (g) of this clause, the fair value, as determined by the Contracting Officer, of property that is destroyed, lost, stolen, or damaged so as to become undeliverable to the Government or to a buyer.

(i) The cost principles and procedures of Part 31 of the Federal Acquisition Regulation, in effect on the date of this contract, shall govern all costs claimed, agreed to, or determined under this clause.

(j) The Contractor shall have the right of appeal, under the Disputes clause, from any determination made by the Contracting Officer under paragraph (e), (g), or (l) of this clause, except that if the Contractor failed to submit the termination settlement proposal or request for equitable adjustment within the time provided in paragraph (e) or (l), respectively, and failed to request a time extension, there is no right of appeal.

(k) In arriving at the amount due the Contractor under this clause, there shall be deducted--

(1) All unliquidated advance or other payments to the Contractor under the terminated portion of this contract;

(2) Any claim which the Government has against the Contractor under this contract; and

(3) The agreed price for, or the proceeds of sale of, materials, supplies, or other things acquired by the Contractor or sold under the provisions of this clause and not recovered by or credited to the Government.

(l) If the termination is partial, the Contractor may file a proposal with the Contracting Officer for an equitable adjustment of the price(s) of the continued portion of the contract. The Contracting Officer shall make any equitable adjustment agreed upon. Any proposal by the Contractor for an equitable adjustment under this clause shall be requested within 90 days from the effective date of termination unless extended in writing by the Contracting Officer.

(m)(1) The Government may, under the terms and conditions it prescribes, make partial payments and payments against costs incurred by the Contractor for the terminated portion of the contract, if the Contracting Officer believes the total of these payments will not exceed the amount to which the Contractor will be entitled.

(2) If the total payments exceed the amount finally determined to be due, the Contractor shall repay the excess to the Government upon demand, together with interest computed at the rate established by the Secretary of the Treasury under 50 U.S.C. App. 1215(b)(2). Interest shall be computed for the period from the date the excess payment is received by the Contractor to the date the excess is repaid. Interest shall not be charged on any excess payment due to a reduction in the Contractor's termination settlement proposal because of retention or other disposition of termination inventory until 10 days after the date of the retention or disposition, or a later date determined by the Contracting Officer because of the circumstances.

(n) Unless otherwise provided in this contract or by statute, the Contractor shall maintain all records and documents relating to the terminated portion of this contract for 3 years after final settlement. This includes all books and other evidence bearing on the Contractor's costs and expenses under this contract. The Contractor shall make these records and documents available to the Government, at the Contractor's office, at all reasonable times, without any direct charge. If approved by the Contracting Officer, photographs, microphotographs, or other authentic reproductions may be maintained instead of original records and documents.

(End of clause)

52.249-10 DEFAULT (FIXED-PRICE CONSTRUCTION) (APR 1984)

(a) If the Contractor refuses or fails to prosecute the work or any separable part, with the diligence that will insure its completion within the time specified in this contract including any extension, or fails to complete the work within this time, the Government may, by written notice to the Contractor, terminate the right to proceed with the work (or the separable part of the work) that has been delayed. In this event, the Government may take over the work and complete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the Government resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the Government in completing the work.

(b) The Contractor's right to proceed shall not be terminated nor the Contractor charged with damages under this clause, if--

(1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include

(i) acts of God or of the public enemy,

(ii) acts of the Government in either its sovereign or contractual capacity,

(iii) acts of another Contractor in the performance of a contract with the Government,

(iv) fires,

(v) floods,

(vi) epidemics,

(vii) quarantine restrictions,

(viii) strikes,

(ix) freight embargoes,

(x) unusually severe weather, or delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and

(2) The Contractor, within 10 days from the beginning of any delay (unless extended by the Contracting Officer), notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, the time for completing the work shall be extended. The findings of the Contracting Officer shall be final and conclusive on the parties, but subject to appeal under the Disputes clause.

(c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of the Government.

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

(End of clause)

52.253-1 COMPUTER GENERATED FORMS (JAN 1991)

(a) Any data required to be submitted on a Standard or Optional Form prescribed by the Federal Acquisition Regulation (FAR) may be submitted on a computer generated version of the form, provided there is no change to the name, content, or sequence of the data elements on the form, and provided the form carries the Standard or Optional Form number and edition date.

(b) Unless prohibited by agency regulations, any data required to be submitted on an agency unique form prescribed by an agency supplement to the FAR may be submitted on a computer generated version of the form provided there is no change to the name, content, or sequence of the data elements on the form and provided the form carries the agency form number and edition date.

(6) If the Contractor submits a computer generated version of a form that is different than the required form, then the rights and obligations of the parties will be determined based on the content of the required form.

(End of clause)

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

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

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

(End of clause)

252.203-7001 PROHIBITION ON PERSONS CONVICTED OF FRAUD OR OTHER DEFENSE-CONTRACT-RELATED FELONIES (MAR 1999)

(a) Definitions. As used in this clause—

(1) “Arising out of a contract with the DoD” means any act in connection with—

(i) Attempting to obtain;

(ii) Obtaining, or

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

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

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

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

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

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

(3) As a consultant, agent, or representative for any DoD contractor or first-tier subcontractor; or

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

(c) Unless waived, the prohibition in paragraph (b) of this clause applies for not less than 5 years from the date of conviction.

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

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

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

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

(1) Suspension or debarment;

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

(3) Termination of the contract for default.

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

(1) The person involved;

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

(3) The reasons for the requested waiver; and

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

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

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

(End of clause)

252.203-7002 DISPLAY OF DOD HOTLINE POSTER (DEC 1991)

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

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

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

(End of clause)

252.204-7000 DISCLOSURE OF INFORMATION (DEC 1991)

(a) The Contractor shall not release to anyone outside the Contractor's organization any unclassified information, regardless of medium (e.g., film, tape, document), pertaining to any part of this contract or any program related to this contract, unless--

(1) The Contracting Officer has given prior written approval; or

(2) The information is otherwise in the public domain before the date of release.

(b) Requests for approval shall identify the specific information to be released, the medium to be used, and the purpose for the release. The Contractor shall submit its request to the Contracting Officer at least 45 days before the proposed date for release.

(c) The Contractor agrees to include a similar requirement in each subcontract under this contract. Subcontractors shall submit requests for authorization to release through the prime contractor to the Contracting Officer.

(End of clause)

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

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

(End of clause)

252.209-7000 ACQUISITION FROM SUBCONTRACTORS SUBJECT TO ONSITE INSPECTION UNDER THE INTERMEDIATE-RANGE NUCLEAR FORCES (INF) TREATY (NOV 1995)

(a) The Contractor shall not deny consideration for a subcontract award under this contract to a potential subcontractor subject to on-site inspection under the INF Treaty, or a similar treaty, solely or in part because of the actual or potential presence of Soviet inspectors at the subcontractor's facility, unless the decision is approved by the Contracting Officer.

(b) The Contractor shall incorporate this clause, including this paragraph (b), in all solicitations and contracts exceeding the simplified acquisition threshold in part 13 of the Federal Acquisition Regulation, except those for commercial items.

(End of clause)

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

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

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

(End of clause)

252.219-7009 SECTION 8(A) DIRECT AWARD (MAR 2002)

(a) This contract is issued as a direct award between the contracting office and the 8(a) Contractor pursuant to the Partnership Agreement dated February 1, 2002, between the Small Business Administration (SBA) and the Department of Defense. Accordingly, the SBA, even if not identified in Section A of this contract, is the prime contractor and retains responsibility for 8(a) certification, for 8(a) eligibility determinations and related issues, and for providing counseling and assistance to the 8(a) Contractor under the 8(a) Program. The cognizant SBA district office is:

Deputy District Director
Small Business Administration (SBA)
510 “L” Street #310
Anchorage, AK 99501

(b) The contracting office is responsible for administering the contract and for taking any action on behalf of the Government under the terms and conditions of the contract; provided that the contracting office shall give advance notice to the SBA before it issues a final notice terminating performance, either in whole or in part, under the contract.

The contracting office also shall coordinate with the SBA prior to processing any novation agreement. The contracting office may assign contract administration functions to a contract administration office.

(c) The Contractor agrees that--

(1) It will notify the Contracting Officer, simultaneous with its notification to the SBA (as required by SBA's 8(a) regulations at 13 CFR 124.308), when the owner or owners upon whom 8(a) eligibility is based plan to relinquish ownership or control of the concern. Consistent with Section 407 of Pub. L. 100-656, transfer of ownership or control shall result in termination of the contract for convenience, unless the SBA waives the requirement for termination prior to the actual relinquishing of ownership and control; and

(2) It will not subcontract the performance of any of the requirements of this contract without the prior written approval of the SBA and the Contracting Officer.

(End of Clause)

252.219-7010 ALTERNATE A (JUN 1998)

(a) Offers are solicited only from small business concerns expressly certified by the Small Business Administration (SBA) for participation in the SBA's 8(a) Program and which meet the following criteria at the time of submission of offer--

(1) The Offeror is in conformance with the 8(a) limitation set forth in its approved business plan; and

(2) The Offeror is in conformance with the Business Activity Targets set forth in its approved business plan or any remedial action directed by the SBA.

(b) By submission of its offer, the Offeror represents that it meets all of the criteria set forth in paragraph (a) of this clause.

(c) Any award resulting from this solicitation will be made directly by the Contracting Officer to the successful 8(a) offeror selected through the evaluation criteria set forth in this solicitation.

(d)(1) Agreement. A small business concern submitting an offer in its own name agrees to furnish, in performing the contract, only end items manufactured or produced by small business concerns in the United States. The term "United States" includes its territories and possessions, the Commonwealth of Puerto Rico, the trust territory of the Pacific Islands, and the District of Columbia. If this procurement is processed under simplified acquisition procedures and the total amount of this contract does not exceed $25,000, a small business concern may furnish the product of any domestic firm. This subparagraph does not apply in connection with construction or service contracts.

(2) The successful offeror will notify the US Army Corps of Engineers-Alaska District Contracting Officer in writing immediately upon entering an agreement (either oral or written) to transfer all or part of its stock or other ownership interest to any other party.

(End of clause)

252.222-7000 RESTRICTIONS ON EMPLOYMENT OF PERSONNEL (MAR 2000)

(a) The Contractor shall employ, for the purpose of performing that portion of the contract work in Alaska, individuals who are residents thereof and who, in the case of any craft or trade, possess or would be able to acquire promptly the necessary skills to perform the contract.

(b) The Contractor shall insert the substance of this clause, including this paragraph (b), in each subcontract awarded under this contract.

(End of clause)

252.223-7001 HAZARD WARNING LABELS (DEC 1991)

(a) "Hazardous material," as used in this clause, is defined in the Hazardous Material Identification and Material Safety Data clause of this contract.

(b) The Contractor shall label the item package (unit container) of any hazardous material to be delivered under this contract in accordance with the Hazard Communication Standard (29 CFR 1910.1200 et seq). The Standard requires that the hazard warning label conform to the requirements of the standard unless the material is otherwise subject to the labeling requirements of one of the following statutes:

(1) Federal Insecticide, Fungicide and Rodenticide Act;

(2) Federal Food, Drug and Cosmetics Act;

(3) Consumer Product Safety Act;

(4) Federal Hazardous Substances Act; or

(5) Federal Alcohol Administration Act.

(c) The Offeror shall list which hazardous material listed in the Hazardous Material Identification and Material Safety Data clause of this contract will be labeled in accordance with one of the Acts in paragraphs (b)(1) through (5) of this clause instead of the Hazard Communication Standard. Any hazardous material not listed will be interpreted to mean that a label is required in accordance with the Hazard Communication Standard.

MATERIAL (If None, Insert "None.")	ACT
_____	_____
_____	_____

(d) The apparently successful Offeror agrees to submit, before award, a copy of the hazard warning label for all hazardous materials not listed in paragraph (c) of this clause. The Offeror shall submit the label with the Material Safety Data Sheet being furnished under the Hazardous Material Identification and Material Safety Data clause of this contract.

(e) The Contractor shall also comply with MIL-STD-129, Marking for Shipment and Storage (including revisions adopted during the term of this contract).

(End of clause)

252.223-7004 DRUG-FREE WORK FORCE (SEP 1988)

(a) Definitions.

(1) "Employee in a sensitive position," as used in this clause, means an employee who has been granted access to classified information; or employees in other positions that the Contractor determines involve national security; health or safety, or functions other than the foregoing requiring a high degree of trust and confidence.

(2) "Illegal drugs," as used in this clause, means controlled substances included in Schedules I and II, as defined by section 802(6) of title 21 of the United States Code, the possession of which is unlawful under chapter 13 of that Title. The term "illegal drugs" does not mean the use of a controlled substance pursuant to a valid prescription or other uses authorized by law.

(b) The Contractor agrees to institute and maintain a program for achieving the objective of a drug-free work force. While this clause defines criteria for such a program, contractors are encouraged to implement alternative approaches comparable to the criteria in paragraph (c) that are designed to achieve the objectives of this clause.

(c) Contractor programs shall include the following, or appropriate alternatives:

(1) Employee assistance programs emphasizing high level direction, education, counseling, rehabilitation, and coordination with available community resources;

(2) Supervisory training to assist in identifying and addressing illegal drug use by Contractor employees;

(3) Provision for self-referrals as well as supervisory referrals to treatment with maximum respect for individual confidentiality consistent with safety and security issues;

(4) Provision for identifying illegal drug users, including testing on a controlled and carefully monitored basis. Employee drug testing programs shall be established taking account of the following:

(i) The Contractor shall establish a program that provides for testing for the use of illegal drugs by employees in sensitive positions. The extent of and criteria for such testing shall be determined by the Contractor based on considerations that include the nature of the work being performed under the contract, the employee's duties, and efficient use of Contractor resources, and the risks to health, safety, or national security that could result from the failure of an employee adequately to discharge his or her position.

(ii) In addition, the Contractor may establish a program for employee drug testing--

(A) When there is a reasonable suspicion that an employee uses illegal drugs; or

(B) When an employees has been involved in an accident or unsafe practice;

(C) As part of or as a follow-up to counseling or rehabilitation for illegal drug use;

(D) As part of a voluntary employee drug testing program.

(iii) The Contractor may establish a program to test applicants for employment for illegal drug use.

(iv) For the purpose of administering this clause, testing for illegal drugs may be limited to those substances for which testing is prescribed by section 2..1 of subpart B of the "Mandatory Guidelines for Federal Workplace Drug Testing Programs" (53 FR 11980 (April 11, 1988), issued by the Department of Health and Human Services.

(d) Contractors shall adopt appropriate personnel procedures to deal with employees who are found to be using drugs illegally. Contractors shall not allow any employee to remain on duty or perform in a sensitive position who is

found to use illegal drugs until such times as the Contractor, in accordance with procedures established by the Contractor, determines that the employee may perform in such a position.

(e) The provisions of this clause pertaining to drug testing program shall not apply to the extent that are inconsistent with state or local law, or with an existing collective bargaining agreement; provided that with respect to the latter, the Contractor agrees those issues that are in conflict will be a subject of negotiation at the next collective bargaining session.

(End of clause)

252.223-7006 PROHIBITION ON STORAGE AND DISPOSAL OF TOXIC AND HAZARDOUS MATERIALS (APR 1993)

(a) "Definitions".

As used in this clause --

(1) "Storage" means a non-transitory, semi-permanent or permanent holding, placement, or leaving of material. It does not include a temporary accumulation of a limited quantity of a material used in or a waste generated or resulting from authorized activities, such as servicing, maintenance, or repair of Department of Defense (DoD) items, equipment, or facilities.

(2) "Toxic or hazardous materials" means:

(i) Materials referred to in section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 U.S.C. 9601(14)) and materials designated under section 102 of CERCLA (42 U.S.C. 9602) (40 CFR part 302);

(ii) Materials that are of an explosive, flammable, or pyrotechnic nature; or

(iii) Materials otherwise identified by the Secretary of Defense as specified in DoD regulations.

(b) In accordance with 10 U.S.C. 2692, the Contractor is prohibited from storing or disposing of non-DoD-owned toxic or hazardous materials on a DoD installation, except to the extent authorized by a statutory exception to 10 U.S.C. 2692 or as authorized by the Secretary of Defense or his designee.

(End of clause)

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

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

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

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

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

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

(iii) Any foreign subsidiary or affiliate (including any permanent foreign establishment) of any domestic concern that is controlled in fact by such domestic concern.

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

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

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

(End of provision)

252.226-7001 UTILIZATION OF INDIAN ORGANIZATIONS AND INDIAN-OWNED ECONOMIC ENTERPRISES, AND HAWAIIAN SMALL BUSINESS CONCERNS (OCT 2003)

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

Indian means any person who is a member of any Indian tribe, band, group, pueblo, or community that is recognized by the Federal Government as eligible for services from the Bureau of Indian Affairs (BIA) in accordance with 25 U.S.C. 1452(c) and any ``Native" as defined in the Alaska Native Claims Settlement Act (43 U.S.C. 1601).

Indian organization means the governing body of any Indian tribe or entity established or recognized by the governing body of an Indian tribe for the purposes of 25 U.S.C. chapter 17.

Indian-owned economic enterprise means any Indian-owned (as determined by the Secretary of the Interior) commercial, industrial, or business activity established or organized for the purpose of profit, provided that Indian ownership constitutes not less than 51 percent of the enterprise.

Indian tribe means any Indian tribe, band, group, pueblo, or community, including native villages and native groups (including corporations organized by Kenai, Juneau, Sitka, and Kodiak) as defined in the Alaska Native Claims Settlement Act, that is recognized by the Federal Government as eligible for services from BIA in accordance with 25 U.S.C. 1452(c).

Interested party means a contractor or an actual or prospective offeror whose direct economic interest would be affected by the award of a subcontract or by the failure to award a subcontract.

Native Hawaiian small business concern means an entity that is --

(1) A small business concern as defined in section 3 of the Small Business Act (15 U.S.C. 632) and relevant implementing regulations; and

(2) Owned and controlled by a Native Hawaiian as defined in 25 U.S.C. 4221(9).

(b) The Contractor shall use its best efforts to give Indian organizations, Indian-owned economic enterprises, and Native Hawaiian small business concerns the maximum practicable opportunity to participate in the subcontracts it awards, to the fullest extent consistent with efficient performance of the contract.

(c) The Contracting Officer and the Contractor, acting in good faith, may rely on the representation of an Indian organization, Indian-owned economic enterprise, or Native Hawaiian small business concern as to its eligibility,

unless an interested party challenges its status or the Contracting Officer has independent reason to question that status.

(d) In the event of a challenge to the representation of a subcontractor, the Contracting Officer will refer the matter to--

(1) For matters relating to Indian organizations or Indian-owned economic enterprises: U.S. Department of the Interior, Bureau of Indian Affairs, Attn: Chief, Division of Contracting and Grants Administration, 1849 C Street NW, MS-2626-MIB, Washington, DC 20240-4000. The BIA will determine the eligibility and will notify the Contracting Officer.

(2) For matters relating to Native Hawaiian small business concerns: Department of Hawaiian Home Lands, PO Box 1879, Honolulu, HI 96805. The Department of Hawaiian Home Lands will determine the eligibility and will notify the Contracting Officer.

(e) No incentive payment will be made--

(1) While a challenge is pending; or

(2) If a subcontractor is determined to be an ineligible participant.

(f)(1) The Contractor, on its own behalf or on behalf of a subcontractor at any tier, may request an incentive payment in accordance with this clause.

(2) The incentive amount that may be requested is 5 percent of the estimated cost, target cost, or fixed price included in the subcontract at the time of award to the Indian organization, Indian-owned economic enterprise, or Native Hawaiian small business concern.

(3) In the case of a subcontract for commercial items, the Contractor may receive an incentive payment only if the subcontracted items are produced or manufactured in whole or in part by an Indian organization, Indian-owned economic enterprise, or Native Hawaiian small business concern.

(4) The Contractor has the burden of proving the amount claimed and shall assert its request for an incentive payment prior to completion of contract performance.

(5) The Contracting Officer, subject to the terms and conditions of the contract and the availability of funds, will authorize an incentive payment of 5 percent of the estimated cost, target cost, or fixed price included in the subcontract awarded to the Indian organization, Indian-owned economic enterprise, or Native Hawaiian small business concern.

(6) If the Contractor requests and receives an incentive payment on behalf of a subcontractor, the Contractor is obligated to pay the subcontractor the incentive amount.

(g) The Contractor shall insert the substance of this clause, including this paragraph (g), in all subcontracts exceeding $500,000 for which further subcontracting opportunities may exist.

(End of clause)

252.227-7033 RIGHTS IN SHOP DRAWINGS (APR 1966)

(a) Shop drawings for construction means drawings, submitted to the Government by the Construction Contractor, subcontractor or any lower-tier subcontractor pursuant to a construction contract, showing in detail (i) the proposed fabrication and assembly of structural elements and (ii) the installation (i.e., form, fit, and attachment details) of materials or equipment. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(b) This clause, including this paragraph (b), shall be included in all subcontracts hereunder at any tier.

252.231-7000 SUPPLEMENTAL COST PRINCIPLES (DEC 1991)

When the allowability of costs under this contract is determined in accordance with part 31 of the Federal Acquisition Regulation (FAR), allowability shall also be determined in accordance with part 231 of the Defense FAR Supplement, in effect on the date of this contract.

(End of clause)

252.236-7000 MODIFICATION PROPOSALS - PRICE BREAKDOWN. (DEC 1991)

(a) The Contractor shall furnish a price breakdown, itemized as required and within the time specified by the Contracting Officer, with any proposal for a contract modification.

(b) The price breakdown --

(1) Must include sufficient detail to permit an analysis of profit, and of all costs for --

(i) Material;

(ii) Labor;

(iii) Equipment;

(iv) Subcontracts; and

(v) Overhead; and

(2) Must cover all work involved in the modification, whether the work was deleted, added, or changed.

(c) The Contractor shall provide similar price breakdowns to support any amounts claimed for subcontracts.

(d) The Contractor's proposal shall include a justification for any time extension proposed.

252.236-7001 CONTRACT DRAWINGS, MAPS, AND SPECIFICATIONS (AUG 2000)

(a) The Government will provide to the Contractor, without charge, one set of contract drawings and specifications, except publications incorporated into the technical provisions by reference, in electronic or paper media as chosen by the Contracting Officer.

(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;

(4) Be responsible for any errors that might have been avoided by complying with this paragraph (b); and

(5) Reproduce and print contract drawings and specifications as needed.

(c) In general--

(1) Large-scale drawings shall govern small-scale drawings; and

(2) The Contractor shall follow figures marked on drawings in preference to scale measurements.

(d) Omissions from the drawings or specifications or the misdescription of details of work that are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work. The Contractor shall perform such details 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 on the following index of drawings:

Title File

SEE SECTION 00800

(End of clause)

252.236-7008 CONTRACT PRICES - BIDDING SCHEDULES. (DEC 1991)

(a) The Government's payment for the items listed in the Bidding Schedule shall constitute full compensation to the Contractor for --

(1) Furnishing all plant, labor, equipment, appliances, and materials; and

(2) Performing all operations required to complete the work in conformity with the drawings and specifications.

(b) The Contractor shall include in the prices for the items listed in the Bidding Schedule all costs for work in the specifications, whether or not specifically listed in the Bidding Schedule.

252.242-7000 POSTAWARD CONFERENCE (DEC 1991)

The Contractor agrees to attend any postaward conference convened by the contracting activity or contract administration office in accordance with Federal Acquisition Regulation subpart 42.5.

(End of clause)

252.243-7001 PRICING OF CONTRACT MODIFICATIONS (DEC 1991)

When costs are a factor in any price adjustment under this contract, the contract cost principles and procedures in FAR part 31 and DFARS part 231, in effect on the date of this contract, apply.

252.243-7002 REQUESTS FOR EQUITABLE ADJUSTMENT (MAR 1998)

(a) The amount of any request for equitable adjustment to contract terms shall accurately reflect the contract adjustment for which the Contractor believes the Government is liable. The request shall include only costs for performing the change, and shall not include any costs that already have been reimbursed or that have been separately claimed. All indirect costs included in the request shall be properly allocable to the change in accordance with applicable acquisition regulations.

(b) In accordance with 10 U.S.C. 2410(a), any request for equitable adjustment to contract terms that exceeds the simplified acquisition threshold shall bear, at the time of submission, the following certificate executed by an individual authorized to certify the request on behalf of the Contractor:

I certify that the request is made in good faith, and that the supporting data are accurate and complete to the best of my knowledge and belief.

(Official's Name)

(Title)

(c) The certification in paragraph (b) of this clause requires full disclosure of all relevant facts, including--

(1) Cost or pricing data if required in accordance with subsection 15.403-4 of the Federal Acquisition Regulation (FAR); and

(2) Information other than cost or pricing data, in accordance with subsection 15.403-3 of the FAR, including actual cost data and data to support any estimated costs, even if cost or pricing data are not required.

(d) The certification requirement in paragraph (b) of this clause does not apply to----

(1) Requests for routine contract payments; for example, requests for payment for accepted supplies and services, routine vouchers under a cost-reimbursement type contract, or progress payment invoices; or

(2) Final adjustment under an incentive provision of the contract.

252.247-7023 TRANSPORTATION OF SUPPLIES BY SEA (MAY 2002)

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

(1) "Components" means articles, materials, and supplies incorporated directly into end products at any level of manufacture, fabrication, or assembly by the Contractor or any subcontractor.

(2) "Department of Defense" (DoD) means the Army, Navy, Air Force, Marine Corps, and defense agencies.

(3) "Foreign flag vessel" means any vessel that is not a U.S.-flag vessel.

(4) "Ocean transportation" means any transportation aboard a ship, vessel, boat, barge, or ferry through international waters.

(5) "Subcontractor" means a supplier, materialman, distributor, or vendor at any level below the prime contractor whose contractual obligation to perform results from, or is conditioned upon, award of the prime contract and who is performing any part of the work or other requirement of the prime contract.

(6) "Supplies" means all property, except land and interests in land, that is clearly identifiable for eventual use by or owned by the DoD at the time of transportation by sea.

(i) An item is clearly identifiable for eventual use by the DoD if, for example, the contract documentation contains a reference to a DoD contract number or a military destination.

(ii) "Supplies" includes (but is not limited to) public works; buildings and facilities; ships; floating equipment and vessels of every character, type, and description, with parts, subassemblies, accessories, and equipment; machine tools; material; equipment; stores of all kinds; end items; construction materials; and components of the foregoing.

(7) "U.S.-flag vessel" means a vessel of the United States or belonging to the United States, including any vessel registered or having national status under the laws of the United States.

(b)(1) The Contractor shall use U.S.-flag vessels when transporting any supplies by sea under this contract.

(2) A subcontractor transporting supplies by sea under this contract shall use U.S.-flag vessels if--

(i) This contract is a construction contract; or

(ii) The supplies being transported are--

(A) Noncommercial items; or

(B) Commercial items that--

(1) The Contractor is reselling or distributing to the Government without adding value (generally, the Contractor does not add value to items that it contracts for f.o.b. destination shipment);

(2) Are shipped in direct support of U.S. military contingency operations, exercises, or forces deployed in humanitarian or peacekeeping operations; or

(3) Are commissary or exchange cargoes transported outside of the Defense Transportation System in accordance with 10 U.S.C. 2643.

(c) The Contractor and its subcontractors may request that the Contracting Officer authorize shipment in foreign-flag vessels, or designate available U.S.-flag vessels, if the Contractor or a subcontractor believes that --

(1) U.S.-flag vessels are not available for timely shipment;

(2) The freight charges are inordinately excessive or unreasonable; or

(3) Freight charges are higher than charges to private persons for transportation of like goods.

(d) The Contractor must submit any request for use of other than U.S.-flag vessels in writing to the Contracting Officer at least 45 days prior to the sailing date necessary to meet its delivery schedules. The Contracting Officer will

process requests submitted after such date(s) as expeditiously as possible, but the Contracting Officer's failure to grant approvals to meet the shipper's sailing date will not of itself constitute a compensable delay under this or any other clause of this contract. Requests shall contain at a minimum --

(1) Type, weight, and cube of cargo;

(2) Required shipping date;

(3) Special handling and discharge requirements;

(4) Loading and discharge points;

(5) Name of shipper and consignee;

(6) Prime contract number; and

(7) A documented description of efforts made to secure U.S.-flag vessels, including points of contact (with names and telephone numbers) with at least two U.S.-flag carriers contacted. Copies of telephone notes, telegraphic and facsimile message or letters will be sufficient for this purpose.

(e) The Contractor shall, within 30 days after each shipment covered by this clause, provide the Contracting Officer and the Maritime Administration, Office of Cargo Preference, U.S. Department of Transportation, 400 Seventh Street SW., Washington, DC 20590, one copy of the rated on board vessel operating carrier's ocean bill of lading, which shall contain the following information:

(1) Prime contract number;

(2) Name of vessel;

(3) Vessel flag of registry;

(4) Date of loading;

(5) Port of loading;

(6) Port of final discharge;

(7) Description of commodity;

(8) Gross weight in pounds and cubic feet if available;

(9) Total ocean freight in U.S. dollars; and

(10) Name of the steamship company.

(f) The Contractor shall provide with its final invoice under this contract a representation that to the best of its knowledge and belief--

(1) No ocean transportation was used in the performance of this contract;

(2) Ocean transportation was used and only U.S.-flag vessels were used for all ocean shipments under the contract;

(3) Ocean transportation was used, and the Contractor had the written consent of the Contracting Officer for all non-

U.S.-flag ocean transportation; or

(4) Ocean transportation was used and some or all of the shipments were made on non-U.S.-flag vessels without the written consent of the Contracting Officer. The Contractor shall describe these shipments in the following format:

ITEM DESCRIPTION	CONTRACT LINE ITEMS	QUANTITY

TOTAL_____

(g) If the final invoice does not include the required representation, the Government will reject and return it to the Contractor as an improper invoice for the purposes of the Prompt Payment clause of this contract. In the event there has been unauthorized use of non-U.S.-flag vessels in the performance of this contract, the Contracting Officer is entitled to equitably adjust the contract, based on the unauthorized use.

(h) In the award of subcontracts for the types of supplies described in paragraph (b)(2) of this clause, the Contractor shall flow down the requirements of this clause as follows:

(1) The Contractor shall insert the substance of this clause, including this paragraph (h), in subcontracts that exceed the simplified acquisition threshold in part 2 of the Federal Acquisition Regulation.

(2) The Contractor shall insert the substance of paragraphs (a) through (e) of this clause, and this paragraph (h), in subcontracts that are at or below the simplified acquisition threshold in part 2 of the Federal Acquisition Regulation.

(End of clause)

252.247-7024 NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)

(a) The Contractor has indicated by the response to the solicitation provision, Representation of Extent of Transportation by Sea, that it did not anticipate transporting by sea any supplies. If, however, after the award of this contract, the Contractor learns that supplies, as defined in the Transportation of Supplies by Sea clause of this contract, will be transported by sea, the Contractor --

(1) Shall notify the Contracting Officer of that fact; and

(2) Hereby agrees to comply with all the terms and conditions of the Transportation of Supplies by Sea clause of this contract.

(b) The Contractor shall include this clause; including this paragraph (b), revised as necessary to reflect the relationship of the contracting parties--

(1) In all subcontracts under this contract, if this contract is a construction contract; or

(2) If this contract is not a construction contract, in all subcontracts under this contract that are for--

(i) Noncommercial items; or

(ii) Commercial items that--

(A) The Contractor is reselling or distributing to the Government without adding value (generally, the Contractor does not add value to items that it subcontracts for f.o.b. destination shipment);

(B) Are shipped in direct support of U.S. military contingency operations, exercises, or forces deployed in humanitarian or peacekeeping operations; or

(C) Are commissary or exchange cargoes transported outside of the Defense Transportation System in accordance with 10 U.S.C. 2643.

(End of clause)

SECTION 00700a
General Wage Decision AK030001
(Dated (06/13/2003)
Modification Record:

No.	Publication Date
0	06/13/2003
1	11/28/2003
2	02/06/2004
3	03/05/2004
4	04/02/2004
5	04/16/2004
6	05/14/2004
7	06/18/2004

General Decision Number: AK030001 06/18/2004
Superseded General Decision Number: AK020001
State: Alaska
Construction Types: Building and Heavy
Counties: Alaska Statewide.
BUILDING AND HEAVY CONSTRUCTION PROJECTS (does not include residential construction consisting of single family homes and apartments up to and including 4 stories)

Modification Number	Publication Date
0	06/13/2003
1	11/28/2003
2	02/06/2004
3	03/05/2004
4	04/02/2004
5	04/16/2004
6	05/14/2004
7	06/18/2004

ASBE0097-001 01/01/2004

	Rates	Fringes
Asbestos Workers/Insulator (includes application of all insulating materials protective coverings, coatings and finishings to all types of mechanical systems)	$ 29.63	9.42

ASBE0097-002 01/01/2004

	Rates	Fringes
Hazardous Material Handler (includes preparation, wetting, stripping, removal scrapping, vacuming, bagging, and disposing of all insulation materials, whether they contain asbestos or not, from mechanical systems)	$ 26.45	9.42

BOIL0502-002 01/01/2004

	Rates	Fringes
Boilermaker	$ 35.23	15.37

BRAK0001-002 07/01/2003

	Rates	Fringes
Bricklayer, Blocklayer, Stonemason, Marble Mason, Tile Setter, Terrazzo Worker	$ 30.13	11.80
Tile & Terrazzo Finisher	$ 24.70	11.80

CARP1243-003 07/01/2003
North of the 63rd Parallel

	Rates	Fringes
Carpenter/Lather/Drywall		

Applicator	$ 31.40	12.20
Carpenter: Fire or Flood Repair Work	$ 31.99	12.20
Millwright	$ 32.38	12.20

CARP1281-004 07/01/2003
SOUTH OF 63RD PARALLEL

	Rates	Fringes
Acoustical Applicator and Lather	$ 28.10	12.70
Carpenters & Drywallers	$ 28.10	12.70
Millwright	$ 28.80	12.70

CARP2520-003 08/01/2003

	Rates	Fringes
Diver		
Stand-by	$ 32.66	12.20
Tender	$ 31.66	12.20
Working	$ 65.32	12.20
Piledriver		
Carpenter	$ 29.30	12.20
Piledriver; Skiff Operator and Rigger	$ 28.14	12.20
Sheet Pile Stabber	$ 29.14	12.20
Welder	$ 29.90	12.20

ELEC1547-004 11/03/2003

	Rates	Fringes
Cable splicer	$ 33.17	3%+13.10
Electrician;Technician	$ 31.42	3%+13.10

ELEC1547-005 01/01/2004

	Rates	Fringes
Cable splicer	$ 35.90	3%+16.00
Linemen (Including Equipment Operators, Technician)	$ 34.15	3%+16.00
Powderman	$ 32.15	3%+16.00
Tree Trimmer	$ 22.95	3%+16.00

ELEV0019-002 01/01/2004

	Rates	Fringes
Elevator Mechanic	$ 37.695	10.765+a

FOOTNOTE: a. Employer contributes 8% of the basic hourly rate for over 5 year's service and 6% of the basic hourly rate for 6 months to 5 years' of service as vacation paid credit. Seven paid holidays: New Year's Day; Memorial Day; Independence Day; Labor Day, Thanksgiving Day; Friday after Thanksgiving and Christmas Day

---

ENGI0302-002 09/01/2003

	Rates	Fringes
Power equipment operators:		
GROUP 1	$ 32.08	10.89
GROUP 1A	$ 33.62	10.89
GROUP 2	$ 31.41	10.89
GROUP 3	$ 30.78	10.89

GROUP 4.....$ 25.36 10.89

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Asphalt Roller; Back Filler; Barrier Machine (Zipper); Batch Plant Operator: Batch and Mixer over 200 yds.; Beltcrete with power pack and similar conveyors; Bending Machine; Boat Coxwains; Bulldozers; Cableways, Highlines and Cablecars; Cleaning Machine; Coating Machine; Concrete Hydro Blaster; Cranes-45 tons and under or 150 foot boom and under (including jib and attachments): (a) Shovels, Backhoes, Draglines, Clamshells; Gradalls-3 yards and under; (b) Hydralifts or Transporters, all track or truck type,(c) Derricks; Crushers; Deck Winches-Double Drum; Ditching or Trenching Machine (16 inch or over); Drilling Machines, core, cable, rotary and exploration; Finishing Machine Operator, concrete paving, Laser Screed, sidewalk, curb and gutter machine; Helicopters; Hover Craft, Flex Craft, Loadmaster, Air Cushion, All Terrain Vehicle, Rollagon, Bargecable, Nodwell Sno Cat; Hydro Ax: Feller Buncher and similar; Loaders: Forklifts with power boom and swing attachment, Overhead and front end, 2 1/2 yards through 5 yards, Loaders with forks or pipe clamps, Loaders, elevating belt type, Euclid and similar types; Mechanics, Bodyman; Micro Tunneling Machine; Mixers: Mobile type w/hoist combination; Motor Patrol Grader; Mucking Machines: Mole, Tunnel Drill, Horizontal/Directional Drill Operator, and/or Shield; Operator on Dredges; Piledriver Engineers, L. B. Foster, Puller or similar Paving Breaker; Power Plant, Turbine Operator, 200 k.w. and over (power plants or combination of power units over 300 k.w.); Sauerman-Bagley; Scrapers-through 40 yards; Service Oiler/Service Engineer; Sidebooms-under 45 tons; Shot Blast Machine; Spreaders, Blaw Knox, Cedarapids, Barber Greene, Slurry Machine; Sub-grader (Gurries, C.M.I. and C.M.I. Roto Mills and similar types); Tack tractor; Truck mounted Concrete Pumps, Conveyor, Creter; Water Kote Machine; Unlicensed off road hauler

GROUP 1A: Cranes-over 45 tons or 150 foot (including jib and attachments): (a) Shovels, backhoes, draglines, clamshells-over 3 yards, (b) Tower cranes; Loaders over 5 yds.; Motor Patrol Grader (finish: when finishing to final graders and/or to hubs, or for asphalt); Power Plants: 1000 k.w. and over; Quad; Screed; Sidebooms over 45 tons; Slip Form Paver C.M.I. and similar types; Scrapers over 40 yards

GROUP 2: Batch Plant Operators: Batch and Mixer 200 yds. per hour and under; Boiler-fireman; Cement Hog and Concrete Pump Operator; Conveyors (except as listed in group 1); Hoist on steel erection; Towermobiles and Air Tuggers; Horizontal/Directional Drill Locator; Loaders, Elevating Grader, Dumor and similar; Locomotives: rod and geared engines; Mixers; Screening, Washing Plant; Sideboom (cradling rock drill regardless of size); Skidder; Trencing Machine under 16 inches.

GROUP 3: "A" Frame Trucks, Deck Winches: single power drum; Bombardier (tack or tow rig); Boring Machine; Brooms-power; Bump Cutter; Compressor; Farm tractor; Forklift, industrial type; Gin Truck or Winch Truck with poles when used for hoisting; Grade Checker and Stake Hopper; Hoist, Air

Tuggers, Elevators; Loaders: (a) Elevating-Athey, Barber Green and similar types (b) Forklifts or Lumber Carrier (on construction job site) (c) Forklifts with Tower (d) Overhead and Front-end, under 2 1/2 yds. Locomotives:Dinkey (air, steam, gas and electric) Speeders; Mechanics (light duty); Mixers: Concrete Mixers and Batch 200 yds. per hour and under; Oil, Blower Distribution; Post Hole Diggers, mechanical; Pot Fireman (power agitated); Power Plant, Turbine Operator, under 300 k.w.; Pumps-water; Rig oiler/assistant engineer, over 45 ton, over 3 yards or over 150 foot boom; Roller-other than Plantmix; Saws, concrete; Straightening Machine; Tow Tractor

GROUP 4: Rig Oiler/Assistant Engineer (Advances to Group III if over 45 tons or 3 yards or 150 ft. boom); Swamper (on trenching machines or shovel type equipment); Spotter; Steam Cleaner

FOOTNOTE: Groups 1-4 receive 10% premium while performing tunnel or underground work.

IRON0751-003 08/01/2003

	Rates	Fringes
Ironworkers:		
BRIDGE, STRUCTURAL, ORNAMENTAL, REINFORCING MACHINERY MOVER, RIGGER, SHEETER, STAGE RIGGER, BENDER OPERATOR	$ 27.50	14.10
FENCE, BARRIER AND GUARDRAIL INSTALLERS	$ 24.00	13.85
GUARDRAIL LAYOUT MAN	$ 24.74	13.85
HELICOPTER, TOWER	$ 28.50	14.10

LABO0341-005 09/01/2003

	Rates	Fringes
Laborers:		
GROUP 1	$ 24.49	11.50
GROUP 2	$ 25.24	11.50
GROUP 3	$ 25.89	11.50
GROUP 3A	$ 28.29	11.50
GROUP 4	$ 16.84	11.50
TUNNELS, SHAFTS, AND RAISES		
GROUP 1	$ 26.94	11.50
GROUP 2	$ 27.76	11.50
GROUP 3	$ 28.48	11.50
GROUP 3A	$ 31.12	11.50

LABORERS CLASSIFICATIONS

GROUP 1: Asphalt Workers (shovelman, plant crew); Brush Cutters; Camp Maintenance Laborer; Carpenter Tenders; Choke Setters, Hook Tender, Rigger, Signalman; Concrete Laborer(curb and gutter, chute handler, grouting, curing, screeding); Crusher Plant Laborer; Demolition Laborer; Ditch Diggers; Dump Man; Environmental Laborer (asbestos (limited to nonmechanical systems), hazardous and toxic waste, oil spill); Fence Installer; Fire Watch Laborer; Flagman; Form Strippers; General Laborer; Guardrail Laborer, Bridge Rail Installers; Hydro-Seeder Nozzleman; Laborers (building); Landscape or Planter; Material

Handlers; Pneumatic or Power Tools; Portable or Chemical Toilet Serviceman; Pump Man or Mixer Man; Railroad Track Laborer; Sandblast, Pot Tender; Saw Tenders; Scaffold Building and Erecting; Slurry Work; Stake Hopper; Steam Point or Water Jet Operator; Steam Cleaner Operator; Tank Cleaning; Utiliwalk and Utilidor Laborer; Watchman (construction projects); Window Cleaner

GROUP 2: Burning and Cutting Torch; Cement or Lime Dumper or Handler (sack or bulk); Choker Splicer; Chucktender (wagon, airtrack and hydraulic drills); Concrete Laborers (power buggy, concrete saws, pumpcrete nozzleman, vibratorman); Environmental Laborer (marine work); Foam Gun or Foam Machine Operator; Green Cutter (dam work); Guardrail Machine Operator; Gunnite Operator; Hod Carriers; Jackhammer or Pavement Breakers (more than 45 pounds); Mason Tender and Mud Mixer (sewer work); Plasterer, Bricklayer and Cement Finisher Tenders; Power Saw Operator; Railroad Switch Layout Laborer; Sandblaster; Sewer Caulkers; Sewer Plant Maintenance Man; Thermal Plastic Applicator; Timber Faller, chain saw operator, filer; Timberman

GROUP 3: Bit Grinder; Drill Doctor (in the field); Drillers (including, but not limited to, wagon drills, air track drills; hydraulic drills); High Rigger and tree topper; Higher Scaler; Pioneer Drilling and Drilling Off Tugger (all type drills); Powderman; Slurry Seal Squeegee Man

GROUP 3A: Asphalt Raker, Asphalt Belly dump lay down; Grade checker (setting or transfering of grade marks, line and grade); Pipelayers

GROUP 4: Final Building Cleanup

TUNNELS, SHAFTS, AND RAISES CLASSIFICATIONS

GROUP 1: Brakeman; Muckers; Nippers; Topman and Bull Gang; Tunnel Track Laborer

GROUP 2: Burning and Cutting Torch; Concrete Laborers; Jackhammers; Laser Instrument Operators; Nozzleman, Pumpcrete or Shotcrete; Pipelayers.

GROUP 3: Miner; Miner; Retimberman

GROUP 3A: Powderman

Tunnel shaft and raise rates only apply to workers regularly employed inside a tunnel portal or shaft collar.

PAIN1140-004 04/01/2004

SOUTH OF THE 63RD PARALLEL

	Rates	Fringes
Painters:		
Brush, Roller, Sign, Paper and Vinyl, Swing Stage, Hand Taper/Drywall, Structural Steel, and Commercial Spray	$ 23.79	12.89
Machine Taper/Drywall	$ 23.99	12.89
Spray-Sand/Blast, Epoxy and Tar Applicator	$ 24.59	12.89
Steeple Jack & Tower	$ 25.59	12.89

PAIN1140-005 09/01/2003

	Rates	Fringes

```
  Soft Floor Layer...............$ 25.40            8.87
-----------------------------------------------------------------
* PAIN1140-006 06/01/2004
SOUTH OF THE 63RD PARALLEL
                                  Rates          Fringes
  Glazier........................$ 27.00           12.60
-----------------------------------------------------------------
PAIN1555-004 04/01/2004
NORTH OF THE 63RD PARALLEL
                                  Rates          Fringes
  Hazardous Material Applicator
     LEAD BASED PAINT
     ABATEMENT, RADON
     MITIGATION, SANDBLAST,
     STRUCTURAL STEEL, TAPING,
     TEXTURING...................$ 28.50           12.47
  Painter
     BRUSH, BUFFER OPERATOR,
     FLOOR-COVERER, POT TENDER,
     ROLL SPRAY, WALLCOVERER.....$ 28.00           12.47
-----------------------------------------------------------------
* PAIN1555-005 06/01/2004
NORTH OF THE 63RD PARALLEL
                                  Rates          Fringes
  Glazier........................$ 27.60           12.07
-----------------------------------------------------------------
PLAS0867-001 04/01/2004
                                  Rates          Fringes
  Plasterer
     NORTH OF THE 63RD PARALLEL..$ 30.39           11.51
     SOUTH OF THE 63RD PARALLEL..$ 30.14           11.51
-----------------------------------------------------------------
PLAS0867-003 04/01/2003
                                  Rates          Fringes
  Cement Mason
     NORTH OF THE 63RD PARALLEL..$ 29.54           11.51
     SOUTH OF THE 63RD PARALLEL..$ 29.29           11.51
-----------------------------------------------------------------
PLUM0262-002 07/01/2003
East of the 141st Meridian
                                  Rates          Fringes
  Plumber; Steamfitter...........$ 29.09           10.55
-----------------------------------------------------------------
PLUM0367-002 07/20/2003
South of the 63rd Parallel
                                  Rates          Fringes
  Plumber; Steamfitter...........$ 30.80           12.50
-----------------------------------------------------------------
PLUM0375-002 07/01/2003
North of the 63rd Parallel
                                  Rates          Fringes
  Plumber; Steamfitter...........$ 34.26           13.15
-----------------------------------------------------------------
PLUM0669-002 04/01/2004
                                  Rates          Fringes
  Sprinkler Fitter...............$ 37.85            8.65
-----------------------------------------------------------------
```

ROOF0190-002 09/01/2003

	Rates	Fringes
Roofer		
North of the 63rd Parallel..	$ 30.20	10.92
South of the 63rd Parallel..	$ 28.20	10.92

SHEE0023-003 07/01/2003
South of the 63rd Parallel

	Rates	Fringes
Sheet Metal Worker.....	$ 30.80	12.44

SHEE0023-004 09/01/2003
North of the 63rd Parallel

	Rates	Fringes
Sheet Metal Worker.....	$ 33.36	12.89

TEAM0959-003 09/01/2003

	Rates	Fringes
Truck Driver		
GROUP 1.....	$ 32.10	10.07
GROUP 1A.....	$ 33.15	10.07
GROUP 2.....	$ 31.05	10.07
GROUP 3.....	$ 30.37	10.07
GROUP 4.....	$ 29.90	10.07
GROUP 5.....	$ 29.26	10.07

GROUP 1: Semi with Double Box Mixer; Dump Trucks (including rockbuggy and trucks with pups) over 40 yards up to and including 60 yards; Deltas, Commanders, Rollogans and similar equipment when pulling sleds, trailers or similar equipment; Boat Coxswain; Lowboys including attached trailers and jeeps, up to and including 12 axles; Ready-mix over 12 yards up to and including 15 yards)

GROUP 1A: Dump Trucks (including Rockbuggy and Trucks with pups) over 60 yards up to and including 100 yards

GROUP 2: Turn-O-Wagon or DW-10 not self-loading; All Deltas, Commanders, Rollogans, and similar equipment; Mechanics; Tireman, heavy duty; Dump Trucks (including Rockbuggy and Trucks with pups) over 20 yards up to and including 40 yards; Lowboys including attached trailers and jeeps up to and including 8 axles; Super vac truck/cacasco truck/heat stress truck; Ready-mix over 7 yards up to and including 12 yards

GROUP 3: Dump Trucks (including Rockbuggy and Trucks with pups) over 10 yards up to and including 20 yards; batch trucks 8 yards and up; Oil distributor drivers; Greaser;Water Wagon (when pulled by Euclid or similar type equipment);Partsman

GROUP 4: Buggymobile; Semi or Truck and trailer; Dumpster; Tireman (light duty); Dump Trucks (including Rockbuggy and Truck with pups) up to and including 10 yards; Track Truck Equipment; Stringing Truck; Fuel Truck; Fuel Handler with truck; Grease Truck; Flat Beds, dual rear axle; Hyster Operators (handling bulk aggregate); Lumber Carrier; Water Wagon, semi; Water Wagon, dual axle; Gin Pole Truck, Winch Truck, Wrecker, Truck Mounted "A" Frame manufactured rating over 5 tons; Bull Lifts and Fork Lifts with Power Boom and Swing attachments, over 5 tons; Front End Loader with

Forks; Bus Operator over 30 passengers; All Terrain Vehicles; Boom Truck/Knuckle Truck over 5 tons; Foam Distributor Truck/dual axle; Hydro-seeders, dual axle; Vacuum Trucks, Truck Vacuum Sweepers; Vacuum Trucks, Truck Vacuum Sweepers; Loadmaster (air and water); Air Cushion or similar type vehicle; Fire Truck; Combination Truck-fuel and grease; Compactor (when pulled by rubber tired equipment); Rigger (air/water/oilfield); Ready Mix, up to and including 7 yards

GROUP 5: Gravel Spreader Box Operator on Truck; Flat Beds, single rear axle; Boom Truck/Knuckle Truck up to and including 5 tons; Pickups (Pilot Cars and all light duty vehicles); Water Wagon, single axle; Gin Pole Truck, Winch Truck, Wrecker, Truck Mounted "A" Frame, manufactured rating 5 tons and under; Bull Lifts and Fork Lifts (fork lifts with power broom and swing attachments up to and including 5 tons); Buffer Truck; Tack Truck; Bus Operators (up to 30 passengers); Farm type Rubber Tired Tractor (when material handling or pulling wagons on a construction project); Foam Distributor, single axle; Hydro-Seeders, single axle; Team Drivers (horses, mules and similar equipment); Rigger (warehouse operation); Fuel Handler (station/bulk attendant); Batch Truck, up to and including 7 yards

---

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

==========

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

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

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

==========

END OF GENERAL DECISION

SECTION 00800

SPECIAL CONTRACT REQUIREMENTS

W911KB-04-B-0008
OAK AVE./NEELY ROAD
UTILITIES UPGRADE
FT WAINWRIGHT, ALASKA

I-N-D-E-X

CLAUSE	TITLE		PAGE
SCR-1	COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK	SEE SECTION 00700	00800-1
SCR-2	EXCLUSION OF PERIODS IN COMPUTING COMPLETION SCHEDULES	NOT USED	00800-1
SCR-3	LIQUIDATED DAMAGES-CONSTRUCTION	SEE SECTION 00700	00800-1
SCR-4	TIME EXTENSION	SEE SECTION 00700	00800-1
SCR-5	CONTRACT DRAWINGS AND SPECIFICATIONS		00800-1
SCR-6	BRAND NAME OR EQUAL	SEE SECTION 00700	00800-13
SCR-7	CERTIFICATES OF COMPLIANCE		00800-13
SCR-8	SUBMITTALS		00800-14
SCR-9	IDENTIFICATION OF GOVERNMENT-FURNISHED PROPERTY	SEE SECTION 00700	00800-14
SCR-10	PHYSICAL DATA		00800-14
SCR-11	AVAILABILITY AND USE OF UTILITY SERVICE	SEE SECTION 00700	00800-15
SCR-12	IDENTIFICATION OF EMPLOYEES AND MILITARY REGULATIONS		00800-15
SCR-13	INSURANCE – WORK ON A GOVERNMENT INSTALLATION	SEE SECTION 00700	00800-15
SCR-14	SPECIAL SAFETY REQUIREMENTS	NOT USED	00800-15
SCR-15	AIRFIELD SAFETY PRECAUTIONS	SEE SECTION 00700	00800-15
SCR-16	LAYOUT OF WORK	SEE SECTION 00700	00800-15
SCR-17	QUANTITY SURVEY	SEE SECTION 00700	00800-15
SCR-18	AGGREGATE SOURCES	NOT USED	00800-15
SCR-19	HAUL ROADS	NOT USED	00800-15
SCR-20	RESERVED	NOT USED	00800-15
SCR-21	PERFORMANCE OF WORK BY THE CONTRACTOR	SEE SECTION 00700	00800-15
SCR-22	SALVAGE MATERIALS AND EQUIPMENT		00800-15
SCR-23	OBSTRUCTION OF NAVIGABLE WATERWAYS	SEE SECTION 00700	00800-15
SCR-24	SIGNAL LIGHTS	NOT USED	00800-16
SCR-25	COMMUNICATION SECURITY		00800-16

SCR-26	PERMITS AND RESPONSIBILITIES	SEE SECTION 00700	00800-16
SCR-27	SUPERINTENDENCE OF SUBCONTRACTORS	NOT USED	00800-16
SCR-28	PAYMENT FOR MOBILIZATION AND DEMOBILIZATION	SEE SECTION 00700	00800-16
SCR-29	EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE	SEE SECTION 00700	00800-16
SCR-30	OPTION FOR INCREASED QUALITY		00800-16
SCR-31	WORK IN QUARANTINED AREA	NOT USED	00800-16
SCR-32	PRESERVATION OF HISTORICAL, ARCHEOLOGICAL AND CULTURAL RESOURCES	NOT USED	00800-16
SCR-33	PAYMENT FOR MATERIALS DELIVERED OFF-SITE	SEE SECTION 00700	00800-16
SCR-34	RESERVED	NOT USED	00800-16
SCR-35	RESERVED	NOT USED	00800-16
SCR-36	TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER		00800-16
SCR-37	NONDOMESTIC CONSTRUCTION MATERIALS	SEE SECTION 00700	00800-17
SCR-38	YEAR 2000 COMPLIANCE		00800-17
SCR-39	RESERVED	NOT USED	00800-17
SCR-40	KEY PERSONNEL	NOT USED	00800-17
SCR-41	DESIGN-BUILD CONTRACT - ORDER OF PRECEDENCE	NOT USED	00800-17
SCR-42	PROPOSED BETTERMENTS	NOT USED	00800-17
SCR-43	SEQUENCE OF DESIGN-CONSTRUCTION	NOT USED	00800-17
SCR-44	RESPONSIBILITY OF THE CONTRACTOR FOR DESIGN	NOT USED	00800-17
SCR-45	SAFETY AND HEALTH REQUIREMENTS MANUAL, EM 385-1-1, U.S. ARMY CORPS OF ENGINEERS		00800-17
SCR-46 THRU SCR-111		NOT USED	00800-18
SCR-112 SEE SECTION 00700		NOT USED	00800-18

ATTACHMENT: CLIMATOLOGICAL SUMMARY

-- End of Special Contract Requirements Index --

SECTION 00800
SPECIAL CONTRACT REQUIREMENTS

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

SEE SECTION 00700

SCR-2 EXCLUSION OF PERIODS IN COMPUTING COMPLETION SCHEDULES (JAN 1965):

NOT USED

SCR-3 LIQUIDATED DAMAGES-CONSTRUCTION (SEP 2000) (FAR 52.211-12):

See Section 00700

SCR-4 TIME EXTENSIONS (APR 1984) (FAR 52.212-6):

SEE SECTION 00700

SCR-5 CONTRACT DRAWINGS AND SPECIFICATIONS (Aug 2000) (DFARS 252.236-7001):

(a) thru (d). See SECTION 00700

(e) The work shall conform to the specifications and the contract drawings identified on the following index of drawings:

Drawing No.	Sheet No.	Title	Rev. No.	Date
		GENERAL		
NONE	G1	COVER SHEET	NONE	
"	G2	SCHEDULE OF DRAWINGS 1	"	"
"	G3	SCHEDULE OF DRAWINGS 2	"	"
"	G4	SCHEDULE OF DRAWINGS 3	"	"
F16-06-4322	LV1	LOCATION & VICINITY MAP	"	"
		CIVIL		
F-893-40-01	C1.01	GENERAL NOTES 1	"	"
"	C1.02	GENERAL NOTES 2	"	"
"	C2.01	OVERALL SITE PLAN	"	"
"	C2.02	PLAN AND PROFILE MHS H4-3-7 TO H4-2-6	"	"
"	C2.03	PLAN AND PROFILE MHS H4-8-2 TO H4-9-1	"	"

Drawing No.	Sheet No.	Title	Rev. No.	Date
F-893-40-01	C2.04	PLAN AND PROFILE MHS H4-9-1 TO H5-7-1	NONE	"
"	C2.05	PLAN AND PROFILE MHS H5-7-2 TO H5-7-3	"	"
"	C2.06	PLAN AND PROFILE MHS H4-5-2 TO H4-6-4	"	"
"	C2.07	PLAN AND PROFILE MHS H4-6-4 TO H5-4-3	"	"
"	C2.08	NOT USED	"	"
"	C2.09	NOT USED	"	"
"	C2.10	NOT USED	"	"
"	C2.11	NOT USED	"	"
"	C2.12	NOT USED	"	"
"	C2.13	NOT USED	"	"
"	C2.14	SITE PLAN BUILDINGS 3706 TO 3708	"	"
"	C2.15	PROFILES BUILD 3706 TO 3708	"	"
"	C2.16	EXTERIOR SITE PHOTOS SEPTEMBER 2003	"	"
"	C3.01.1	MANHOLE H4-3-7 UPPER PLANS & SECTIONS	"	"
"	C3.01.2	MANHOLE H4-3-7 UPPER MIDDLE PLANS & SECTIONS	"	"
"	C3.01.3	MANHOLE H4-3-7 LOWER MIDDLE PLANS & SECTIONS	"	"
"	C3.01.4	MANHOLE H4-3-7 SECTIONS	"	"
"	C3.02.1	MANHOLE H4-2-11 PLANS	"	"
"	C3.02.2	MANHOLE H4-2-11 SECTIONS 1	"	"
"	C3.02.3	MANHOLE H4-2-11 SECTIONS 2	"	"
"	C3.03.1	MANHOLE H4-2-10 PLANS	"	"
"	C3.03.2	MANHOLE H4-2-10 SECTIONS	"	"

Drawing No.	Sheet No.	Title	Rev. No.	Date
F-893-40-01	C3.04.1	MANHOLE H4-2-2 PLANS AND SECTIONS 1	NONE	"
"	C3.04.2	MANHOLE H4-2-2 PLANS AND SECTIONS 2	"	"
"	C3.04.3	MANHOLE H4-2-2 SECTIONS	"	"
"	C3.04.4	MANHOLE H4-2-2 STORM PLANS AND SECTIONS	"	"
"	C3.05.1	MANHOLE H4-2-6 PLANS AND SECTIONS 1	"	"
"	C3.05.2	MANHOLE H4-2-6 PLANS AND SECTIONS 2	"	"
"	C3.05.3	MANHOLE H4-2-6 SECTIONS 1	"	"
"	C3.05.4	MANHOLE H4-2-6 SECTIONS 2	"	"
"	C3.05.5	MANHOLE H4-2-6 SECTIONS 3	"	"
"	C3.06.1	MANHOLE H4-8-2 PLANS 1	"	"
"	C3.06.2	MANHOLE H4-8-2 PLANS 2	"	"
"	C3.06.3	MANHOLE H4-8-2 SECTIONS 1	"	"
"	C3.06.4	MANHOLE H4-8-2 SECTIONS 2	"	"
"	C3.07.1	MANHOLE H4-8-3 PLANS	"	"
"	C3.07.2	MANHOLE H4-8-3 SECTIONS 1	"	"
"	C3.07.3	MANHOLE H4-8-3 SECTIONS 2	"	"
"	C3.08.1	MANHOLE H4-8-4 PLANS	"	"
"	C3.08.2	MANHOLE H4-8-4 SECTIONS	"	"
"	C3.09.1	MANHOLE H4-8-5 PLANS 2	"	"
"	C3.09.2	MANHOLE H4-8-5 SECTIONS	"	"
"	C3.10.1	MANHOLE H4-9-1 PLANS	"	"

Drawing No.	Sheet No.	Title	Rev. No.	Date
F-893-40-01	C3.10.2	MANHOLE H4-9-1 SECTIONS 1	NONE	"
"	C3.10.3	MANHOLE H4-9-1 SECTIONS 2 (C-38)	"	"
"	C3.11.1	MANHOLE H4-9-2 PLANS	"	"
"	C3.11.2	MANHOLE H4-9-2 SECTIONS	"	"
"	C3.12.1	MANHOLE H4-9-3 PLANS	"	"
"	C3.12.2	MANHOLE H4-9-4 SECTIONS 2	"	"
"	C3.13.1	MANHOLE H4-5-7 PLANS	"	"
"	C3.13.2	MANHOLE H5-7-1 PLANS	"	"
"	C3.14.1	MANHOLE H5-7-2 PLANS AND PLANS	"	"
"	C3.14.2	MANHOLE H5-7-2 SECTIONS SECTIONS	"	"
"	C3.15.1	MANHOLE H5-7-3 PLANS AND PLANS 1	"	"
"	C3.15.2	MANHOLE H5-7-3 PLANS AND PLANS 2	"	"
"	C3.15.3	MANHOLE H5-7-3 PLANS AND SECTIONS 1	"	"
"	C3.15.4	MANHOLE H5-7-3 PLANS AND SECTIONS 2	"	"
"	C3.16.1	MANHOLE H4-5-2 PLANS 1	"	"
"	C3.16.2	MANHOLE H4-5-2 PLANS 2	"	"
"	C3.16.3	MANHOLE H4-5-2 PLANS 1	"	"
"	C3.16.4	MANHOLE H4-5-2 SECTIONS 1	"	"
"	C3.17.1	MANHOLE H4-5-1L PLANS AND SECTIONS	"	"
"	C3.17.2	MANHOLE H4-5-1L SECTIONS	"	"
"	C3.18.1	MANHOLE H4-5-3 PLANS	"	"
"	C3.18.2	MANHOLE H4-5-3 SECTIONS 1 (C-21)	"	"

Drawing No.	Sheet No.	Title	Rev. No.	Date
F-893-40-01	C3.18.3	MANHOLE H4-5-3 SECTIONS 2	NONE	"
"	C3.19.1	MANHOLE H4-5-4 PLANS AND SECTIONS	"	"
"	C3.19.2	BUILDING 3726 PLANS AND SECTIONS	"	"
"	C3.20.1	MANHOLE H4-6-1 PLANS AND SECTIONS 1	"	"
"	C3.20.2	MANHOLE H4-6-1 PLANS AND SECTIONS 2	"	"
"	C3.20.3	MANHOLE H4-6-1 PLANS AND SECTIONS 3	"	"
"	C3.20.4	MANHOLE H4-6-1 SECTIONS	"	"
"	C3.20.5	MANHOLE H4-6-2 PLANS AND SECTIONS 4		
"	C3.21.1	MANHOLE H4-6-2 PLANS AND SECTIONS 1	"	"
"	C3.21.2	MANHOLE H4-6-2 PLANS AND SECTIONS 2	"	"
"	C3.21.3	MANHOLE H4-6-2 PLANS AND SECTIONS 3	"	"
"	C3.21.4	MANHOLE H4-6-2 PLANS AND SECTIONS 4	"	"
"	C3.21.5	MANHOLE H4-6-2 SECTIONS 1		
"	C3.21.6	MANHOLE H4-6-2 SECTIONS 2		
"	C3.22.01	NOT USED	"	"
"	C3.22.02	NOT USED	"	"
"	C3.22.03	NOT USED	"	"
"	C3.22.04	NOT USED	"	"
"	C3.22.05	NOT USED	"	"
"	C3.22.06	NOT USED	"	"
"	C3.22.07	NOT USED	"	"

Drawing No.	Sheet No.	Title	Rev. No.	Date
F-893-40-01	C3.22.08	NOT USED	NONE	"
"	C3.22.09	NOT USED	"	"
"	C3.22.10	NOT USED	"	"
"	C3.22.11	NOT USED	"	"
"	C3.22.12	NOT USED	"	"
"	C3.22.13	NOT USED	"	"
"	C3.22.14	NOT USED	"	"
"	C3.22.15	NOT USED	"	"
"	C3.22.16	NOT USED	"	"
"	C3.22.17	NOT USED	"	"
"	C3.22.18	NOT USED	"	"
"	C3.23.1	MANHOLE H4-6-3 PLANS 1	"	"
"	C3.23.2	MANHOLE H4-6-3 PLANS 2	"	"
"	C3.23.3	MANHOLE H4-6-3 SECTIONS 1	"	"
"	C3.23.4	MANHOLE H4-6-3 SECTIONS 2	"	"
"	C3.24.1	MANHOLE H4-6-4 PLANS 1	"	"
"	C3.24.2	MANHOLE H4-6-4 PLANS 2	"	"
"	C3.24.3	MANHOLE H4-6-4 PLANS 3	"	"
"	C3.24.4	MANHOLE H4-6-4 SECTIONS		
"	C3.25.1	MANHOLE H4-6-5 PLANS & SECTIONS 1	"	"
"	C3.25.2	MANHOLE H4-6-5 PLANS & SECTIONS 2	"	"
"	C3.25.3	MANHOLE H4-6-5 PLANS & SECTIONS 3	"	"
"	C3.25.4	MANHOLE H4-6-5 PLANS & SECTIONS 4	"	"
"	C3.25.5	MANHOLE H4-6-5 SECTIONS 1	"	"

Drawing No.	Sheet No.	Title	Rev. No.	Date
F-893-40-01	C3.25.6	MANHOLE H4-6-5	NONE	"
"	C3.26.01	NOT USED	"	"
"	C3.26.02	NOT USED	"	"
"	C3.26.03	NOT USED	"	"
"	C3.26.04	NOT USED	"	"
"	C3.26.05	NOT USED	"	"
"	C3.26.06	NOT USED	"	"
"	C3.26.07	NOT USED	"	"
"	C3.26.08	NOT USED	"	"
"	C3.26.09	NOT USED	"	"
"	C3.26.10	NOT USED	"	"
"	C3.26.11	NOT USED	"	"
"	C3.26.12	NOT USED	"	"
"	C3.26.13	NOT USED	"	"
"	C3.26.14	NOT USED	"	"
"	C3.26.15	NOT USED	"	"
"	C3.26.16	NOT USED	"	"
"	C3.26.17	NOT USED	"	"
"	C3.26.18	NOT USED	"	"
"	C3.27.1	MANHOLE H5-4-1 PLANS AND SECTIONS 1	"	"
"	C3.27.2	MANHOLE H5-4-1 PLANS AND SECTIONS 2	"	"
"	C3.27.3	MANHOLE H5-4-1 PLANS AND SECTIONS 3	"	"
"	C3.27.4	MANHOLE H5-4-1 SECTIONS	"	"
"	C3.28.1	MANHOLE H5-4-5 PLANS AND SECTIONS 1	"	"
"	C3.28.2	MANHOLE H5-4-5 PLANS AND SECTIONS 2	"	"

Drawing No.	Sheet No.	Title	Rev. No.	Date
F-893-40-01	C3.28.3	MANHOLE H5-4-5 PLANS AND SECTIONS 3	NONE	"
"	C3.28.4	MANHOLE H5-4-5 SECTIONS	"	"
"	C3.29.01	BUILDING 3707, AREA N EXISTING PLANS AND SECTIONS	"	"
"	C3.29.02	BUILDING 3707, AREA NW EXISITING PLANS AND SECTIONS	"	"
"	C3.29.03	BUILDING 3707, AREA W & S EXISTING PLANS AND SECTIONS	"	"
"	C3.29.04	BUILDING 3707, AREA SW EXISTING PLANS AND SECTIONS	"	"
"	C3.29.05	BUILDING 3707, AREA SE EXISTING PLANS AND SECTIONS	"	"
"	C3.29.06	BUILDING 3708, EXISTING PLANS AND SECTIONS	"	"
"	C3.29.07	BUILDING 3706, EXISTING PLANS AND SECTIONS	"	"
"	C3.29.08	BUILDING 3707, AREA N NEW PLANS AND SECTIONS	"	"
"	C3.29.09	BUILDING 3707, AREA NW NEW PLANS AND SECTIONS	"	"
"	C3.29.10	BUILDING 3707, AREA W & S NEW PLANS AND SECTIONS	"	"
"	C3.29.11	BUILDING 3707, AREA SW NEW PLANS AND SECTIONS MANHOLE H5-4-6	"	"
"	C3.29.12	BUILDING 3707, AREA SW NEW SECTIONS MANHOLE H5-4-6	"	"
"	C3.29.13	BUILDING 3707, AREA SE NEW PLANS AND SECTIONS	"	"
"	C3.29.14	BUILDING 3708, NEW PLANS AND SECTIONS	"	"

Drawing No.	Sheet No.	Title	Rev. No.	Date
F-893-40-01	C3.29.15	BUILDING 3706, NEW PLANS AND SECTIONS	NONE	"
"	C3.30.1	MANHOLE H5-4-2 PLANS AND SECTIONS 1	"	"
"	C3.30.2	MANHOLE H5-4-2 PLANS AND SECTIONS 2	"	"
"	C3.30.3	MANHOLE H5-4-2 PLANS AND SECTIONS 3	"	"
"	C3.30.4	MANHOLE H5-4-2 PLANS AND SECTIONS 4	"	"
"	C3.30.5	MANHOLE H5-4-2 SECTIONS	"	"
"	C3.30.6	MANHOLE H5-4-2 OPTION PLANS	"	"
"	C3.31.01	NOT USED	"	"
"	C3.31.02	NOT USED	"	"
"	C3.31.03	NOT USED	"	"
"	C3.31.04	NOT USED	"	"
"	C3.31.05	NOT USED	"	"
"	C3.31.06	NOT USED	"	"
"	C3.31.07	NOT USED	"	"
"	C3.31.08	NOT USED	"	"
"	C3.31.09	NOT USED	"	"
"	C3.31.10	NOT USED	"	"
"	C3.31.11	NOT USED	"	"
"	C3.31.12	NOT USED	"	"
"	C3.31.13	NOT USED	"	"
"	C3.31.14	NOT USED	"	"
"	C3.31.15	NOT USED	"	"
"	C3.31.16	NOT USED	"	"
"	C3.32.1	MANHOLE H5-4-3 PLANS AND SECTIONS 1	"	"

Drawing No.	Sheet No.	Title	Rev No.	Date
F-893-40-01	C3.32.2	MANHOLE H5-4-3 PLANS AND SECTIONS 2	NONE	"
"	C3.32.3	MANHOLE H5-4-3 PLANS AND SECTIONS 3	"	"
"	C3.32.4	MANHOLE H5-4-3 PLANS AND SECTIONS 4	"	"
"	C3.32.5	MANHOLE H5-4-3 SECTIONS 1	"	"
"	C3.32.6	MANHOLE H5-4-3 SECTIONS 2	"	"
"	C4.01	DETAILS 1	"	"
"	C4.02	DETAILS 2	"	"
"	C4.03	DETAILS 3	"	"
"	C4.04	DETAILS 4	"	"
"	C4.05	UTILIDOR VENT DETAILS	"	"
"	C4.06	UTILIDOR LAYOUT SECTIONS	"	"
"	C4.07	UTILIDOR SECTIONS AND DETAILS	"	"
"	C4.08	UTILIDOR LAYOUT SECTIONS	"	"
"	C4.09	FIRE HYDRANT PLANS	"	"
"	C4.10	FIRE HYDRANT DETAILS 1	"	"
"	C4.11	FIRE HYDRANT DETAILS 2	"	"
"	C4.12	STEAM AND CONDENSATE EXPANSION JOINT SCHEDULE 1	"	"
"	C4.13	STEAM AND CONDENSATE EXPANSION JOINT SCHEDULE 2	"	"
"	C4.14	STEAM AND CONDENSATE EXPANSION JOINT SCHEDULE 3	"	"
"	C4.15	STEAM AND CONDENSATE SCHEMATIC DIAGRAMS 1	"	"
"	C4.16	STEAM AND CONDENSATE SCHEMATIC DIAGRAMS 2	"	"

Drawing No.	Sheet No.	Title	Rev. No.	Date
F-893-40-01	C4.17	STEAM AND CONDENSATE SCHEMATIC DIAGRAMS 3	NONE	"
"	C4.18	NOT USED	"	"
	C4.19	NOT USED	"	"
"	C4.20	NOT USED	"	"
"	C4.21	STEAM AND CONDENSATE SCHEMATIC DIAGRAMS 7	"	"
"	C4.22	DETAILS 5	"	"
"	C4.23	DETAILS 6	"	"
"	C4.24	DETAILS 7	"	"
		STRUCTURAL		
"	S1.01	MANHOLE ACCESS & TEMPORARY WALL SECTIONS AND DETAILS	"	"
"	S1.02	FIRE HYDRANT MANHOLE LID REMOVABLE UTILIDOR LID & DETAILS	"	"
"	S1.03	EXISTING MANHOLE H4-2-6 PLAN & SECTIONS	"	"
"	S1.04	NEW MANHOLE H4-2-6 PLAN & SECTIONS	"	"
"	S1.05	EXISTING MANHOLE H4-2-2 PLAN & SECTIONS	"	"
"	S1.06	MODIFIED MANHOLE H4-2-2 PLAN & SECTIONS	"	"
"	S1.07	EXISTING MANHOLE H4-2-10 PLAN AND SECTIONS	"	"
"	S1.08	MODIFIED MANHOLE H4-2-10 PLAN & SECTIONS	"	"
"	S1.09	EXISITING MANHOLE H4-2-11 PLAN & SECTIONS	"	"
"	S1.10	NEW MANHOLE H4-2-11 PLAN & SECTIONS	"	"
"	S1.11	NEW UTILIDOR CONNECTION MANHOLE H4-8-3 PLAN & SECTIONS	"	"

Drawing No.	Sheet No.	Title	Rev. No.	Date
F-893-40-01	S1.12	NEW UTILIDOR CONNECTION MANHOLE H4-8-4, H4-8-5 PLAN & SECTIONS	NONE	"
"	S1.13	NEW UTILIDOR CONNECTION MANHOLE H4-9-1 PLAN & SECTIONS	"	"
"	S1.14	NEW UTILIDOR CONNECTION MANHOLE H4-9-2	"	"
"	S1.15	MANHOLE H4-2-6 REINFORCEMENT	"	"
"	S1.16	MANHOLE H4-2-11 REINFORCEMENT	"	"
"	S1.17	UTILIDOR SECTIONS REINFORCEMENT	"	"
"	S1.18	MANHOLE/UTILIDOR, PLAN & SECTIONS REINFORCEMENT I	"	"
"	S1.19	MANHOLE/UTILIDOR, SECTIONS & DETAILS REINFORCEMENT II	"	"
"	S1.20	MISCELLANEOUS -- PROJECT DETAILS TYPICAL SECTIONS & DETAILS	"	"
"	S1.21	MISCELLANEOUS - PROJECT DETAILS TYPICAL SECTIONS & DETAILS II	"	"
"	S2.01	GENERAL NOTES & ABBREVIATIONS	"	"
"	S2.02	UTILIDOR DETAILS 1	"	"
"	S2.03	MANHOLE DETAILS 1	"	"
"	S2.04	MANHOLE DETAILS 2	"	"
"	S2.05	MANHOLE DETAILS 3	"	"
"	S2.06	MANHOLE DETAILS 4	"	"
"	S2.07	FIRE HYDRANT MANHOLE	"	"
		ELECTRICAL		
"	E1.01	ELECTRICAL SITE PLAN 4	"	"
"	E1.02	ELECTRICAL SITE PLAN 5	"	"

Drawing No.	Sheet No.	Title	Rev. No.	Date
F-893-40-01	E1.03	ELECTRICAL SITE PLAN 6	NONE	"
"	E1.04	UTILIDOR POWER, LIGHTS & ALARM	"	"
"	E1.05	PANEL SCHEDULES 2	"	"
"	E1.06	POLE, TRANSFORMER & ALARM SCHEDULE	"	"
"	E1.07	ELECTRICAL DETAILS 3	"	"
"	E2.01	LEGEND	"	"
"	E2.02	ELECTRICAL SITE PLAN 1	"	"
"	E2.03	ELECTRICAL SITE PLAN 2	"	"
"	E2.04	ELECTRICAL SITE PLAN 3	"	"
"	E2.05	ELECTRICAL DETAILS 1	"	"
"	E2.06	ELECTRICAL DETAILS 2	"	"
"	E2.07	ONE LINE DIAGRAM	"	"
"	E2.08	PANELS SCHEDULES	"	"
"	E2.09	UNDERGROUND COM	"	"
		EXHIBITS		
"	EX-1	UNDERGROUND COM-1	"	"
"	EX-2	UNDERGROUND COM-2	"	"
"	EX-3	UNDERGROUND COM-3	"	"

SCR-6 BRAND NAME OR EQUAL (Aug 1999) (FAR 52.211-6)**:**

SEE SECTION 00700

SCR-7 CERTIFICATES OF COMPLIANCE:

Any certificates required for demonstrating proof of compliance of materials with specification requirements shall be executed in 3 copies. Each certificate shall be signed by an official authorized to certify in behalf of the manufacturing company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfactory material, if, after tests are

performed on selected samples, the material is found not to meet the specific requirements.

SCR-8 SUBMITTALS (ER 415-1-10, 30 May 1995):

Within 30 days after receipt of Notice to Proceed, the Contractor shall complete and submit to the Contracting Officer, in triplicate, submittal register ENG Form 4288 listing all submittals and dates. In addition to those items listed on ENG Form 4288, the Contractor shall furnish submittals for any deviation from the plans or specifications. The scheduled need dates must be recorded on the document for each item for control purposes. In preparing the document, adequate time (minimum of 30 days) shall be allowed for review and, only when stipulated, approval and possible resubmittal. Scheduling shall be coordinated with the approved progress schedule. The Contractor’s Quality Control representative shall review the listing at least every 30 days and take appropriate action to maintain an effective system. Copies of updated or corrected listing shall be submitted to the Contracting Officer at least every 60 days in the quantity specified. Payment will not be made for any material or equipment which does not comply with contract requirements.

Section 01330 includes an ENG Form 4288 listing technical items the Contractor shall submit to the Contracting Officer, as indicated in the contract requirements.

SCR-9 IDENTIFICATION OF GOVERNMENT-FURNISHED PROPERTY (APR 1984) (FAR 52.245-3):

See Section 00700

SCR-10 FORT WAINWRIGHT PHYSICAL DATA (APR 1984): Data and information furnished or referred to below are furnished for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

a. The indications of physical conditions on the drawings and in the specifications are the result of site investigation.

b. Location: Fort Wainwright is located adjacent to, and southeast of Fairbanks, Alaska.

c. Transportation:

(1) Water: Commercial cargo service is available from West Coast port cities of the mainland states to the Alaska ports of Anchorage, Valdez, Whittier and Seward.

(2) Truck: Truck service is available to Fairbanks from the port cities of Anchorage, Valdez, and Seward, Alaska, and from the 48 contiguous states over the Alaska Highway.

(3) Railroad: The Alaska Railroad offers freight service from the 48 contiguous states and Canada via rail barge and trainship through Whittier, and from Seward, to Anchorage and Fairbanks. In addition to the freight service, scheduled passenger service and express service between Anchorage and Fairbanks, and passenger service between Anchorage and Whittier are also available. Fairbanks (including Eielson AFB and Ft. Wainwright) is

the northern terminus, and Seward and Whittier are the southern terminals of the Alaska Railroad.

(4) Air: Commercial airlines operate to Fairbanks, Alaska.

d. Communications: Telephone communications and services for the Contractor's use are the responsibility of the Contractor. The Contractor shall make all arrangements and payment for telephone service. Contact Alaska Communications Systems, 1-800-478-3081. The Government does not guarantee the adequacy or efficiency of the service or the number of telephones that can be assigned to the Contractor.

e. Weather Data: A Climatological Summary for Fort Wainwright is attached to the end of this section.

SCR-11 AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984) (FAR 52.236-14):

SEE SECTION 00700

SCR-12 IDENTIFICATION OF EMPLOYEES AND MILITARY REGULATIONS:

(a) The Contractor shall be responsible for compliance with all regulations and orders of the Commanding Officer of the Military Installation, respecting identification of employees, movements on installation, parking, truck entry, and all other military regulations which may affect the work.

(b) The work under this contract is to be performed at an operating Military Installation with consequent restrictions on entry and movement of non-military personnel and equipment.

SCR-13 INSURANCE - WORK ON A GOVERNMENT INSTALLATION (JAN 1997) (FAR 52.228-5):

(a) The Contractor shall, at its own expense, provide and maintain during the entire performance of this contract, at least the following kinds and minimum amounts of insurance:

(1) Workman's Compensation and Employers' Liability Insurance: $100,000.00.

(2) General Liability Insurance: A Bodily Injury, Comprehensive policy which provides $500,000.00 per occurrence.

(3) Automobile Liability Insurance: A comprehensive policy which provides $200,000.00 per person and $500,000.00 per occurrence for bodily injury and $20,000.00 per occurrence for property damage, covering the operation of its automobiles used in connection with the performance of the contract.

SCR-14 RESERVED

SCR-15 THRU SCR-16 SEE SECTION 00700

SCR-18 THRU SCR-20 NOT USED

SCR-21 SEE SECTION 00700

SCR-22 SALVAGE MATERIALS AND EQUIPMENT

The Contractor shall maintain adequate property control records for all materials or equipment specified to be salvaged. These records may be in accordance with the Contractor's system of property control, if approved by the property administrator. The Contractor shall be responsible for the adequate storage and protection of all salvaged materials and equipment and shall replace, at no cost to the Government, all salvage materials and equipment which are broken or damaged during salvage operations as the result of its negligence, or while in its care. The Contractor shall salvage the below listed materials:

Direct buried 6" condensate line between Manhole H4-8-3 and Manhole H4-8-4.
Direct buried 6" condensate line between Manhole H4-9-1 and Manhole H4-9-2.

SCR-23 SEE SECTION 00700

SCR-24 NOT USED

SCR-25 COMMUNICATION SECURITY:

All communications with DOD organizations are subject to COMSEC review. Contractor personnel shall be aware that telecommunications networks are continually subject to intercept by unfriendly intelligence organizations. The DOD has authorized the military departments to conduct COMSEC monitoring and recording of telephone calls originating from or terminating at DOD organizations. Therefore, civilian Contractor personnel are advised that any time they place a call to or receive a call from Alaska District offices or Resident Engineer offices located on military installations, they are subject to COMSEC procedures. The Contractor will assume the responsibility for ensuring wide and frequent dissemination of the above information to all employees dealing with official DOD information.

SCR-26 PERMITS AND RESPONSIBILITIES:

See Section 00700

SCR-27 NOT USED

SCR-28 THRU SCR-29 SEE SECTION 00700

SCR-30 OPTION FOR INCREASED QUANTITY

a. The Government may increase the quantity of work awarded by exercising bid Items 0002 thru 0009 (option items 1 thru 8) as specified in the Bid Schedule, at any time, or not at all, but no later than September 30, 2004. Notice to Proceed on work added by exercise of the option will be given upon execution of consent of surety.

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

c. Optional items awarded shall be completed within the time period for completion of the base items, as stated in FAR CLAUSE 52.211-10, Commencement, Prosecution and Completion of Work.

SCR-31 THRU SCR-32 NOT USED

SCR-33 PAYMENT FOR MATERIALS DELIVERED OFF-SITE (1995 MAR HQ USACE) (EFARS 52.232-5000):

See Section 00700.

SCR-34 THRU SCR-35 NOT USED

SCR-36 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER (ER 415-1-15, 31 Oct 1989):

1. This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance with the Contract Clause entitled "DEFAULT (FIXED PRICE CONSTRUCTION)". In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

a. The weather experienced at the project site during the contract period must be found to be unusually severe; that is, more severe than the adverse weather anticipated for the project location during any given month.

b. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

2. The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

Monthly Anticipated Adverse Weather Delay Work Days Based on a 5-Day Work Week

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
22	20	21	0	0	1	1	1	0	10	21	22

Upon acknowledgement of the Notice to Proceed and continuing throughout the contract, the Contractor shall record on the daily CQC report, the occurrence of adverse weather and the resultant impact to normally scheduled work. Actual adverse weather delays days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day. The number of actual adverse weather days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day in each month, and be recorded as full days. If the number of actual adverse weather days exceeds the number of days anticipated in Paragraph 2, above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the Contract Clause entitled "DEFAULT (FIXED-PRICE CONSTRUCTION)".

SCR-37 SEE SECTION 00700
SCR-38 YEAR 2000 COMPLIANCE (OCT 1997) (FAR 39.106):

In accordance with FAR 39.106, the Contractor shall ensure that with respect to any design, construction, goods, or services under this contract as well as any subsequent task/delivery orders issued under this contract (if applicable), all information technology contained therein shall be Year 2000 compliant. Specifically, the Contractor shall:

(1) Perform, maintain, and provide an inventory of all major components to include structures, equipment, items, parts, and furnishings under this contract and each task/delivery order which may be affected by the Year 2000 compliance requirement.

(2) Indicate whether each component is currently Year 2000 compliant or requires an upgrade for compliance prior to Government acceptance.

SCR-39 THRU SCR-44 NOT USED

SCR-45 SAFETY AND HEALTH REQUIREMENTS MANUAL, EM 385-1-1, U.S. ARMY CORPS OF ENGINEERS:

EM 385-1-1 and its changes are available at http://www.hq.usace.army.mil (at the HQ homepage, select Safety and Occupational Health).

The Contractor shall be responsible for complying with the current edition and all changes posted on the web (see web address above) as of the effective date of this solicitation and shall comply with the version in effect on the contract award date. This EM 385-1-1 shall remain in effect throughout the life of the contract.

SCR-46 THRU SCR-111 NOT USED

SCR-112 SEE SECTION 00700

ATTACHMENT: CLIMATOLOGICAL SUMMARY

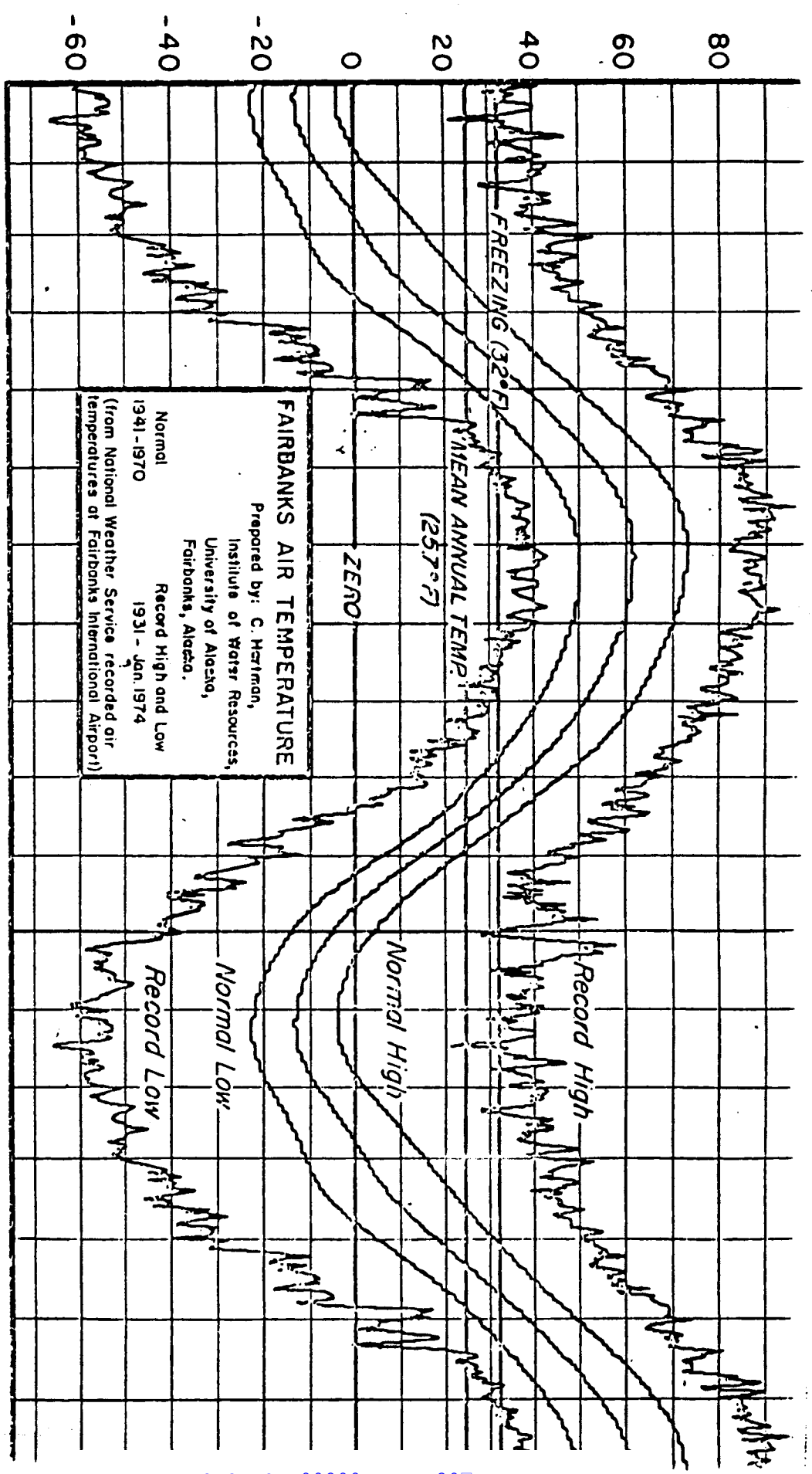
CLIMATOLOGICAL SUMMARY

FT. WAINWRIGHT (Period of record exceeds 25 years)

MEANS AND EXTREMES FOR PERIOD OF RECORD

Temperature		Mean Annual	25.9° F
		Highest Recorded	95.0° F
		Lowest Recorded	-62.0° F
		Maximum Freezing Index	6464 degree days (1950-51)
		Maximum Thawing Index	3568 degree days (1953)
Precipitation		Mean Annual	12.67"
		Mean Annual Snowfall	41.8"
		Maximum Monthly	4.31" July 1948
		Maximum Monthly Mean	2.27" Aug
		Maximum Rainfall During 24 hr Period	2.33" Aug
		Maximum Snowfall During 24 hr Period	15.5" Jan
		Maximum Monthly Snowfall	27.7" Dec 1955
Wind		Mean Hourly Speed	4.6 mph
		Prevailing Direction	ENE 7.2% (calm 32%)
		Maximum Velocity	61 mph
		Direction Maximum Velocity	SW
Annual Mean Number of Days	Sunrise to Sunset	Clear	72
		Partly Cloudy	90
		Cloudy	203
		Precipitation 0.01 inch or more	101
		Snow, Sleet, or Hail 1.0 inch or more	19
		Heavy Fog 0 - 3/4 mile visibility for 3/4% of the time	
		Thunderstorms	5
	Max Temp	≥ 70°	46
		≤ 32°	157
	Min Temp	≤ 32°	229
		≤ Zero	123

NPA Form 3
AUG 1958



--End of Special Contract Requirements--

PROJECT TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

01015 SPECIAL ITEMS
01180 RADIOACTIVE MATERIALS PROCEDURES
01271 MEASUREMENT, PAYMENT, AND CONTRACT COST BREAKDOWN
01312 QUALITY CONTROL SYSTEM (QCS)
01320 PROJECT SCHEDULE
01330 SUBMITTAL PROCEDURES
01356 STORM WATER POLLUTION PREVENTION MEASURES
01411 ENVIRONMENTAL PROTECTION
01420 SOURCES FOR REFERENCE PUBLICATIONS
01451 CONTRACTOR QUALITY CONTROL
01500 TEMPORARY CONSTRUCTION FACILITIES
01525 SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS
01581 PROJECT MARKER
01721 UTILITY MAINTENANCE INFORMATION SYSTEMS
01780 CLOSEOUT SUBMITTALS

DIVISION 02 - SITE WORK

02112 FIELD SCREEN TESTING OF SOILS FOR POL CONTAMINATION
02220 DEMOLITION
02300 EARTHWORK
02511 WATER DISTRIBUTION SYSTEMS IN UTILIDORS
02533 SEWERS IN UTILIDORS
02552 PRE-ENGINEERED UNDERGROUND HEAT DISTRIBUTION SYSTEM
02559 HEAT DISTRIBUTION SYSTEMS IN UTILIDORS AND MANHOLES
02560 UTILIDOR SYSTEM
02740 BASE COURSE AND BITUMINOUS PAVING FOR VEHICLE TRAFFIC AREAS
02760 FIELD MOLDED SEALANTS FOR SEALING JOINTS IN RIGID PAVEMENTS
02921 SEEDING
02930 EXTERIOR PLANTING

DIVISION 03 - CONCRETE

03101 FORMWORK FOR CONCRETE
03150 WATERSTOPS
03200 CONCRETE REINFORCEMENT
03300 CAST-IN-PLACE STRUCTURAL CONCRETE

DIVISION 05 - METALS

05090 WELDING, STRUCTURAL
05093 WELDING PRESSURE PIPING
05500 MISCELLANEOUS METAL

DIVISION 09 - FINISHES

09900 PAINTS AND COATINGS

DIVISION 13 - SPECIAL CONSTRUCTION

13110 CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE)
13280 ASBESTOS ABATEMENT
13281 LEAD HAZARD CONTROL ACTIVITIES

DIVISION 16 - ELECTRICAL

16070 SEISMIC PROTECTION FOR ELECTRICAL EQUIPMENT
16370 ELECTRICAL DISTRIBUTION SYSTEM, AERIAL
16375 ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND
16415 ELECTRICAL WORK, INTERIOR

-- End of Project Table of Contents --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01015

SPECIAL ITEMS

PART 1 GENERAL

1.1 SCOPE
1.2 REFERENCES
1.3 SUBMITTALS
1.4 ACCIDENT PREVENTION PLAN
1.5 FIRE SAFETY
1.6 COMPLIANCE WITH ALASKA STATE LABOR LAWS ON OCCUPATIONAL LICENSING-
1.7 EXCAVATION CLEARANCE REQUEST (ECR) - FORT WAINWRIGHT
1.8 TEMPORARY AND PERMANENT ELECTRICAL SERVICE HOOK-UP
1.9 UTILITY OUTAGES - FORT WAINWRIGHT
1.9.1 Telephone and Cable Outages
1.9.2 Notification and Posting of Outage Notices
1.9.3 Emergency Outages
1.10 DISPOSITION OF MATERIALS
1.10.1 Landfill Cover Requirements
1.10.1.1 Cover Layer Requirements
1.10.1.2 Cover Material Source
1.10.1.3 On-site Equipment Storage
1.11 TESTS
1.12 WARRANTY OF CONSTRUCTION
1.12.1 Failures
1.12.2 Warranty Tag
1.13 CAMP FACILITIES
1.14 PARTNERING
1.15 OPERATION AND MAINTENANCE (O & M) MANUALS
1.16 HEALTH HAZARD ASBESTOS
1.17 EARTHQUAKE-RESISTANT EQUIPMENT SUPPORTS
1.18 NPDES
1.19 NON-GOVERNMENT BORROW SOURCES
1.20 BIRDS' PROTECTION
1.21 REQUIRED UTILITY SERVICES
1.21.1 Utility Service Plan
1.21.2 Utility Line Isolation In Utilidor
1.21.3 Temporary Water Lines
1.22 TEMPORARY UTILITY REQUIREMENTS
1.22.1 Utilidor/Building Heating Prohibitions
1.22.2 Materials List for Temporary Utility Services
1.22.2.1 Environmental Protection for Temporary Sewer System
1.22.3 Steam
1.22.4 Sewer
1.22.5 Water

1.22.6 Electrical
1.22.6.1 Electrical Power Outages 4-hour Maximum Duration
1.22.7 Special Temporary Utilities Requirements
1.22.7.1 Commissary/PX facility (Building 3703 complex)
1.22.7.2 Building 3730
1.22.7.3 Physical Fitness Center (PFC)
1.23 COORDINATION OF WORK
1.24 SCHEDULING OF WORK
1.25 PHASING OF WORK
1.26 ATTACHMENTS

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

-- End of Section Table of Contents --

SECTION 01015

SPECIAL ITEMS

PART 1 GENERAL

1.1 SCOPE

Items included in this section cover special features and/or requirements which are not otherwise specified or indicated.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E 1527	(1993) Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process

CODE OF FEDERAL REGULATIONS (CFR)

40 CFR 262	Generators of Hazardous Waste
40 CFR 261	Identification and Listing of Hazardous Waste

NSF INTERNATIONAL (NSF)

NSF 61	(2002e) Drinking Water System Components - Health Effects

STATE OF ALASKA ADMINISTRATIVE CODE (AAC)

12 AAC 32	Electrical Administrators
12 AAC 39	Mechanical Administrators
18 AAC 60	(2003) Solid Waste Management
Title 08	(2003) Business and Professions

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for

	Construction
40 CFR 61	National Emission Standards for Hazardous Air Pollutants

U.S. ARMY CORPS OF ENGINEERS (USACE)

TI 809-04	(1998) Seismic Design for Buildings
EM 200-1-1	(1999) Validation of Analytical Chemistry Laboratories

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Utility Service Plan; G,

SD-03 Product Data

Materials list for temporary utility services

1.4 ACCIDENT PREVENTION PLAN

The Contractor shall obtain the Contracting Officer's approval of the Accident Prevention Plan required by the Safety and Health Requirements Manual referenced in paragraph Accident Prevention of the Contract Clauses prior to start of any work at the project site.

1.5 FIRE SAFETY

The Contractor shall obtain a permit from the organization having jurisdiction over the job site for any welding or open flame work.

1.6 COMPLIANCE WITH ALASKA STATE LABOR LAWS ON OCCUPATIONAL LICENSING-

The Contractor shall comply with the current provisions of Alaska Statutes Title 08 and Alaska Regulations 12 AAC 32 and 12 AAC 39 requiring licensed electrical and mechanical administrators to supervise and be responsible for the performance of all regulated categories of electrical and mechanical work performed on-site as part of this contract. The following is a partial list of areas covered by the Alaska State Regulations:

a. Controls and Control Wiring 12 AAC 32.275

b. Inside Communications 12 AAC 32.195

c. Residential Wiring 12 AAC 32.235

d. Outside Communications 12 AAC 32.125

e. Commercial Wiring 12 AAC 32.165

f. Line Work 12 AAC 32.075

g. Heating Cooling and Process Piping 12 AAC 39.232

h. Mechanical Systems Temperature Control 12 AAC 39.292

i. Residential Plumbing and Heating 12 AAC 39.312

j. HVAC/Sheet Metal 12 AAC 39.252

k. Refrigeration 12 AAC 39.272

The Contractor shall also be required to comply with State of Alaska requirements for occupational licensing of electrical and mechanical journeymen and apprentice craftsmen performing any work on-site as part of this contract. The ratio of individuals holding trainee certificates may not be more than two electrician trainees for every certified electrical journeyman, or residential wireman as applicable on a job site, or two power linemen trainees for every certified power lineman on the job site. The Contractor shall be prepared to demonstrate on demand, the licensing of the craftsmen engaged in the work.

1.7 EXCAVATION CLEARANCE REQUEST (ECR) - FORT WAINWRIGHT

a. Prior to the commencement of any excavation, trenching or other digging activity for all soil disturbing activities impacting soils six inches or more below the ground surface, the Contractor shall obtain an Excavation Clearance Request (ECR), USARAK Form 81-E. USARAK Form 81-E is commonly referred to as a "Dig Permit". The Contractor shall be responsible for providing all information required by the ECR to include obtaining all signatures from the organizations and individuals required on the ECR. A blank ECR form may be obtained from the Customer Service Desk at the Directorate of Public Works, Building 3015, Ft. Wainwright.

b. If contaminated soils, drums, unexploded ordnance, or unusual debris are found on or around any work site, the Contractor shall stop work immediately and notify the Fire Department or "911" in accordance with EM 200-1-1, Hazardous Materials and Regulated Waste Management. Additionally, the Contractor shall notify the Contracting Officers Representative (COR) immediately of any such action. Work at the site will be suspended until the area is cleared by DPW Environmental Resources and notification by the COR is given to the contractor allowing work to continue. Site clearance by Range Control is required if unexploded ordinance is involved.

c. Contaminated soil or groundwater removed from the work site must meet container type, sampling and analysis for potential contamination, marking and labeling, and moving and storage requirements specified in

Pamphlet 200-1 or as otherwise specified by DPW Environmental Resources prior to removal. Soil and groundwater shall not be removed from any part of the installation without written authorization from an authorized USARAK representative. All operations involving hazardous waste will be accomplished in accordance with USARAK Regulation 200-4, Environmental Quality: Hazardous Waste, Used Oil and Hazardous Material Management and EM 200-1-1, Hazardous Material and Regulated Waste Management.

1.8 TEMPORARY AND PERMANENT ELECTRICAL SERVICE HOOK-UP

The Contractor shall adhere to the following requirements when connecting to the existing Ft. Wainwright electrical power distribution system. These requirements are for either temporary or permanent power, for Contractor or Government field office(s), or any other temporary facilities used during the course of this contract.

a. The Contractor shall obtain permission from Utilities Distribution foreman before starting any work on the electrical distribution system. Contact may be made by telephone at (907) 353-6130 or in person at building 3022.

b. The Contractor shall provide all plant, labor, materials and supervision necessary for power hook-ups except for the final hook-up to the distribution system. Final hook-up will be accomplished by Post personnel (DPW Line-crews) who will close in the cutouts after inspecting all work.

c. All work shall be accomplished in a workman like manner and in accordance with all applicable codes (NEC and NESC).

d. All jobsite trailer(s)/building(s) shall be located a minimum of 20 feet from High Voltage power lines.

e. The Contractor shall coordinate the final hook-up to the electrical distribution system with the Utilities Distribution foreman through the DPW Project Manager and Contracting Officer.

1.9 UTILITY OUTAGES - FORT WAINWRIGHT

The Contractor shall submit, in writing, a request for a utility outage to the Distribution Foreman (by FAX @ 907-353-6159 or hand delivered to Building 3022) with as much lead time as possible, but not less than five (5) working days prior to the requested utility outage date. The Contractor shall be responsible for verification of facsimile transmission to the Distribution Foreman by calling 907-353-7139. Contracting Officer shall be notified 5 days in advance of outages to occupied buildings to allow coordination with occupants.

All outages are to be scheduled to occur between 0800 and 1500 hours Tuesdays through Thursdays, but in no case shall the duration of the outage exceed four (4) hours. If outages exceed 4 hours Contractor shall provide temporary utilities to all facilities affected by lateral work.

The Contractor shall identify utilities affected (water, sewer, steam, condensate, electricity), the facilities affected, the exact locations, the duration of the outage, and a brief explanation of the work to be performed.

The Contractor may request utility outages outside of the normal accepted time frames and durations listed above; however, the acceptance of the request will be at the discretion of the Director of Public Works.

At the discretion of the Director of Public Works, and when deemed necessary for safety, efficiency, and mission impact, the Director of Public Works may direct the outage to occur during a specific day, or time of day, to minimize the impact to the affected buildings. Attached to this section, see utility matrix for utility requirements to each affected building.

1.9.1 Telephone and Cable Outages

For commercial telephone and cable outages, the Contractor shall make those requests directly to the provider. No excavation shall be allowed until the provider has located and marked the utility line.

1.9.2 Notification and Posting of Outage Notices

Notification and posting of scheduled outage notices will be conducted as follows:

For Contractor initiated outage requests, the Contractor is responsible for posting outage notices on all affected buildings a minimum of 24 hours before the outage. The Contractor is responsible for posting notices at all building entrances and for notifying the designated building manager either in person or telephonically. The DPW customer service office will provide the DPW Project Manager and the Contractor a listing of the names and phone numbers of the building managers for the affected buildings.

If the work cannot be completed within the outage time requested, and another outage is necessary, a new request shall be submitted and approval obtained in advance for the additional time required.

When the work cannot be completed within the outage time requested and the DPW shop personnel are required to stay beyond their normal duty day, the Contractor will be held responsible for all overtime costs associated with the outage.

Valve operations on active utilities will be performed by post personnel.

1.9.3 Emergency Outages

For emergencies when advance notification of a utility outage cannot be made, the following procedures apply:

The Contractor will notify the Utilities Distribution Foreman who will then notify the DPW Customer Service Office and the on-duty Fire Department Assistant Chief of the general information and circumstances relating to the outage. The information to be provided includes the utility affected

(i.e. water, steam, or power), the general area of the affected outage and/or the specific buildings affected. The Utilities Foreman will provide periodic updates to the Customer Service Office during extended outages.

1.10 DISPOSITION OF MATERIALS

Combustible and noncombustible waste material shall be disposed of in the Ft. Wainwright Landfill. No burning of materials will be permitted. The landfill will be open by appointment only during the following hours (excluding Federal holidays): Monday - Thursday 0800 to 1600 hours and Friday 0800 to 1500 hours subject to the conditions listed below: A landfill Authorization Card will be required for each Contractor. The Contractor shall obtain the Authorization Cards from the Ft. Wainwright Environmental Office, Building 3023; phone 353-6249. Load sheets will be required for each load at the landfill gate per current practice. Questions concerning disposal of solid waste at the Ft Wainwright Landfill can be addressed to the Ft Wainwright Environmental Office at 353-6249.

Construction Debris:

a. Access must be coordinated at least one day in advance with DPW Grounds Maintenance Shop at 353-7192.

b. Contents of the load must be construction materials only with no mixed garbage such as food containers or other household type refuse. Mixed loads will be refused.

Asbestos:

a. Loads must be properly documented.

b. Access must be coordinated at least one day in advance with DPW Grounds Maintenance Shop at 353-7192.

c. Delivery time must be coordinated at least four hours before the landfill closes for the day to allow the operator enough time to cover the material before the landfill closes.

d. Disposal of asbestos waste is allowed in accordance with the following requirements; submit to the landfill operator a completed asbestos manifest form with each load of Asbestos Containing Material (ACM). ACM shall be segregated from non-asbestos containing building debris (the Ft. Wainwright landfill will not accept whole-building waste streams for disposal in the asbestos cell), properly contained in leak-tight containers and labeled. Labeling shall include description of contents, ACM source location (building number or utilidor location), and the Contractor's name and contract number for identification purposes.

Containers may be barrels, drums, or six-mil or thicker plastic bags. The ACM waste shall be placed in approved locations only as directed by the landfill operator. All containers shall have warning labels attached that state:

CAUTION CONTAINS ASBESTOS AVOID OPENING OR BREAKING CONTAINER BREATHING ASBESTOS IS HAZARDOUS TO YOUR HEALTH

OR

CAUTION CONTAINS ASBESTOS AVOID OPENING OR BREAKING CONTAINER BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM

Prohibitions and Special Restrictions:

a. Scavenging and Salvaging is prohibited.

b. Disposal of hazardous wastes, as defined by 40 CFR 261 is prohibited. Ensure waste meeting this definition is disposed of in accordance with 40 CFR 262, Standards Applicable to Generators of Hazardous Waste.

c. Disposal of raw sewage, liquids, radioactive material, explosives, oil, solvents, strong acids, untreated sewage sludge, septage, untreated pathogenic, and other waste defined under 18 AAC 60.910(28) is prohibited at this facility.

d. Disposal of lead-acid vehicle batteries is prohibited.

e. Disposal of polluted soil as defined by 18 AAC 60.025 & 330 is prohibited.

f. Disposal of trash other than construction debris is prohibited.

g. Drums must be empty and cleaned of fluids prior to crushing. All drums must be crushed and flattened prior to disposal.

h. Ensure that if scrap vehicles are accepted at the landfill, they are drained of all oil and petroleum products and lead-acid batteries are removed prior to disposal.

i. Any trees, shrubs or other vegetation that is to be disposed of in the Ft. Wainwright landfill shall be chipped prior to disposal. This requirement applies to all shrubs, vegetation and trees with a base diameter of 3 inches or less. All trees with a base diameter of greater than 3 inches shall be salvaged for public use. All waste materials from the salvage operations shall be chipped and disposed of in the landfill.

1.10.1 Landfill Cover Requirements

All construction and asbestos containing material (ACM) debris placed in the landfill by the Contractor's operations shall be covered daily. The Contractor shall provide all plant, labor, material, equipment and supervision necessary to cover all construction and ACM debris deposited in the landfill generated by this project's construction operations. The Contractor shall be responsible for providing cover in accordance with the requirements listed below and in accordance with all local, State, and Federal regulations. This work is considered incidental to the project

requirements and no separate payment will be made for this work.

1.10.1.1 Cover Layer Requirements

a. The material used to cover the construction debris and ACM cells shall be obtained from an approved source(s). See additional requirements listed in paragraph Cover Material Source below.

b. Material shall be spread in sufficient quantity and loose thickness to ensure that when compactive effort is applied that the cover material will consolidate easily and uniformly, and that all debris is covered. Loose cover material shall be spread in such a manner in a thickness so as to preclude damage to bagged ACM. Exposed debris or bagged ACM will not be allowed.

c. The maximum compacted thickness shall be 12 inches minimum and 24 inches maximum.

d. Compactive effort shall be applied uniformly across the entire surface employing equipment of a type specifically designed for use in this type of environment. Required compactive effort shall be equivalent to 3-passes of a D-6 dozer or heavier piece of equipment over the entire surface to be covered.

1.10.1.2 Cover Material Source

There are no borrow sources available at Ft. Wainwright, suitable cover material shall be provided from a source outside of Ft. Wainwright.

The Contracting Officer shall approve that source. This material shall meet the requirements outlined in the paragraph entitled NON-GOVERNMENT BORROW SOURCES.

The Contractor shall provide all plant, labor, equipment and supervision necessary for the acquisition, transport and off-loading of the cover material at the landfill.

1.10.1.3 On-site Equipment Storage

Storage of equipment associated with this effort may be stored within the boundary of the landfill. It is the Contractor's responsibility to safeguard against unauthorized access and operation of equipment during non-duty hours.

1.11 TESTS

The Contractor shall provide testing by an independent COE approved testing laboratory, except where specifically noted to be performed by the Government, in accordance with SECTION 01451 CONTRACTOR QUALITY CONTROL.

1.12 WARRANTY OF CONSTRUCTION

a. In addition to any other warranties in this contract, the Contractor warrants, except as provided in subparagraph "i" herein,

that the work performed under this contract conforms to the contract requirements and is free of any defect of equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

b. This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

c. The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or -controlled real or personal property, when that damage is the result of:

1. The Contractor's failure to conform to contract requirements; or

2. Any defect of equipment, material, workmanship, or design furnished.

d. The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

e. The Contracting Officer will notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.

f. If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

g. With respect to all warranties, expressed or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall:

1. Obtain all warranties that would be given in normal commercial practice;

2. Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and

3. Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

h. In the event the Contractor's warranty under subparagraph "b" herein has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

i. Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage which results from any defect in Government-furnished material or design.

j. This warranty shall not limit the Government's rights under the Inspection of Construction clause of this contract with respect to latent defects, gross mistakes, or fraud.

k. Defects in design or manufacture of equipment, specified by the Government on a "brand name and model" basis, shall not be included in this warranty. In this event, the Contractor shall require any subcontractors, manufacturers, or suppliers thereof to execute their warranties, in writing, directly to the Government.

1.12.1 Failures

Upon receipt of notice from the Government of failure of any part of warranted items during the warranty period, the affected part or parts shall be promptly replaced. Such replacement shall include furnishing and installing the necessary new part or parts, making all necessary repairs, restoring the affected item to the operating condition specified in this contract and making all such tests as are necessary to ensure that there are no remaining defects. Such tests shall be performed in the presence of representatives of the Using Agency indicated below. Upon final acceptance of the work or transfer of responsibility to the Government for operation and maintenance of the items covered, whichever is earlier, the Contractor shall be responsible to the Using Agency for the warranty provisions of this contract. A letter stating the applicable warranty provisions shall be furnished to the Contracting Officer in duplicate, in the format and text shown in the sample letter attached to this section.

Attn: APVR-WPW-EN Directorate of Public Works
3015 Montgomery Road, #6500
Fort Wainwright, Alaska 99703-6500

1.12.2 Warranty Tag

See specification section 01780, paragraph 1.3.5, Close-out Submittals for Warranty Tag Information.

1.13 CAMP FACILITIES

There are no Government owned camp facilities at the jobsite for the Contractor's use.

1.14 PARTNERING

The Government intends to encourage the foundation of a cohesive partnership with the Contractor and its subcontractors. This partnership will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objectives are effective and efficient contract performance, intended to achieve completion within

budget, on schedule, and in accordance with plans and specifications.

This partnership will be bilateral in makeup, and participation will be totally voluntary. Implementation of this initiative will be a topic of discussion at the Preconstruction Conference. Other recurring or special purpose meetings, as agreed between the Government and the Contractor, will be held as necessary to resolve contentious issues and maintain the partnering spirit.

1.15 OPERATION AND MAINTENANCE (O & M) MANUALS

One hard copy and one electronic CD ROM (matching hard copy) shall be submitted to the Contracting Officer not later than 30 days prior to scheduled contract completion. Failure to submit manuals by this date will be considered cause to withhold any payments due the Contractor. All equipment manual materials shall be durable, clearly printed or reproduced copies, not more than 8-1/2 x 11 inches in size, or neatly folded to that size without overlapping into the binding. Materials shall be indexed and bound in stiff covers with tab separators. Approval of manuals shall be obtained prior to scheduling operating tests and field training courses.

1.16 HEALTH HAZARD ASBESTOS

Minor amounts of asbestos may be present within building materials encountered while working with existing insulation, piping and equipment. The Contractor shall determine the presence of asbestos and, if present, notify the Contracting Officer immediately and provide safeguards and disposal methods, including work practices, respiratory protection and industrial hygiene measures, that satisfy 29 CFR 1910 and 29 CFR 1926.58. An equitable adjustment will be made to the contract for additional work required if asbestos is present. Removal and disposal shall also satisfy 40 CFR 61.140 through 61.156, with disposal satisfying 61.146(c)(1).

1.17 EARTHQUAKE-RESISTANT EQUIPMENT SUPPORTS

All items of electrical, mechanical, and other installed equipment shall be mounted to prevent damage from lateral motion caused by earthquake. Restraints for seismic loading shall comply with requirements in TI 809-04. Items of suspended or supported equipment subject to causing damage by swaying or tipping shall be cross-braced or laterally secured to the building structure. Any items of equipment mounted without rigid restraint of lateral motion shall have sufficient clearances and flexibility of associated wiring, piping, or other connections to accommodate the full range of such motion as might occur.

1.18 NPDES

Work shall comply with EPA National Pollutant Discharge Elimination System (NPDES General Permit No. AK-R-10-0000 for Construction Activities). See SECTION 01356 STORMWATER POLLUTION PREVENTION MEASURES for additional specific requirements.

1.19 NON-GOVERNMENT BORROW SOURCES

The Contractor shall check any non-Government, proposed borrow sources for the presence of hazardous substances and petroleum products as defined in ASTM E 1527. The publication includes guidance on previously examined sites. A Phase I Environmental Site Assessment, also as defined therein, shall be submitted for each proposed borrow site as a supplement to the Environmental Pollution Control Plan specified in SECTION 01411 ENVIRONMENT PROTECTION. The report shall identify any previous or current presence of hazardous substances at the site, regardless of whether they have been, or can be, released to the environment. The Assessment shall be performed under the direct supervision of an independent, registered professional engineer, currently licensed by the State in which the borrow source is located, and within such time frame as will ensure reports are valid when submitted. The engineer shall have a minimum of 3 years experience in performing satisfactory Environmental Site Assessments. All reports shall be certified in writing by the engineer and submitted in the standard format specified in the referenced publication, through the Contracting Officer, to the Post Environmental Office for review. Reports shall be submitted at least 30 days prior to needing borrow materials in the work. The qualifications of the engineer performing the Assessment shall be included with the report. Where hazardous materials are indicated, use of the source will not be allowed. No borrow materials shall be brought onto Government property without approval of the Contracting Officer. The Government reserves the right to sample and test any borrow materials delivered to the project for conformance with this specification.

1.20 BIRDS' PROTECTION

Federal and State law protects the Cliff Swallows that build mud nests on Base/Post facilities. Once the Cliff Swallow establishes nest and lays birds eggs, then the nest cannot be removed or annoyed until the nests are no longer occupied. Forcing or annoying the birds to abandon an occupied nest is a violation of State and Federal law. Any work including demolition of known Cliff Swallows nesting areas (i.e., eaves, porches, entranceways, tanks, etc.) shall be done prior to 10 May or after 1 August to avoid project delays.

The Contractor shall initiate a program to remove the partially completed nests daily from 10 May to 21 July to avoid work stoppage. The Contractor is responsible for all or any delays and charges filed by U.S. Fish and Wildlife Service and the State of Alaska Department of Public Safety due to his/her negligence in removing and/or annoying such established nests.

1.21 REQUIRED UTILITY SERVICES

The Contractor will be required to provide full temporary utilities and services for each facility affected by any outages during the execution of this contract, using materials that meet NSF 61 requirements.

1.21.1 Utility Service Plan

The Contractor shall provide a detailed plan, for Government approval, indicating the Contractor plans to maintain utility services to all

facilities during the performance of this contract. Contractor shall submit the Utility Service Plan in tabular form and shall include a corresponding site plan for each facility affected. Due to the large number and diversity of facilities affected, the Contractor shall allow 30 calendar days for review, coordination and approval of the plan. If revisions are necessary, the Contractor shall adjust the plan as necessary and resubmit the revised plan for approval. The Contractor shall provide a revised plan within 7 calendar days and allow an additional 15 calendar days for review, coordination, and approval of the revised plan. No construction operations may begin until approval of the Utility Service Plan has been obtained. If project construction will be performed in stages, the Contractor is responsible to obtain Interim Approval from ADEC to operate completed water line sections.

1.21.2 Utility Line Isolation In Utilidor

The Contractor shall isolate all water, sewer, and steam and condensate lines with flanged connections, gaskets, and bolted-on blind flanges. All lines 2 inches NPS and larger shall employ welded slip-on flanges, and all lines smaller than 2 inches NPS may be welded slip-on or screwed-on flanges at the Contractor's option. All work and materials accomplished/provided shall meet the requirements as outlined below:

a. SECTION 05093 WELDING PRESSURE PIPING

b. SECTION 02559 HEAT DISTRIBUTION SYSTEMS IN UTILIDORS AND MANHOLES

The Contractor shall coordinate temporary utility outages with the Post Utility Foreman. A minimum of 5 days advanced notice will be required for the outage. Once the outage is in effect, the Contractor shall expedite the isolation operations so as to minimize the utility disruption. Post personnel will perform actual valve operations.

1.21.3 Temporary Water Lines

All temporary potable water lines shall be disinfected in accordance with SECTION 02511 WATER DISTRIBUTION SYSTEMS IN UTILIDORS. Temporary water lines must comply with NSF 61 material requirements.

1.22 TEMPORARY UTILITY REQUIREMENTS

It is the Contractor's responsibility to carefully review the requirements of this paragraph, field verify the information provided for accuracy, and seek clarification/guidance/direction from the Contracting Officer for any questions. If Contractor believes any outage information or details were overlooked, the discrepancy(s) should be brought to the Contracting Officer's attention and resolved.

1.22.1 Utilidor/Building Heating Prohibitions

Temporary heat for the utilidor or buildings shall not be accomplished with electricity. Buildings shall be heated using the same medium as is currently in use. The utilidor shall be heated using form of unit heaters, steam or oil fired forced air heat (i.e. salamander) or some other

alternate method of the Contractor's devising. Whichever heating medium the Contractor elects to employ, that method shall be coordinated through the Contracting Officer.

1.22.2 Materials List for Temporary Utility Services

The Contractor shall submit a list of all materials used in providing temporary utilities for this project. This list shall be provided in tabular form and include the following:

a. Building number

b. Material type(s) and size(s)

c. Intended usage

1.22.2.1 Environmental Protection for Temporary Sewer System

The Contractor shall submit, as part of his TEMPORARY UTILITY PLAN, an environmental protection segment that specifically addresses how the Contractor will deal with unintended discharge of raw sewage onto the ground or in the utilidor. The plan shall include the following:

a. Primary POC (name and phone #).

b. Alternate POC (name and phone #).

c. Monitoring/maintenance person (this person shall be capable of operating/maintaining/repairing the equipment and components).

d. Containment plan complete with a list of equipment/materials to be employed to contain the discharge.

e. Cleanup plan.

f. Personnel health and safety plan.

g. Notification plan in the event of an unintended discharge of raw sewage.

1.22.3 Steam

The only time a building can be without steam is 1 JUNE through 1 SEPTEMBER. This exemption for steam service does not apply if full utilities are required at all times for a particular building (see below).

1.22.4 Sewer

Work at intersection of Meridian and Montgomery Rd will require temporary sewer for all buildings from the east, and the following buildings from the west:

a. 3015

b. 3026

c. 3021

d. 3020

1.22.5 Water

Work at intersection of Meridian and Montgomery Rd will require temporary water for Buildings 3008, 3011, and the following buildings from the west:

a. 3015

b. 3026

c. 3021

d. 3020

1.22.6 Electrical

1.22.6.1 Electrical Power Outages 4-hour Maximum Duration

If for some reason electrical power will be affected, the following buildings cannot have an outage lasting more than 4 hours:

a. 3008

b. 3011

c. 3015

d. 3026

e. 3021

f. 3020

g. 3033

h. 3031

1.22.7 Special Temporary Utilities Requirements

1.22.7.1 Commissary/PX facility (Building 3703 complex)

Full temporary utilities will be required at all times for this facility. No outages of any kind are permitted.

1.22.7.2 Building 3730

Temporary sewer and water are required for this facility. If steam is cut off from 1 JUNE through 1 SEPTEMBER, the Contractor must provide Building 3730 with temporary hot water pressure washers that provide equivalent

service as the units that would be knocked off line by a steam outage.

1.22.7.3 Physical Fitness Center (PFC)

The PFC (Building 3709) will require full temporary utilities at all times. If any temporary utility outage is necessary, it is only permitted after PFC business hours, and IAW any other requirements noted above.

1.23 COORDINATION OF WORK

Traffic control plan shall be submitted 60 days in advance of construction commencement. Any changes or modifications to the traffic control plan will require an additional 30-day Government review period. Detour and construction signage must be posted 7 days in advance of any closure or detour. Detours, temporary roads and closures must be coordinated through the Contracting Officer. Notification to newspapers & TV must be coordinated 30-days in advance of construction.

Montgomery Road at Meridan may be closed for a maximum of 2 months.

Meridian may not be closed during construction, except for small, regional detours. Access to the Physical Fitness Center from Meridan must remain open at all times.

The main access to the Commissary from Oak Avenue must remain open for truck deliveries. Also access to Commissary parking must remain open.

Provide access for local traffic on all roads.

During closure of Meridian road, traffic shall be routed onto Whidden road. This road shall be used for two way traffic until completion of the intersection at Meridian and Montgomery. The Contractor shall install a temporary traffic light, complete with traffic controller. The traffic light controller shall include a means of sensing traffic when present at Whidden Road waiting to pull onto Gaffney. Appropriate signage shall be supplied for other roads affected during this revision. The road shall be restriped for two way traffic and returned to one way striping upon completion of the work. Restriping of lanes shall be utilized in place of lane separation cones.

2-way detour traffic (off existing paved roads) access with 13 foot wide lanes must be maintained.

During closure of Neely Road, traffic shall be detoured and temporary roads shall be constructed to provide vehicle and delivery truck access to Building 3727 (Arts and Craft Shop) and Building 3728 (DFAC) from Oak Avenue. In the event that construction interferes with permanent parking areas around the buildings, temporary parking areas shall be constructed by Contractor, with access from Oak Avenue. Temporary roads crossing drainage ditches shall be temporarily culverted or bridged. Access to Building 3726 (Post Office) from Meridian Road shall remain open. A pedestrian crossing must be provided across Neely Road to allow access. Temporary roads and parking shall be established and maintained as specified in SECTION 01500.

1.24 SCHEDULING OF WORK

The Contractor shall limit his work between 0600 hours and 2200 hours everday while working within the Barracks vicinities (Building Number 3706, 3707 and 3708). Construction noise shall be kept to minimum and without disturbing the Barracks' residents daily activities.

1.25 PHASING OF WORK

The base bid item shall be accomplished in the following order: Montgomery Road and Oak Avenue shall be completed first prior to start working on Neely Road. Bid item 0009 (Option 8) Electrical Feeder 12-13 can be worked on at any time if awarded.

1.26 ATTACHMENTS

Required Utility Services During Construction

Institutional Controls

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

S A M P L E L E T T E R

Contracting Officer
Date_____
Address (as stated in Notice of Award)

SUBJECT: Warranty Provisions, Contract

GENTLEMEN:

This is to acknowledge our responsibility in connection with the warranty provisions of this contract as set forth in the contract specifications.

The following items, equipment or systems furnished or installed under this contract are hereby warranted against defective design, material and workmanship for a period as indicated:

Warranted Item, Equipment or System	Identification Serial Number, Etc.	Warranty Expires at 11:59 PM Std. Time
_____	_____	_____
_____	_____	_____
_____	_____	_____

Upon receipt of notice from the Government of failure of any part or parts of the warranted item, equipment, or system during the warranty period, the affected part or parts will be replaced promptly with new parts. Such replacement will include furnishing and installing the new part or parts, making all necessary repairs, restoring the item, equipment, or system to the operating condition specified in this contract and making all such tests as are necessary to ensure that there are no remaining defects. Such tests will be performed in the presence of the Representative of the Using Agency indicated below.

We are responsible to _____ for the warranty provisions of this contract. Correspondence regarding the failure of any of the preceding items, equipment or systems covered by the warranty provisions of this contract should be addressed to:

	Telephone Number:
_____	
_____	_____
_____	_____

Very truly yours,

Signed: _____
Title: _____
Organization: _____

REQUIRED TEMPORARY UTILITIES DURING CONSTRUCTION

The following is a list of the facilities affected by this contract and the required temporary utilities that must be provided.

See attched matrix showing required utility service during construction.

For clarification, the term "full utilities required" shall be interpreted by the Contractor as including, as a minimum, the following:

a. Water

b. Sewer

c. Steam (supply and condensate return)

d. Electricity

e. Gas (to include - propane, fuel oil, etc.)

SCHEDULE: REQUIRED UTILITY SERVICE DURING CONSTRUCTION

BLDG. NO.	OCCUPANT	NO. OF OCC.	BLDG. TYPE	SERVICE REQUIRED					NOTES	POCs
				STM	WTR	SWR	ELEC	ALARM		
2085	68th MED	50 (est.)	Hangar 6	5	1	1	1	1	This Hgr is an alternate maintenance location for occupants displaced from Hangars 2 & 3.	CPT Kevin Rapp, SGT Sturgill, 3-6877
2104	COE NAO	50 (est.)	1 story office	1	1	1	1	1	"Mission critical" facility	Phil Salmon
2106	FWA Mobility Complex (DPTSM)	40 (est.)	Hngr 4 & 5	5	5	5	1	1	Bldg was vacated (both sides) for hangar door job. Hgr 4 is normally unutilized, Hgr 5 was formerlly used for aircraft parts whse.	
2108	Deluge Bldg.	0	tank & pumproom	4	1	1	1	1	Knocking this bldg off line requires Hangar 4/5 to be vacated of aircraft.	POC: Dave Kramer, FWA Water Plant, 3-7108
2107	Education Annex	9 - 110	office / classrooms	1	1	1	1	1	There are 48 parking spaces between bldgs 2107 and 2110. "Mission critical" facility.	Richard Mauer, 3-7270
2110	Education Center	9 - 60	office / classrooms	1	1	1	1	1	"Mission critical" facility. Located west of bldg 2107	Richard Mauer, 3-7270
3000	Flight Simulator Facility (DPTSM)	15-50	training bldg	1	1	1	1	1	"Mission critical" facility	Civ'n. manager: J.D Smith or Mark Paully, 3-7095 or -7098
3004	FWA Fire Sta. No. 1	15 full time	fire station / dorm	1	1	1	1	1	"Mission critical" facility. Can fill fire trucks at hydrants if necessary. Have their own standby genset to use for short outages.	NAO now in Bldg. 3025 2014 is now SBCT admin. space Diff POC
2998	Haz. Stor. Shed	0	Canopy w/ fence	2	2	2	2	2	No utilities.	Chief Mark Howdeschell, 3-7417 or SFC Lein 3-7460

SCHEDULE: REQUIRED UTILITY SERVICE DURING CONSTRUCTION

BLDG. NO.	OCCUPANT	NO. OF OCC.	BLDG. TYPE	SERVICE REQUIRED					NOTES	POCs
				STM	WTR	SWR	ELEC	ALARM		
3003	DPW's raw water point	0	CMU well-house	4	2	2	1	N/A	Bldg has its own well. Built in 1944. Has steam for heat, but well is only used in summer months. Has a connection to utilidor piping (pipes are boxed, and box filled with sawdust for insulation). Will have to temporarily flange off conection to utilidor piping so well-house can be used by KTRs for dust control.	POC: Dave Kramer, FWA Water Plant, 3-7108
3010	4-123rd Av. Btn.	70 - 170	Battalion HQ	1	1	1	1	1	"Mission critical" facility. Has 2 classrooms.	Sgt Johnson (S4), 3-7767
3005	A Co. & HHC 4th Btn, 123rd Av.	50	Hangar 3	5	5	5	1	1	Will need to remove aircraft during work. Maybe FD will allow work on aircraft near door, w/ Tug attached. See note for Hgr 2, below.	Chief Mark Howdeschell, 3-7417 or SFC Lein 3-7460
3006	HHC Storage	0	Butler style bldg	2	2	2	2	2	Might be torn down	Chief Mark Howdeschell, 3-7417 or SFC Lein 3-7460
2999	Haz. Stor. Shed	0	Canopy w/ fence	2	2	2	2	2	No utilities. Located between Hgrs 2 & 3	
3008	A Co. 4th Btn, 123rd Av.	60	Hangar 2	5	5	5	1	1	123rd's mechanics can use Hangars 6 or 7/8 as alternate maintenance points.	CPT. Groh (she) 3-6856
3011	Facilities Engr. Fire Prot. Water Res. #1	0	Water reservoir	4	2	2	1	1	Knocking this bldg off line requires Hangars 2 & 3 to be vacated of aircraft.	POC: Dave Kramer, FWA Water Plant, 3-7108
3009 (west)	"Miles Warehouse"	0	Butler style whse	2	2	2	2	2	Scheduled for demo	

SCHEDULE: REQUIRED UTILITY SERVICE DURING CONSTRUCTION

BLDG. NO.	OCCUPANT	NO. OF OCC.	BLDG. TYPE	SERVICE REQUIRED					NOTES	POCs
				STM	WTR	SWR	ELEC	ALARM		
3009 (east)	Training Support Cntr. Stor. (DPTSM)	0	Butler style whse	2	2	2	2	2	Scheduled for demo	Employee on site said they were told to vacate bldg by OCT 01. POC: Mike Czopek, 356-3570
2109	Military Working Dog Kennel	10	1 story	5	1	1	1	1	"Mission critical" facility. Requires pressurized potable water and temporary sewer	

Notes:

1 Requires full temporary utilities.
2 Can be off during summer months (no utilities).
3 Requires a minimum of (2) porta-potties, (2) hand-wash stations, (2) bottled water stations.
4 No steam outages may occur before 15 May or after 15 October.
5 For manned facilities other than "Mission Critical" where outages are anticipated to last more than 2 weeks, the Contractor shall provide full temporary utilities.

SCHEDULE: REQUIRED UTILITY SERVICE DURING CONSTRUCTION

BLDG. NO.	OCCUPANT	NO. OF OCC.	BLDG. TYPE	SERVICE REQUIRED					NOTES	POCs
				STM	WTR	SWR	ELEC	ALARM		
3706	UPH Barracks, A CO 2-1 INF REGT	56	3-story barracks	1	1	1	1	1	"mission critical" facility	SPC Theodore Reeder, 353-1468
3707	Company Admin	70	1-story office	1	1	1	1	1	"mission critical" facility	SPC Theodore Reeder, 353-1468
3708	UPH Barracks, 172nd SPT BN	56	3-story barracks	1	1	1	1	1	"mission critical" facility	POC: 353-2304
3711	UPH Barracks, 562nd ENG	56	3-story barracks	1	1	1	1	1	"mission critical" facility	MSG David Devers, 353-7658 / 1358
3712	Company Admin	70	1-story office	1	1	1	1	1	"mission critical" facility	POC: 353-1471
3713	UPH Barracks w/ Co HQ	56	3-story barracks	1	1	1	1	1	"mission critical" facility	POC: 353-2184
3716	UPH Barracks	56	3-story barracks	1	1	1	1	1	"mission critical" facility	CPT Anne Bailey, 353-2231, anne.bailey@wainwright.army.mil
3717	Company Admin	70	1-story office	1	1	1	1	1	"mission critical" facility	POC: 353-2304
3718	UPH Barracks, 4-123rd AVN	56	3-story barracks	1	1	1	1	1	"mission critical" facility	POC: 353-6283 and 353-1276
3719	UPH Barracks, 4-123rd AVN REG	56	3-story barracks	1	1	1	1	1	"mission critical" facility	POC: 353-1157
3720	UPH Barracks, 4-123rd AVN, B Co	56	3-story barracks	1	1	1	1	1	"mission critical" facility	POC: 353-9652, 1SG
3721	TRANSIENT UPH, DPW	0 - 100	3-st, former barracks	5	5	5	1	1		DPW, POC: 353-7287
3722	Company Admin	30	1-story office	1	1	1	1	1	"mission critical" facility	POC: 353-6267
3723	Floor 2 & 3 // 562nd ENG	0 - 100	Transient barracks	1	1	1	1	1	"mission critical" facility	MSG David Devers, 353-7658 / 1358
3723	South 1/2 of 1st floor // 562nd ENG	6	Co Admin							SSG John Saucedo, 353-2939
3723	North 1/2 of 1st floor // ACAP	10	ACAP Admin							ACAP, 353-2099
3724	Sewage	0	Sewage Lift Station	1	1	1	1	?	"mission critical" facility	POC: 353-7139, Charlie Davenport, DPW-U
3726	USPS	4	Post Office	1	1	1	1	1	"mission critical" facility	POC: 452-3237, lola.f.hargrave-fuller@usps.gov
3727	Rec Services, Arts & Crafts Shop	50	1-story Shop	4	1	1	1	1	"mission critical" facility	POC: 353-7311
3728	DFAC	300	Dining Facility	1	1	1	1	1	"mission critical" facility	POC: 353-1157

Notes:

1. Requires full temporary utility.
2. Total outage for the noted utility may occur between 15 May and 1 September
3. Requires a minimum of (2) Porta-Potties, (2) hand-wash stations, (2) bottled water stations.
4. No steam outages may occur before 15 May or after 1 September
5. Where outages are anticipated to last more than 2-weeks, the Contractor shall provide full temporary utilities.

DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY ALASKA
600 RICHARDSON DRIVE #5000
FORT RICHARDSON, ALASKA 99505-5000

REPLY TO
ATTENTION OF:

APVR-RPW-EV (200-1c)

FEB 25 1999

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Institutional Controls

1. All organizations conducting activities on United States Army Alaska (USARAK) controlled land are responsible for complying with established institutional controls. Institutional controls are administrative measures to control property usage and are applicable to all known or suspected contaminated sites. Institutional controls such as water use and property transfer restrictions will supplement engineering controls as appropriate for short- and long-term management to prevent or limit exposure to hazardous substances, pollutants, or contaminants. Institutional controls include, among other things: limiting excavation, restricting use of groundwater, or prohibiting certain land uses. For example, organizations must obtain an Excavation Clearance Request (see enclosure) for all soil disturbing activities impacting soils six inches or more below the ground surface. Excavation Clearance Requests are available at the Public Works Customer Service Desks at Building 730 at Fort Richardson, Building 3015 at Fort Wainwright, and Building 605 at Fort Greely.

2. In addition, USARAK has issued decision documents and/or Records of Decision (RODs) which require the implementation of institutional controls. USARAK Public Works, Real Property maintains copies of all decision documents and RODs requiring institutional controls in its real property files. USARAK Public Works, Master Planning will provide regularly updated post maps showing all areas affected by institutional controls. Copies of these maps will be available to each directorate, activity, and tenant organization. To ensure the effectiveness of institutional controls, all organizational units and tenant activities will be informed on an annual basis of institutional controls on contaminated soils and groundwater in effect on USARAK property.

3. Institutional controls are enforceable by the U.S. Environmental Protection Agency (EPA) and the State of Alaska, Department of Environmental Conservation (ADEC). Failure to comply with an institutional control adopted in a decision document or ROD signed by USARAK, U.S. Army Pacific, or the Department of the Army, may violate a USARAK Federal Facility Agreement and may result in stipulated fines and penalties. This does not include the costs of corrective actions required due to violation of an established institutional control.

APVR-RPW-EV
SUBJECT: Institutional Controls

4. Where institutional controls are applicable to any organization, tenant, or activity, land use restrictions shall be incorporated into either a lease or memorandum of agreement, as appropriate.

5. Costs for any and all remedial actions and fines and/or stipulated penalties levied as a result of a violation of an established institutional control shall be funded by the violating activity or organization.

Encl
Excavation Clearance Request

DEAN W. CASH
Major General, USA
Commanding

DISTRIBUTION:
A

2

EXCAVATION CLEARANCE REQUEST
DIRECTORATE OF PUBLIC WORKS, FORT WAINWRIGHT, ALASKA

NOTE: Locates require 72-hour notice
(except where indicated)

...est clearance to proceed with work at _____
(specific location)

Work Order /Contract # _____ Contractor: _____ POC Name/Phone _____

TYPE OF WORK REQUIRED: (provide brief but complete description of work to be performed)

_____

_____

Project Dates _____ thru _____

Above Construction Checked for Conflicts with the Following:

Department	Conflict	Signing Official	Date
Electric Shop, Bldg. 3022 (East) 353-6777 (Interior Elect & Alarm)	Yes No		
Utilidor Shop, Bldg 3022 (West) 353-7139 (Steam, Water, Sewer)	Yes No		
Power Distribution, Bldg. 3022 (West) 353-7139 (Overhead Electric)	Yes No		
Environmental, Bldg. 3023 353-9686	Yes No		
Engineering, Design/Contract Mgmt, Bldg 3015 353-6243	Yes No		
Fire Dept. Bldg. 3004 353-6485 (Use of Hydrant Sys/Road Closure)	Yes No		
Telephone Sys. Bldg 1080 353-6101 (A Co, 408 Sig. Bn)	Yes No		
...Communications 478-3052 (24 hour notice)	Yes No		
...a Cable Network phone 452-5100	Yes No		

Explanation of Conflicts Identified Above (annotate on drawings):

_____

_____

_____

If Required:

Alaska Railroad if excavating within 100 feet of railroad right of way 907-265-2401 (10 day notice required)
Ammo Area Bldg. 2200 353-6440 (Security Only)
Provost Marshall Bldg 3028 353-7836 (Road Closure Only)
Customer Service Desk, Bldg. 3015 353-7870 (Utility Outages Only)

Special Requirements Note:

☐ **INSTITUTIONAL CONTROLS AREA - POTENTIALLY CONTAMINATED AREA, SPECIAL PRECAUTIONS APPLY - SEE SOP and NOTE REQUIREMENTS #6 AND #7 BELOW**

1. This clearance authorizes commencement of excavation work only and IS NOT A NOTICE TO PROCEED OR WORK AUTHORIZATION.
2. This excavation clearance is effective upon the date of signature by DPW official below; EXCAVATION SHALL COMMENCE WITHIN 30 CALENDAR DAYS.
3. Requester will provide two copies of required work site drawings with excavation clearance request. DPW will retain one copy of these drawings.
4. Requester will retain original completed excavation clearance request. DPW will retain a copy of the request.
5. Boring locations must be marked on a 1/100 scale drawing.
6. All soil to be removed from the work site shall be disposed of in accordance with guidance from the DPW Environmental Resources Dept.
7. An after action report concerning work at sites where institutional controls are in place shall be submitted to DPW Environmental Resources Dept. NLT 30 days following completion of work.

_____
Requester's Signature Date

APPROVED: _____
Chief, Engineering Department Date
Bldg 3015 353-6243

EXPIRATION DATE (+30 days from above approval date): _____

USARAK Form 81-E(B)
1 Jan 98

EXAMPLE

EXCAVATION CLEARANCE REQUEST
DIRECTORATE OF PUBLIC WORKS, FORT RICHARDSON, ALASKA

NOTE: Locates require 72-hour notice
(except where indicated)

est clearance to proceed with excavation work at _____
(specific location)

Work Order /Contract # _____ Contractor: _____ POC Name/Phone _____

TYPE OF WORK REQUIRED: (provide brief but complete description of work to be performed)

_____

_____

Project Dates _____ thru _____

Above Construction Checked for Conflicts with the Following:

Department	Conflict	Signing Official	Date
Utilities, Bldg 700 384-1807 (steam/gas/water)	Yes No		
Utilities, Bldg 700 384-3677 (electricity)	Yes No		
Utilities, Bldg 704 384-1717 (sewer/POL)	Yes No		
Environmental, Bldg 724 384-3175/3046	Yes No		
Engineering Design, Bldg 730 384-2601	Yes No		
Engineering, Contract Management, Bldg 724 384-3054	Yes No		
Fire Department, Bldg 654 384-3130/3131	Yes No		
69th Signal Bn, Bldg 652 384-0001 (communications)	Yes No		
Locating Service – Locate Request Number: _____			
3121-Covers: ATU	Yes No		
ENSTAR	Yes No		
GCI Cable	Yes No		

Explanation of Conflicts Identified Above (annotate on drawings):

_____

_____

_____

If Required:

Alaska Railroad if excavating within 100 feet of railroad right of way 907-265-2401 (16 day notice required)
Ammo Area A or C Bldg 700, (Robert Hall 384-3843) (Security Only)
Provost Marshall Bldg 654, 384-0801 (Road Closure Only)
Customer Service Desk, Bldg 750, 384-3664, 3620 (loss of utility Only)
Fire Dept., Bldg 654, 384-0774 (loss of hydrant, water or road closure Only)

Special Requirements Note:

☐ **INSTITUTIONAL CONTROLS AREA - POTENTIALLY CONTAMINATED AREA, SPECIAL PRECAUTIONS APPLY - SEE SOP and NOTE REQUIREMENTS #6 AND #7 BELOW**

1. This clearance authorizes commencement of excavation work only and is NOT A NOTICE TO PROCEED OR WORK AUTHORIZATION.
2. This excavation clearance is effective upon the date of signature by DPW official below; EXCAVATION SHALL COMMENCE WITHIN 30 CALENDAR DAYS.
3. Requester will provide two copies of requires work site drawings with excavation clearance request. DPW will retain one copy of these drawings.
4. Requester will retain original completed excavation clearance request. DPW will retain a copy of the request.
5. Boring locations must be marked on a 1/100 scale drawing.
6. All soil to be removed from the work site shall be disposed of in accordance with guidance from the DPW Environmental Resources Dept.
7. An after action report concerning work at sites where institutional controls are in place shall be submitted to DPW Environmental Resources Dept. NLT 30 days following completion of work.

_____ Requester's Signature Date

APPROVED: _____ DPW Deputy Director or Department Chief Date

EXPIRATION DATE (+30 days from above approval date): _____

USARAK Form 81-F(A)
1 Jun 99

APVR-RPW (200-1)

U.S. Army Alaska Institutional Controls
Standard Operating Procedures

1. References:

a. AR 200-1, Environmental Protection and Enhancement
b. AR 200-2, Army Institutional Control Program Enforcement
c. USARAK 200-4, Environmental Quality; Hazardous Waste, Used Oil and Hazardous Materials Management
d. AR 210-20, Army Installation Master Planning
e. 40 CFR 300, National Oil and Hazardous Substances Pollution Contingency Plan.
f. 42 USC 1901 *et sequa*, Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as Amended by the Superfund Amendment and Reauthorization Act of 1986.
g. Federal Facility Agreements for Forts Richardson and Wainwright
h. Defense-State Memorandum of Agreement.
i. Operable Unit Records of Decision and/or other decision documents as appropriate.

2. Purpose. These Standard Operating Procedures establish the responsibilities, policies and procedures for complying with Department of Defense (DOD), Department of the Army (DA), and US Army Alaska (USARAK) Regulations as well as Federal and State Laws for instituting, maintaining, and enforcing Institutional Controls (IC) on Federal Facilities. These controls have been established to implement the selected remedial actions agreed upon by the U.S. Army (Army), the U.S. Environmental Protection Agency (EPA), and the Alaska Department of Environmental Conservation (ADEC) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act as amended by the Superfund Amendment Reauthorization Act. The details of these agreements may be found in the Decision Documents (DD) and Records of Decision (RODs) which are maintained in the Public Works, Environmental Offices. These agreements have been executed in accordance with the authority cited in Section 1.

Institutional Controls are a legal or administrative action designed to minimize the risk of exposure to contaminates at a source area where contamination has been left in the soil or groundwater. Institutional controls such as water use and property transfer restrictions will supplement engineering controls as appropriate for short- and long-term management to prevent or limit exposure to hazardous substances, pollutants, or contaminants. Typical controls are:

- Installation and maintenance o$igns or fences to restrict access to an area;

- Designation of contaminated areas on the Installation Master Plan for distribution to affected units and tenant organizations;

- Periodic publication and distribution of fact sheets identifying the areas of concern;

- Provide all contract agencies with construction, excavation and well installation restrictions.

These controls have been established to prohibit or limit access to or use of the land, surface water, and ground water and are applicable to all known or suspected contaminated sites. The following are examples of the restrictions agreed upon in the RODs:

- Land use restrictions prohibit or limit the construction or renovation of new or existing facilities to include residential area new construction, road repair and realignment, utility work, digging, trenching, excavation, paving, or drilling of soil borings and wells.

- Recreational use of natural resources i.e., camping, fishing, hunting etc., and training activities i.e., bivouac, combat maneuvers, land navigation, construction of fighting positions, etc., can be prohibited or limited depending on the type of contaminant present.

- Surface water restrictions prohibit ingestion of the water or consumption of fish, or other animal that directly uses a surface water source as a habitat or food source.

- Groundwater restrictions prohibit the drilling of water wells for potable water, fire suppression, irrigation or other purposes.

These restrictions remain in place until EPA, ADEC, and the Army mutually decide the contamination has been reduced, through cleanup activities or natural attenuation, to levels protective of human health and the environment. In making their decision, EPA, ADEC, and the Army will look at levels specified in the ROD or other decision document. If no decision document exists, EPA, ADEC, and the Army will look at maximum contaminant levels (MCLs) for potable groundwater or risk-based concentrations for soil, sediment, surface water and other uses of groundwater.

3. Scope: These Standing Operating Procedures apply to all USARAK units and activities, Military and Civilian Support Activities, Tenant Organizations and

agencies, and Government and Civilian Contractors that occupy, use, build, repair or maintain facilities on USARAK controlled lands.

4. Responsibilities:

a. The Installation Commander or his designee shall approve all Decision Documents and Records of Decision regarding remedial actions and Institutional Controls on USARAK controlled lands. Installation Commander shall also require compliance with these Decision Documents and Records of Decision.

b. Directorate of Public Works shall execute all aspects of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in accordance with the Defense Environmental Restoration Program as agreed upon in the Federal Facility Agreements and the Defense-State Memorandum of Agreement. Public Works shall also:

(1) Establish, maintain, and routinely update complete records of all known or suspected sites, restoration actions and institutional controls,

(2) Document all actions and institutional controls in the Installation Master Plan, Base Maps, and Fact Sheets and distribute to affected, units, organizations, and tenants, at the point they are affected on annual basis.

(3) Ensure that all affected tenants and organizations are informed of:

(a) Known soil and ground water contamination in their areas of operation;

(b) Institutional controls associated with remedial activities;

(c) Potential human health risks and environmental impacts associated with violating the controls;

(d) Potential fines, penalties, and criminal implications resulting from violations of the institutional controls.

(4) Provide oversight and review of all Work Clearance Requests to ensure that all activities that involve disturbance of soil or use of groundwater comply with current environmental laws.

(5) Ensure all affected contracting mechanisms i.e., job order contract, military construction, in-house projects, etc. are modified to include the appropriate environmental information to prevent a violation of

Institutional Controls and the potential fines, penalties, and criminal implications resulting from violations of the institutional controls.

USARAK Form 81-E (Excavation Clearance Request) must be appropriately annotated by DPW-Environmental to prevent the undertaking of work inconsistent with established institutional controls at a particular site. If a dispute with a subordinate activity or tenant arises due to DPW-Environmental non-concurrence on Form 81-E with proposed site work because of the potential for an institutional controls violation, the Commander's Policy Memorandum on Institutional Controls shall provide the basis for final resolution.

c. Directorate of Logistics shall determine the necessary protocols and language to be incorporated into their contract mechanisms to inform potential contractors of the environmental status of USARAK Installations regarding contamination. Such language or protocols will emphasize:

(1) The need for contractors to coordinate with USARAK environmental personnel prior to conducting any soil disturbing activities anywhere on USARAK controlled lands; and

(2) Potential fines, penalties, and criminal implications resulting from violations of the institutional controls,

d. Directorate of Contracting shall determine the necessary protocols and language to be incorporated into their contract mechanisms to inform potential contractors of the environmental status of USARAK Installations regarding contamination. Such language or protocols will emphasize:

(1) The need for contractors to coordinate with environmental personnel prior to conducting any soil disturbing activities or gaining access to fenced or restricted areas associated with institutional controls anywhere on USARAK controlled lands; and

(2) Potential fines, penalties, and criminal implications resulting from violations of the institutional controls,

e. Directorate of Plans, Training, Security, and Mobilization (DPTSM) shall:

(1) Provide all troop units utilizing the training areas information regarding known and potential sources of contamination in the training areas;

(2) Provide information regarding Institutional Controls and the potential fines, penalties, and criminal implications resulting from violations of the institutional controls;

(3) Provide (through DPW Environmental) maps and related information regarding USARAK sites with institutional controls;

(4) Attend Institutional Controls status update meetings as required by the Installation Commander.

f. U.S. Army Corps of Engineers, Alaska District shall ensure that all contract mechanisms incorporate a complete section that provides a detailed explanation of the following information:

(1) The environmental status of the installation in question and the existence of institutional controls and the potential fines, penalties, and criminal implications resulting from violations of the institutional controls,

(2) The requirements for obtaining work clearance request prior to performing any type of excavation, trenching, or disturbance of soil,

(3) The notification requirements for reporting spills,previously unknown soil or ground water contamination, and

(4) How to dispose of hazardous and non-hazardous wastes, contaminated soil and ground water etc. from USARAK controlled lands.

g. All DOD Personnel responsible for initiating DA Form 4283, Work Request, are required to become familiar with the institutional controls within the immediate work area.

h. Civilian Tenant Organizations shall coordinate all work involving the disturbance of soil or installation of a well anywhere on USARAK-controlled lands with the Directorate of Public Works and obtain proper authorization prior to the commencement of work.

i. Defense Reutilization Management Office shall dispose of all investigation derived waste in accordance with the appropriate laws and regulations.

5. The following procedures are applicable to all personnel working in areas where institutional controls are in place:

a. If soil or groundwater must be removed from the work site, it shall be:

(1) Containerized in United Nations approved, Performance Oriented Packaging (UN/POP) containers as specified in 49 CFR 178.500, Specifications and Maintenance of Packaging;

(2) Labeled as non-regulated waste, sampled and analyzed for potential contamination; and

(3) Moved to an approved storage area. The area shall be approved by the Public Works Environmental Office prior to usage.

NOTE: Soil and groundwater shall not be removed from any part of the installation without written authorization from an authorized USARAK representative. All operations involving hazardous waste will be accomplished in accordance with USARAK Regulation 200-4, *Environmental Quality: Hazardous Waste, Used Oil and Hazardous Materials Management.*

b. If contaminated soils, drums, unexploded ordnance or unusual debris are found on or around any work site, the agency shall stop work immediately and notify the Installation's Public Works Environmental Office (and Range Control Officer if unexploded ordnance is involved). Work at this site will be suspended until the area is cleared by the Environmental Office (Range Control if unexploded ordnance is involved).

-- END OF SECTION --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01180

RADIOACTIVE MATERIALS PROCEDURES

PART 1 GENERAL

1.1 SCOPE
1.2 REFERENCES
1.3 REQUIREMENTS
1.3.1 Standards
1.3.2 Permit
1.4 INITIAL NOTIFICATION
1.5 COMPLETE NOTIFICATION
1.6 VIOLATIONS
1.7 ACCIDENTS

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

-- End of Section Table of Contents --

SECTION 01180

RADIOACTIVE MATERIALS PROCEDURES

PART 1 GENERAL

1.1 SCOPE

This section covers the use of items containing radioactive substances, such as soil density measuring devices, on military property or installations.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. ARMY (DA)

AR 11-9 (1999) The Army Radiation Safety Program

1.3 REQUIREMENTS

Use of radioactive material on military property or installations shall conform to the following requirements.

1.3.1 Standards

The Contractor shall comply with AR 11-9.

1.3.2 Permit

Department of the Army (DA) radiation permits are required for use, storage, possession, and disposal of radiation sources by non-Army agencies (including civilian contractors), except a DA permit is not required for temporary use or storage (less than 15 consecutive calendar days) if the local commander determines that adequate safety exists. Concurrence of the Installation Commander and Headquarters, Department of the Army is required to obtain a DA permit. The Contractor shall submit six (6) copies of a completed DA Form 3337, through the Contracting Officer, to the Installation Commander, at least 60 days prior to desired start date or date of arrival of the source, whichever is sooner. The Commander will forward copies to the approving authority for appropriate action.

a. Even if Nuclear Regulatory Commission (NRC) license already permits use or storage of radioactive sources at unspecified Army installations, the Contractor still needs a DA permit.

b. Local Commanders may approve temporary use or storage of sealed radioactive sources by users with a proper NRC license, or Agreement State license.

c. In all cases, the Contractor shall restore the property to NRC

unrestricted use criteria.

1.4 INITIAL NOTIFICATION

Once the Contractor has received written approval for use of the radioactive material through the Contracting Officer, the radioactive material may be brought onto the installation. The Contractor shall notify the Installation Commander immediately upon bringing the material onto the installation, and again 3 working days prior to the initial use of the materials.

1.5 COMPLETE NOTIFICATION

The Contractor shall notify the Installation Commander immediately upon completion of use, and when the material is removed from the installation.

1.6 VIOLATIONS

The Contractor will be subject to inspection by the Contracting Officer, the Installation Commander, and Federal and State agencies or their designated representatives at all times when the materials are on the installation. Any violations of the conditions of the approval, or of applicable regulations, will require immediate cessation of work until the cause is corrected, and written approval for re-start of work is received by the Contracting Officer from the Installation Commander. All delays, down time, etc. incurred as a result of such cessation of work shall be at the Contractor's expense.

1.7 ACCIDENTS

Accidents or incidents involving the radioactive material, and any known or potential exposure of Contractor or non-Contractor personnel to radiation, shall be reported immediately to the Installation Commander and the Contracting Officer, and operations suspended until the circumstances have been evaluated by the Installation Commander, and approval for the re-start has been received by the Contracting Officer.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01271

MEASUREMENT, PAYMENT, AND CONTRACT COST BREAKDOWN

PART 1 GENERAL

1.1 MEASUREMENT
1.1.1 Lump Sum
1.2 PAYMENT

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 CONTRACT COST BREAKDOWN

-- End of Section Table of Contents --

SECTION 01271

MEASUREMENT, PAYMENT, AND CONTRACT COST BREAKDOWN

PART 1 GENERAL

1.1 MEASUREMENT

1.1.1 Lump Sum

Each lump sum item will be measured for payment as a complete item.

1.2 PAYMENT

Payment will be made at the contract unit price. The price for each item shall constitute full compensation for furnishing all labor, equipment, and materials, and performing all operations necessary to construct and complete the work in accordance with the specifications and drawings. Payment shall be considered as full compensation, notwithstanding that minor features of the work to complete the item may not be mentioned. Work paid for under one item will not be paid for under any other item.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 CONTRACT COST BREAKDOWN

The Contractor shall furnish within 30 days after the date of Notice to Proceed, and prior to the submission of its first partial payment estimate, a breakdown of its lump-sum pay item or items which will be reviewed by the Contracting Officer as to propriety of distribution of the total cost to the various accounts. Any unbalanced items as between early and late payment items or other discrepancies will be revised by the Contracting Officer to agree with a reasonable cost of the work included in the various items. This contract cost breakdown will then be utilized as the basis for progress payments to the Contractor.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01312

QUALITY CONTROL SYSTEM (QCS)

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS
1.1.1 Correspondence and Electronic Communications
1.1.2 Other Factors
1.2 QCS SOFTWARE
1.3 SYSTEM REQUIREMENTS
1.4 RELATED INFORMATION
1.4.1 QCS User Guide
1.4.2 Contractor Quality Control(CQC) Training
1.5 CONTRACT DATABASE
1.6 DATABASE MAINTENANCE
1.6.1 Administration
1.6.1.1 Contractor Information
1.6.1.2 Subcontractor Information
1.6.1.3 Correspondence
1.6.1.4 Equipment
1.6.1.5 Management Reporting
1.6.2 Finances
1.6.2.1 Pay Activity Data
1.6.2.2 Payment Requests
1.6.3 Quality Control (QC)
1.6.3.1 Daily Contractor Quality Control (CQC) Reports.
1.6.3.2 Deficiency Tracking.
1.6.3.3 Three-Phase Control Meetings
1.6.3.4 Accident/Safety Tracking.
1.6.3.5 Features of Work
1.6.3.6 QC Requirements
1.6.4 Submittal Management
1.6.5 Schedule
1.6.6 Import/Export of Data
1.7 IMPLEMENTATION
1.8 DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM
1.8.1 File Medium
1.8.2 Disk or CD-ROM Labels
1.8.3 File Names
1.9 MONTHLY COORDINATION MEETING
1.10 NOTIFICATION OF NONCOMPLIANCE

-- End of Section Table of Contents --

SECTION 01312

QUALITY CONTROL SYSTEM (QCS)

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

The Government will use the Resident Management System for Windows (RMS) to assist in its monitoring and administration of this contract. The Contractor shall use the Government-furnished Construction Contractor Module of RMS, referred to as QCS, to record, maintain, and submit various information throughout the contract period. This joint Government-Contractor use of RMS and QCS will facilitate electronic exchange of information and overall management of the contract. QCS provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

Administration

Finances

Quality Control

Submittal Monitoring

Scheduling

Import/Export of Data

1.1.1 Correspondence and Electronic Communications

For ease and speed of communications, both Government and Contractor will, to the maximum extent feasible, exchange correspondence and other documents in electronic format. Correspondence, pay requests and other documents comprising the official contract record shall also be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

1.1.2 Other Factors

Particular attention is directed to Contract Clause, "Schedules for Construction Contracts", Contract Clause, "Payments", SECTION 01320, PROJECT SCHEDULE, SECTION 01330, SUBMITTAL PROCEDURES, and SECTION 01451, CONTRACTOR QUALITY CONTROL, which have a direct relationship to the reporting to be accomplished through QCS. Also, there is no separate payment for establishing and maintaining the QCS database; all costs associated therewith shall be included in the contract pricing for the work.

1.2 QCS SOFTWARE

QCS is a Windows-based program that can be run on a stand-alone personal

computer or on a network. The Government will make available the QCS software to the Contractor after award of the construction contract. Prior to the Pre-Construction Conference, the Contractor shall be responsible to download, install and use the latest version of the QCS software from the Government's RMS Internet Website. Upon specific justification and request by the Contractor, the Government can provide QCS on 3-1/2 inch high-density diskettes or CD-ROM. Any program updates of QCS will be made available to the Contractor via the Government RMS Website as they become available.

1.3 SYSTEM REQUIREMENTS

The following listed hardware and software is the minimum system configuration that the Contractor shall have to run QCS:

Hardware

IBM-compatible PC with 800 MHz Pentium or higher processor

256+ MB RAM for workstation / 256+ MB RAM for server

1 GB hard drive disk space for sole use by the QCS system

3-1/2 inch high-density floppy drive

Compact disk (CD) Reader, 8x speed or higher

SVGA or higher resolution monitor (1024 x 768, 256 colors)

Mouse or other pointing device

Windows compatible printer (Laser printer must have 4+ MB of RAM)

Connection to the Internet, minimum 56 Kbps

Software

MS Windows 98, 2000, or XP

Word Processing software compatible with MS Word 2000 or newer

Latest version of: Netscape Navigator, Microsoft Internet Explorer, or other browser that supports HTML 4.0 or higher

Virus protection software that is regularly upgraded with all issued manufacturer's updates

Electronic mail (E-mail), MAPI compatible

1.4 RELATED INFORMATION

1.4.1 QCS User Guide

After contract award, the Contractor shall download instructions for the installation and use of QCS from the Government RMS Internet Website; the Contractor can obtain the current address from the Government. In case of justifiable difficulties, the Government will provide the Contractor with a CD-ROM containing these instructions.

1.4.2 Contractor Quality Control(CQC) Training

The use of QCS will be discussed with the Contractor's QC System Manager during the mandatory CQC Training class.

1.5 CONTRACT DATABASE

Prior to the pre-construction conference, the Government shall provide the Contractor with basic contract award data to use for QCS. The Government will provide data updates to the Contractor as needed, generally by files attached to E-mail. These updates will generally consist of submittal reviews, correspondence status, QA comments, and other administrative and QA data.

1.6 DATABASE MAINTENANCE

The Contractor shall establish, maintain, and update data for the contract in the QCS database throughout the duration of the contract. The Contractor shall establish and maintain the QCS database at the Contractor's site office. Data updates to the Government shall be submitted by E-mail with file attachments, e.g., daily reports, schedule updates, payment requests. If permitted by the Contracting Officer, a data diskette or CD-ROM may be used instead of E-mail (see Paragraph DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM). The QCS database typically shall include current data on the following items:

1.6.1 Administration

1.6.1.1 Contractor Information

The database shall contain the Contractor's name, address, telephone numbers, management staff, and other required items. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver Contractor administrative data in electronic format via E-mail.

1.6.1.2 Subcontractor Information

The database shall contain the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor must be listed separately for each trade to be performed. Each subcontractor/trade shall be assigned a unique Responsibility Code, provided in QCS. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver subcontractor administrative data in electronic format via E-mail.

1.6.1.3 Correspondence

All Contractor correspondence to the Government shall be identified with a serial number. Correspondence initiated by the Contractor's site office shall be prefixed with "S". Letters initiated by the Contractor's home (main) office shall be prefixed with "H". Letters shall be numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C".

1.6.1.4 Equipment

The Contractor's QCS database shall contain a current list of equipment planned for use or being used on the jobsite, including the most recent

and planned equipment inspection dates.

1.6.1.5 Management Reporting

QCS includes a number of reports that Contractor management can use to track the status of the project. The value of these reports is reflective of the quality of the data input, and is maintained in the various sections of QCS. Among these reports are: Progress Payment Request worksheet, QA/QC comments, Submittal Register Status, Three-Phase Inspection checklists.

1.6.2 Finances

1.6.2.1 Pay Activity Data

The QCS database shall include a list of pay activities that the Contractor shall develop in conjunction with the construction schedule. The sum of all pay activities shall be equal to the total contract amount, including modifications. Pay activities shall be grouped by Contract Line Item Number (CLIN), and the sum of the activities shall equal the amount of each CLIN. The total of all CLINs equals the Contract Amount.

1.6.2.2 Payment Requests

All progress payment requests shall be prepared using QCS. The Contractor shall complete the payment request worksheet and include it with the payment request. The work completed under the contract, measured as percent or as specific quantities, shall be updated at least monthly. After the update, the Contractor shall generate a payment request report using QCS. The Contractor shall submit the payment requests with supporting data by E-mail with file attachment(s). If permitted by the Contracting Officer, a data diskette may be used instead of E-mail. A signed paper copy of the approved payment request is also required, which shall govern in the event of discrepancy with the electronic version.

1.6.3 Quality Control (QC)

QCS provides a means to track implementation of the 3-phase QC Control System, prepare daily reports, identify and track deficiencies, document progress of work, and support other contractor QC requirements. The Contractor shall maintain this data on a daily basis. Entered data will automatically output to the QCS generated daily report. The Contractor shall provide the Government a Contractor Quality Control (CQC) Plan within the time required in SECTION 01451 CONTRACTOR QUALITY CONTROL. Within seven calendar days of Government acceptance, the Contractor shall submit a data diskette or CD-ROM reflecting the information contained in the accepted CQC Plan: schedule, pay activities, features of work, submittal register, QC requirements, and equipment list.

1.6.3.1 Daily Contractor Quality Control (CQC) Reports.

QCS includes the means to produce the Daily CQC Report. The Contractor may use other formats to record basic QC data. However, the Daily CQC Report generated by QCS shall be the Contractor's official report. Data from any supplemental reports by the Contractor shall be summarized and consolidated onto the QCS-generated Daily CQC Report. Daily CQC Reports shall be submitted as required by SECTION 01451 CONTRACTOR QUALITY

CONTROL. Reports shall be submitted electronically to the Government using E-mail or diskette within 24 hours after the date covered by the report. Use of either mode of submittal shall be coordinated with the Government representative. The Contractor shall also provide the Government a signed, printed copy of the daily CQC report.

1.6.3.2 Deficiency Tracking.

The Contractor shall use QCS to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using QC punch list items. The Contractor shall maintain a current log of its QC punch list items in the QCS database. The Government will log the deficiencies it has identified using its QA punch list items. The Government's QA punch list items will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of both QC and QA punch list items.

1.6.3.3 Three-Phase Control Meetings

The Contractor shall maintain scheduled and actual dates and times of preparatory and initial control meetings in QCS.

1.6.3.4 Accident/Safety Tracking.

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of the safety comments. In addition, the Contractor shall utilize QCS to advise the Government of any accidents occurring on the jobsite. This brief supplemental entry is not to be considered as a substitute for completion of mandatory reports, e.g., ENG Form 3394 and OSHA Form 200.

1.6.3.5 Features of Work

The Contractor shall include a complete list of the features of work in the QCS database. A feature of work may be associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of paragraph "Finances") will only be linked to a single feature of work.

1.6.3.6 QC Requirements

The Contractor shall develop and maintain a complete list of QC testing, transferred and installed property, and user training requirements in QCS. The Contractor shall update all data on these QC requirements as work progresses, and shall promptly provide this information to the Government via QCS.

1.6.4 Submittal Management

The Contractor shall create the initial submittal register, ENG Form 4288, SUBMITTAL REGISTER, in electronic format. Thereafter, the Contractor shall maintain a complete list of all submittals, including completion of all data columns. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. The Contractor shall use QCS to track and transmit all submittals. ENG Form 4025, submittal transmittal form, and the submittal register update, ENG Form 4288, shall be produced using QCS.

RMS will be used to update, store and exchange submittal registers and transmittals, but will not be used for storage of actual submittals.

1.6.5 Schedule

The Contractor shall develop a construction schedule consisting of pay activities, in accordance with Contract Clause "Schedules for Construction Contracts", or SECTION 01320, PROJECT SCHEDULE, as applicable. This schedule shall be input and maintained in the QCS database either manually or by using the Standard Data Exchange Format (SDEF) (see SECTION 01320 PROJECT SCHEDULE). The updated schedule data shall be included with each pay request submitted by the Contractor.

1.6.6 Import/Export of Data

QCS includes the ability to export Contractor data to the Government and to import submittal register and other Government-provided data, and schedule data using SDEF.

1.7 IMPLEMENTATION

Contractor use of QCS as described in the preceding paragraphs is mandatory. The Contractor shall ensure that sufficient resources are available to maintain its QCS database, and to provide the Government with regular database updates. QCS shall be an integral part of the Contractor's management of quality control.

1.8 DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM

The Government-preferred method for Contractor's submission of updates, payment requests, correspondence and other data is by E-mail with file attachment(s). For locations where this is not feasible, the Contracting Officer may permit use of computer diskettes or CD-ROM for data transfer. Data on the disks or CDs shall be exported using the QCS built-in export function. If used, diskettes and CD-ROMs will be submitted in accordance with the following:

1.8.1 File Medium

The Contractor shall submit required data on 3-1/2 inch double-sided high-density diskettes formatted to hold 1.44 MB of data, capable of running under Microsoft Windows 98, 2000 or XP. Alternatively, CD-ROMs may be used. They shall conform to industry standards used in the United States. All data shall be provided in English.

1.8.2 Disk or CD-ROM Labels

The Contractor shall affix a permanent exterior label to each diskette and CD-ROM submitted. The label shall indicate in English, the QCS file name, full contract number, contract name, project location, data date, name and telephone number of person responsible for the data.

1.8.3 File Names

The Government will provide the file names to be used by the Contractor with the QCS software.

1.9 MONTHLY COORDINATION MEETING

The Contractor shall update the QCS database each workday. At least monthly, the Contractor shall generate and submit an export file to the Government with schedule update and progress payment request. As required in Contract Clause "Payments", at least one week prior to submittal, the Contractor shall meet with the Government representative to review the planned progress payment data submission for errors and omissions.
The Contractor shall make all required corrections prior to Government acceptance of the export file and progress payment request. Payment requests accompanied by incomplete or incorrect data submittals will be returned. The Government will not process progress payments until an acceptable QCS export file is received.

1.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01320

PROJECT SCHEDULE

PART 1 GENERAL

1.1 REFERENCES
1.2 QUALIFICATIONS

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS
3.2 BASIS FOR PAYMENT
3.3 PROJECT SCHEDULE
3.3.1 Use of the Critical Path Method
3.3.2 Level of Detail Required
3.3.2.1 Activity Durations
3.3.2.2 Procurement Activities
3.3.2.3 Critical Activities
3.3.2.4 Government Activities
3.3.2.5 Responsibility
3.3.2.6 Work Areas
3.3.2.7 Modification or Claim Number
3.3.2.8 Bid Item
3.3.2.9 Phase of Work
3.3.2.10 Category of Work
3.3.2.11 Feature of Work
3.3.3 Scheduled Project Completion
3.3.3.1 Project Start Date
3.3.3.2 Constraint of Last Activity
3.3.3.3 Early Project Completion
3.3.4 Interim Completion Dates
3.3.4.1 Start Phase
3.3.4.2 End Phase
3.3.4.3 Phase X
3.3.5 Default Progress Data Disallowed
3.3.6 Out-of-Sequence Progress
3.3.7 Negative Lags
3.4 PROJECT SCHEDULE SUBMISSIONS
3.4.1 Preliminary Project Schedule Submission
3.4.2 Initial Project Schedule Submission
3.4.3 Periodic Schedule Updates
3.4.4 Standard Activity Coding Dictionary
3.5 SUBMISSION REQUIREMENTS
3.5.1 Data Disks
3.5.1.1 File Medium
3.5.1.2 Disk Label

3.5.1.3 File Name
3.5.2 Narrative Report
3.5.3 Approved Changes Verification
3.5.4 Schedule Reports
3.5.4.1 Activity Report
3.5.4.2 Logic Report
3.5.4.3 Total Float Report
3.5.4.4 Earnings Report
3.5.5 Network Diagram
3.5.5.1 Continuous Flow
3.5.5.2 Project Milestone Dates
3.5.5.3 Critical Path
3.5.5.4 Banding
3.5.5.5 S-Curves
3.6 PERIODIC PROGRESS MEETINGS
3.6.1 Meeting Attendance
3.6.2 Update Submission Following Progress Meeting
3.6.3 Progress Meeting Contents
3.6.3.1 Start and Finish Dates
3.6.3.2 Time Completion
3.6.3.3 Cost Completion
3.6.3.4 Logic Changes
3.6.3.5 Other Changes
3.7 REQUESTS FOR TIME EXTENSIONS
3.7.1 Justification of Delay
3.7.2 Submission Requirements
3.7.3 Additional Submission Requirements
3.8 DIRECTED CHANGES
3.9 OWNERSHIP OF FLOAT
3.10 ATTACHMENT

-- End of Section Table of Contents --

SECTION 01320

PROJECT SCHEDULE

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of the specification to the extent referenced. The publications are referenced in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1-1-11	(1995) Progress, Schedules, and Network Analysis Systems

1.2 QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS, a Project Schedule as described below shall be prepared. The scheduling of construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

3.2 BASIS FOR PAYMENT

The schedule shall be the basis for measuring Contractor progress. Lack of an approved schedule or scheduling personnel will result in an inability of the Contracting Officer to evaluate Contractor's progress for the purposes of payment. Failure of the Contractor to provide all information, as specified below, shall result in the disapproval of the entire Project Schedule submission and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the Contracting Officer and those revisions have not been included in the Project Schedule, the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification. Failure of the Contractor to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the Contracting Officer.

3.3.1 Use of the Critical Path Method

The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in the Precedence Diagram Method (PDM).

3.3.2 Level of Detail Required

The Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the Contracting Officer at the appropriate level of detail, as specified by the Contracting Officer, shall result in the disapproval of the schedule. The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule:

3.3.2.1 Activity Durations

Contractor submissions shall follow the direction of the Contracting Officer regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods (usually less than 2 percent of all non-procurement activities' Original Durations are greater than 20 days).

3.3.2.2 Procurement Activities

Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, and delivery.

3.3.2.3 Critical Activities

The following activities shall be listed as separate line activities on the Contractor's project schedule:

a. Submission and approval of mechanical/electrical layout drawings.

b. Submission and approval of O & M manuals.

c. Submission and approval of as-built drawings.

d. Submission and approval of 1354 data and installed equipment lists.

e. Submission of TAB specialist design review report.

f. Air and water balance dates.

g. Performance Verification testing.

h. Other systems testing, if required.

i. Prefinal inspection.

j. Correction of punchlist from prefinal inspection.

k. Final inspection.

3.3.2.4 Government Activities

Government and other agency activities that could impact progress shall be shown. These activities include, but are not limited to: approvals, inspections, utility tie-in, and Notice to Proceed (NTP) for phasing requirements.

3.3.2.5 Responsibility

All activities shall be identified in the project schedule by the party responsible to perform the work. Responsibility includes, but is not limited to, the subcontracting firm, contractor work force, or government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.

3.3.2.6 Work Areas

All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code.

3.3.2.7 Modification or Claim Number

Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a mod or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Mod or Claim Number. Whenever possible, changes shall be added to the schedule by adding new activities. Existing activities shall not normally be changed to reflect modifications.

3.3.2.8 Bid Item

All activities shall be identified in the project schedule by the Bid Item to which the activity belongs. An activity shall not contain work in more than one bid item. The bid item for each appropriate activity shall be identified by the bid Item Code.

3.3.2.9 Phase of Work

All activities shall be identified in the project schedule by the phases of work in which the activity occurs. Activities shall not contain work in more than one phase of work. The project phase of each activity shall be by the unique Phase of Work Code.

3.3.2.10 Category of Work

All Activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited, to the procurement chain of activities including such items as submittals approvals, procurement, fabrication, delivery, installation, start-up, and testing. The category of work for each activity shall be identified by the Category of Work Code.

3.3.2.11 Feature of Work

All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to, a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code.

3.3.3 Scheduled Project Completion

The schedule interval shall extend from NTP to the contract completion date.

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date on which the NTP was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called "Start Project". The "Start Project" activity shall have an "ES" constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.3.2 Constraint of Last Activity

Completion of the last activity in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity called "End Project". The "End Project" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.3.3 Early Project Completion

In the event the project schedule shows completion of the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. Contractor shall specifically address each of the activities noted in the narrative report at every project schedule update period to assist the Contracting Officer in evaluating the Contractor's ability to actually complete prior to the contract period.

3.3.4 Interim Completion Dates

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.4.1 Start Phase

The Contractor shall include as the first activity for a project phase

an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have an "ES" constraint date equal to the date on which the NTP was acknowledged, and a zero day duration.

3.3.4.2 End Phase

The Contractor shall include as the last activity in a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.4.3 Phase X

The Contractor shall include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" activity shall be logically tied to the earliest and latest activities in the phase.

3.3.5 Default Progress Data Disallowed

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control report for every in-progress or completed activity, and failure to ensure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Program features which calculate one of these parameters from the other shall be disabled.

3.3.6 Out-of-Sequence Progress

Activities that have posted progress without all preceding logic being satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case approval of the Contracting Officer. The Contractor shall propose logic corrections to eliminate all out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule.

3.3.7 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.

3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1 Preliminary Project Schedule Submission

The Preliminary Project Schedule, defining the Contractor's planned operations for the first 60 calendar days shall be submitted for

approval within 20 calendar days after the NTP is acknowledged. The approved preliminary schedule shall be used for payment purposes not to exceed 60 calendar days after NTP.

3.4.2 Initial Project Schedule Submission

The Initial Project Schedule shall be submitted for approval within 40 calendar days after NTP. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail.

3.4.3 Periodic Schedule Updates

Based on the result of progress meetings, specified in "Periodic Progress Meetings," the Contractor shall submit periodic schedule updates. These submissions shall enable the Contracting Officer to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgement of the Contracting Officer or authorized representative is necessary for verifying the Contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.4.4 Standard Activity Coding Dictionary

The Contractor shall use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11, Appendix A. This exact structure is mandatory, even if some fields are not used.

3.5 SUBMISSION REQUIREMENTS

The following items shall be submitted by the Contractor for the preliminary submission, initial submission, and every periodic project schedule update throughout the life of the project:

3.5.1 Data Disks

Two data disks containing the project schedule shall be provided. Data on the disks shall adhere to the SDEF format specified in ER 1-1-11, Appendix A.

3.5.1.1 File Medium

Required data shall be submitted on 3.5 in disks, formatted to hold 1.44 MB of data, under the MS-DOS Version 5. or 6.x, unless otherwise approved by the Contracting Officer.

3.5.1.2 Disk Label

A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Preliminary, Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number or person responsible for the schedule, and the MS-DOS version used to format the disk.

3.5.1.3 File Name

Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall

develop a naming convention that will ensure that the names of the files submitted are unique. The Contractor shall submit the file naming convention to the Contracting Officer for approval.

3.5.2 Narrative Report

A Narrative Report shall be provided with the preliminary, initial, and each update of the project schedule. This report shall be provided as the basis of the Contractor's progress payment request. The Narrative Report shall include: a description of activities along the 2 most critical paths, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken. The narrative report is expected to relay to the Government, the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis.

3.5.3 Approved Changes Verification

Only project schedule changes that have been previously approved by the Contracting Officer shall be included in the schedule submission. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float. Actual Start and Actual Finish Dates shall be printed for those activities in progress or completed.

3.5.4.1 Activity Report

A list of all activities sorted according to activity number.

3.5.4.2 Logic Report

A list of Preceding and Succeeding activities for every activity in ascending order by activity number. Preceeding and succeeding activities shall include all information listed above in paragraph Schedule Reports. A blank line shall be left between each activity grouping.

3.5.4.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates. Completed activities shall not be shown on this report.

3.5.4.4 Earnings Report

A compilation of the Contractor's Total Earnings on the project from the NTP until the most recent Monthly Progress Meeting. This report shall reflect the Earnings of specific activities based on the agreements made in the field and approved between the Contractor and Contracting Officer at the most recent Monthly Progress Meeting. Provided that the

Contractor has provided a complete schedule update, this report shall serve as the basis of determining Contractor Payment. Activities shall be grouped by bid item and sorted by activity numbers. This report shall: sum all activities in a bid item and provide a bid item percent; and complete and sum all bid items to provide a total project percent complete. The printed report shall contain, for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), and Earnings to Date.

3.5.5 Network Diagram

The network diagram shall be required on the initial schedule submission and on monthly schedule update submissions. The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left. The activity number, description, duration, and estimated earned value shall be shown on the diagram.

3.5.5.2 Project Milestone Dates

Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

The critical path shall be clearly shown.

3.5.5.4 Banding

Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a monthly onsite meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor shall describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer will approve activity progress, proposed revisions, and adjustments as appropriate.

3.6.1 Meeting Attendance

The Contractor's Project Manager and Scheduler shall attend the regular progress meeting.

3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after the monthly progress meeting.

3.6.3 Progress Meeting Contents

Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost-to-Date shall be subject to the approval of the Contracting Officer. As a minimum, the Contractor shall address the following items on an activity by activity basis during each progress meeting.

3.6.3.1 Start and Finish Dates

The Actual Start and Actual Finish dates for each activity currently in-progress or completed .

3.6.3.2 Time Completion

The estimated Remaining Duration for each activity in-progress. Time-based progress calculations shall be based on Remaining Duration for each activity.

3.6.3.3 Cost Completion

The earnings for each activity started. Payment will be based on earnings for each in-progress or completed activity. Payment for individual activities will not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

3.6.3.4 Logic Changes

All logic changes pertaining to NTP on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, lag durations, and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

3.6.3.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities include: 1) delays beyond the Contractor's control, such as strikes and unusual weather. 2) delays encountered due to submittals, Government Activities, deliveries or work stoppages which make re-planning the work necessary. 3) Changes required to correct a schedule which does not represent the actual or planned prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor requests an extension of the contract completion date, or any interim milestone date, the Contractor shall furnish the following for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of

the contract: justification, project schedule data, and supporting evidence as the Contracting Officer may deem necessary. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals.

3.7.1 Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, will not be a cause for a time extension to the contract completion date.

3.7.2 Submission Requirements

The Contractor shall submit a justification for each request for a change in the contract completion date of under 2 weeks based upon the most recent schedule update at the time of the NTP or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

a. A list of affected activities, with their associated project schedule activity number.

b. A brief explanation of the causes of the change.

c. An analysis of the overall impact of the changes proposed.

d. A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

3.7.3 Additional Submission Requirements

For any requested time extension of over 2 weeks, the Contracting Officer may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If the NTP is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the Contracting Officer within 2 weeks of the NTP being issued. The proposed revisions to the schedule will be approved by the Contracting Officer prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, the Contractor shall advise the Contracting Officer within 2 weeks of receipt of the

revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

3.10 ATTACHMENT

Standard Data Exchange Format Specification (Appendix A)

STANDARD DATA EXCHANGE FORMAT SPECIFICATION

PART 1- GENERAL

1. Application of This Provision: The Standard Data Exchange Format (SDEF) provides a non-proprietary protocol to exchange project planning and progress data between scheduling systems.

2. File Type and Format: The data file shall consist of a 132 character, freed format, "ASCII" file. Text shall be left-justified and numbers shall be right-justified in each field. Data records must conform, exactly, to the sequence, column position, maximum length, mandatory values, and field definitions described below to comply with the SDEF. Unless specifically stated, all numbers shall be whole numbers. Fields containing numbers shall not be zero filled. All data columns shall be separated by a single blank column. The file shall not contain blank lines.

3. Usage Notes: Where appropriate, notes regarding proper usage of systems to support the SDEF have been included in brackets ([ ]). These notes are included to assist users in creating SDEF-compatible files, given the variety of software systems that support the SDEF.

4. Recommended Systems: Several systems have been tested to determine the accuracy of importing and exporting SDEF files. For information on the current list of recommended systems, please contact Mr. Stan Green at HQUSACE, (202) 761-0206. Although the currently listed system have been tested other systems may also be acceptable provided those systems correctly import and export SDEF files.

5. SDEF Checker Program: A program that checks whether a file meets the SDEF is available free of charge. A copy of this program may be obtained by written request to: U.S. Army Corps of Engineers, ATTN: Mr. Bill East (CECER-FFA), P.O. Box 9005, Champaign, IL 61826-90005. A description of the SDEF Checker is also available on the Internet and CivilNet.

PART 2- SDEF SPECIFICATION

6. SDEF Organization: The SDEF shall consist of the following records provided in the exact sequence shown below:

ER 1-1-11
15 Jun 95

Paragraph Reference	Record Description	Remarks
6.a	Volume Record	Mandatory First Line of File
6.b	Project Record	Mandatory Second Line of File
6.c	Calendar Record(s)	Mandatory One Record Minimum
6.d	Holiday Record(s)	Mandatory if Holidays Used
6.e	Activity Record(s)	Mandatory Records
6.f	Precedence Record(s)	Mandatory for Precedence
6.g	Unit Cost Record(s)	Mandatory for Unit Costs
6.h	Progress Record(s)	Mandatory Records
6.i	File End Record	Mandatory Last Line of Disk/File

6.a. Volume Record: The Volume Record shall be used to control the transfer of data that may not fit on a single disk. The first line in every file used to store SDEF data shall be the Volume Record. The Volume Record shall sequentially identify the number of the data transfer disk(s). The Volume Record shall have the following format:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1 - 4	4	VOLM	Fixed	Filled
DISK NUMBER	6 - 7	2	√	Number	Right Justified

6.a.(l) The RECORD IDENTIFIER is the first four characters of this record. The required value for this field shall be "VOLM". The VOLM record must appear on the first line of the SDEF data file.

6.a.(2) The DISK NUMBER field shall identify the number of the data disk used to store the data exchange information. If all data may be contained on a single disk, this field shall contain the value of "l". If more disks are required, then the second disk shall contain the value "2", the third disk shall be designated with a "3", and so on. Identifcation of the last data disk is accomplished in the Reject End Record.

6.b. Project Record: The Project Identifier Record shall contain general project information. Because more than one SDEF file may be required for data transfer between large projects, the PROJ record shall be the second line of the first SDEF file transferred. The PROJ record shall contain information in the following format:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1- 4	4	PROJ	Fixed	Filled
DATA DATE	6- 12	7	√	ddmmmyy	Filled
PROJECT IDENTIFIER	14-17	4	√	Alpha.	Left Justified
PROJECT NAME	19-66	48	√	Alpha.	Left Justified
CONTRACTOR NAME	68-103	36	√	Alpha.	Left Justified
ARROW OR PRECEDENCE	105-105	1	A,P	Fixed	Filled
CONTRACT NUMBER	107-112	6	√	Alpha.	Left Justified
PROJECT START	114-120	7	√	ddmmmyy	Filled
PROJECT END	122-128	7	√	ddmmmyy	Filled

6.b.(1) The RECORD IDENTIFIER is the first four characters of this record. The required value for this field shall be "PROJ". This record shall contain the general project information and indicates which scheduling method shall be used.

6.b.(2) The DATA DATE is the date of the schedule calculation. The abbreviation "ddmmmyy" refers to a date format that shall translate a date into two numbers for the day, three letters for the month, and two numbers for the year. For example, March 1, 1999 shall be translated into OlMar99. This same convention for date formats shall be used throughout the entire data format. To ensure that dates are translated consistently, the following abbreviations shall be used for the three character month code:

Abbreviation	Month
JAN	January
FEB	February
MAR	March
APR	April
MAY	May
JUN	June
JUL	July
AUG	August
SEP	September
OCT	October
NOV	November
DEC	December

6.b.(3) The PROJECT IDENTIFIER is a maximum four character abbreviation for the schedule. These four characters shall be used to uniquely identify the project and specific update as agreed upon by Contractor and Contracting Officer. When utilizing scheduling software these four characters shall be used to select the project. Software manufacturers shall provide information to users to ensure that data importing programs do not automatically overwrite other schedules with the same PROJECT IDENTIFIER.

6.b.(4) The PROJECT NAME field shall contain the name and location of the project edited to fit the space provided. The data appearing here shall appear on scheduling software reports. The abbreviation "Alpha." refers to an "Alphanumeric" field value and shall be used throughout the remainder of this specification.

6.b.(5) The CONTRACTOR NAME field shall contain the Construction Contractor's name, edited to fit the space provided.

6.b.(6) The ARROW OR PRECEDENCE field shall indicate which method shall be used for calculation of the schedule. The value "A" shall signify the Arrow Diagramming Method. The value "P" shall signify the Precedence Diagramming Method. The ACTIVITY ID field of the Activity Record shall be interpreted differently depending on the value of this field. The Precedence Record shall be required if the value of this field is "P". [Usage note: software systems may not support both arrow and precedence diagramming. It is recommended that the selection of the type of network be based on the capabilities of the software used by project partners.]

6.b.(7) The CONTRACT NUMBER field shall contain the contract number for the project. For example, the construction contract number DACA85-89-C-0001 shall be entered into this field as "890001".

6.b.(8) The PROJECT START field shall contain the date that the Contractor acknowledges the Notice to Proceed (NTP). [Usage note: Software systems may use a project start date to constrain the first activity of a network. To ensure consistent scheduling calculations across products, it is recommended that the first activity in the schedule contain an EARLY START constraint and a software system's PROJECT START date only be used to report on the project's start date.]

6.b.(9) The PROJECT END field shall contain the date that the Contractor plans to complete the work as approved by the Contracting Officer. [Usage note: software systems may use a project end date to constrain the last activity of a network. To ensure consistent scheduling calculations across products, it is recommended that the last activity in the schedule contain an EARLY START constraint and a software system's PROJECT END date only be used to report on the project's end date.]

6.c. Calendar Record: The Calendar Record(s) shall follow the Project Identifier Record in the first disk of data transferred. A minimum of one Calendar Record shall be required for all data exchange activity files. The format for the Calendar Record shall be as follows:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1 - 4	4	CLDR	FixedFilled	
CALENDAR CODE	6 - 6	1	√	Alpha.	Filled
WORKDAYS	8 - 14		SMTWTFS	Fixed	Filled
CALENDAR DESCRIPTION	16-45	30	√	Alpha.	Left Justified

6.c.(1) The RECORD IDENTIFIER shall always begin with "CLDR" to identify it as a Calendar Record. Each Calendar Record used shall have this identification in the first four columns. [Usage note: Systems contain a variety of calendar options. It is recommended that the least common denominator of calendar features between the systems be used as the basis for creating the SDEF file for a given project.]

6.c.(2) The CALENDAR CODE shall be used in the activity records to signify that this calendar is associated with the activity. [Usage note: Some systems do not allow for alphanumeric CALENDAR CODES, but only allow positive integers from 1 to 9. It is recommended that only positive integers be used for the CALENDAR CODE field to support the widest variety of scheduling systems.]

6.c.(3) The WORKDAYS field shall contain the work-week pattern selected with "Y", for Yes, and "N", for No. The first character shall be Sunday and the last character Saturday. An example of a typical five (5) day work-week would be NYYYYYN. A seven (7) day work-week would be YYYYYYY.

6.c.(4) The CALENDAR DESCRIPTION shall be used to briefly describe the calendar used.

6.d. Holiday Record: The Holiday Record(s) shall follow the Calendar Record(s) in the first disk of data transferred. There may be calendars without any holidays designated or several Holiday Records for each Calendar Record(s). The format for the Holiday Record shall be as follows:

ER 1-1-11
15 Jun 95

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1 - 4	4	HOLI	Fixed	Filled
CALENDAR CODE	6 - 6	1	√	Alpha.	Filled
HOLIDAY DATE	8 - 14	7	√	ddmmmyy	Filled
HOLIDAY DATE	16-22		-	ddmmmyy	May be Filled
HOLIDAY DATE	24-30		-	ddmmmyy	May be Filled
HOLIDAY DATE	32-38		-	ddmmmyy	May be Filled
HOLIDAY DATE	40-46		-	ddmmmyy	May be Filled
HOLIDAY DATE	48-54		-	ddmmmyy	May be Filled
HOLIDAY DATE	56-62		-	ddmmmyy	May be Filled
HOLIDAY DATE	64-70		-	ddmmmyy	May be Filled
HOLIDAY DATE	72-78		-	ddmmmyy	May be Filled
HOLIDAY DATE	80-86		-	ddmmmyy	May be Filled
HOLIDAY DATE	88-94		-	ddmmmyy	May be Filled
HOLIDAY DATE	96-102		-	ddmmmyy	May be Filled
HOLIDAY DATE	104-110		-	ddmmmyy	May be Filled
HOLIDAY DATE	112-118		-	ddmmmyy	May be Filled
HOLIDAY DATE	120-126		-	ddmmmyy	May be Filled

6.d.(1) The RECORD IDENTIFIER shall always begin with "HOLI". Each Holiday Record used shall have this identification in the first four columns.

6.d.(2) The CALENDAR CODE indicates which work-week calendar the holidays shall be applied to. More than one HOLI record may be used for a given CALENDAR CODE.

6.d.(3) The HOLIDAY DATE shall contain the date of each individual non-work day.

6.e. Activity Records: Activity Records shall follow any Holiday Record(s). If there are no Holiday Record(s), then the Activity Records shall follow the Calendar Record(s). There shall be one Activity Record for every activity in the network. Each activity shall have one record in the following format:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1-4	4	ACTV	Fixed	Filled
ACTIVITY ID	6-15	10	√	Integer	See Comment Below
ACTIVITY DESCR.	17-46	30	√	Alpha.	Left Justified
ACTIVITY DURATION	48-50	3	√	Integer	Right Justified
CONSTRAINT DATE	52-58	7		ddmmmyy	May be Filled
CONSTRAINT TYPE	60-61	2		ES or LF	May be Filled
CALENDAR CODE	63-63	1		Alpha.	Filled
HAMMOCK CODE	65-65	1	Y, blank	Fixed	May be Filled
WORKERS PER DAY	67-69	3		Integer	Right Justified
RESPONSIBILITY CODE	71-74	4		Alpha.	Left Justified
WORK AREA CODE	76-79	4		Alpha.	Left Justified
MOD OR CLAIM NO.	81-86	6		Alpha.	Left Justified
BID ITEM	88-93	6		Alpha.	Left Justified
PHASE OF WORK	95-96	2		Alpha.	Left Justified
CATEGORY OF WORK	98-98	1		Alpha.	May be Filled
FEATURE OF WORK	100-128	30		Alpha.	Left Justified

6.e.(1) The RECORD IDENTIFIER for each activity description record must begin with the four character "ACTV" code. This field shall be used for both the Arrow Diagram Method (ADM) and Precedence Diagram Method (PDM),

6.e.(2) The ACTIVITY ID consists of coding that shall differ, depending on whether the ADM or PDM method was selected in the Project Record. If the ADM method was selected then the field shall be interpreted as two right-justified fields of five (5) integers each. If the PDM method was selected the field shall be interpreted as one (1) right-justified field of ten (10) integers each. The maximum activity number allowed under this arrangement is 99999 for ADM and 9999999999 for the PDM method. [Usage note: Many systems allow alphanumeric ACTIVITY IDs. While the SDEF does not strictly, allow the use of alphanumeric values, users may agree to use the ACTIVITY ID field to exchange alphanumeric data. It is recommended that the ACTIVITY ID be restricted to integers when one or more of the systems being used for scheduling allows only integer ACTIVITY ID values.]

6.e.(3) The ACTIVITY DESCRIPTION shall be a maximum of 30 characters. Descriptions must be limited to the space provided.

6.e.(4) The ACTIVITY DURATION contains the estimated original duration for the activity on the schedule. The duration shall be based upon the work-week designated by the activity's related calendar.

6.e.(5) The CONSTRAINT DATE field shall be used to identify a date that the scheduling system may use to modify float calculations. If there is a date in this field, then there must be a valid entry in the CONSTRAINT TYPE field.

ER1-1-11
15 Jun 95

6.e.(6) The CONSTRAINT TYPE field shall be used to identify the way that the scheduling system shall use the CONSTRAINT DATE to modify schedule float calculations. If there is a value in this field, then there must be a valid entry in the CONSTRAINT DATE field. The valid values for the CONSTRAINT TYPE are as follows:

Definition

The CONSTRAINT DATE shall replace an activity's early start date, if the early start date is prior to the CONSTRAINT DATE.
The CONSTRAINT DATE shall replace an activity's late finish date, if the late finish date is after the CONSTRAINT DATE.

[Usage note: Systems provide a wide variety of constraint types that may not be supported by other systems. It is recommended that constraint types be restricted to the values above regardless of the capabilities of the various systems being used for scheduling.]

6.e.(7) The CALENDAR CODE relates this activity to an appropriate work-week calendar. The ACTIVITY DURATION must be based on the valid work-week referenced by this CALENDAR CODE field.

6.e.(8) The HAMMOCK CODE indicates that a particular activity does not have its own independent duration, but takes its start dates from the start date of the preceding activity (or node) and takes its finish dates from the finish dates of its succeeding activity (or node). If the value of the HAMMOCK CODE field is "Y", then the activity is a hammmock activity.

6.e.(9) The WORKERS PER DAY shall contain the average number of workers expected to work on the activity each day the activity is in progress. If this code is required by project scheduling specifications, values for this data will be right justified. Activities without workers per day shall have a value of "0".

6.e.(10) The RESPONSIBILITY CODE shall identify the subcontractors or major trade involved with completing the work for the activity. If this code is required by project scheduling specifications, value for this data will be left justified.

6.e.(11) The WORK AREA CODE shall identify the location of the activity within the project. If this code is required by project scheduling specifications, value for this data will be left justified.

6.e.(12) The MOD OR CLAIM NUMBER shall uniquely identify activities that are added or changed on a construction contract modification, or activities that justify any claimed time extensions. If this code is required by project scheduling specifications, value for this data will be left justified.

6.e.(13) The BID ITEM shall identify the bid item number associated with each activity. If this code is required by project scheduling specifications, value for this data will be left justified.

6.e.(14) The PHASE OF WORK shall identify the timing of a specific activity within the entire project. If this code is required by project scheduling specifications, value for this data will be left justified.

6.e.(15) The CATEGORY OF WORK shall identify the general type of work performed by every activity. If this code is required by project scheduling specifications, value for this data will be placed in the field.

6.e.(16) The FEATURE OF WORK shalI identify a very broad designation of the general type of work that is being accomplished by the activity. If this code is required by project scheduling specifications, value for this data will be left justified. [Usage note: Many systems require that FEATURE OF WORK values be placed in several activity code fields. It is recommended that users review SDEF documentation to determine the correct way to use a given software system to produce the FEATURE OF WORK code.]

6.f. Precedence Record: The Precedence Record(s) shall follow the Activity Records if a Precedence Diagram Method schedule (PDM) is identified in the ARROW OR PRECEDENCE field of the Project Record. The Precedence Record has the following format:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1 - 4	4	PRED	Fixed	Filled
ACTIVITY ID	6-15	10	√	Integer	See Comment Below
PRECEDING ACTIVITY	17 -26	10	√	Integer	See Comment Below
PREDECESSOR TYPE	28-28		√	S, F, C	Filled
LAG DURATION	30-33	4	√	Integer	Right Justified

6.f.(1) The RECORD IDENTIFIER shall begin with the four characters "PRED" in the first four columns of the record.

6.f.(2) The ACTIVITY ID identifies the activity whose predecessor shall be specified in this record.

6.f.(3) The PRECEDING ACTIVITY number is the number of an activity that precedes the activity noted in the ACTIVITY ID field.

6.f.(4) The PREDECESSOR TYPE field indicates the type of relation that exists between the chosen pair of activities. Valid PREDECESSOR TYPE fields areas follows:

ER1-1-11
15 Jun 95

Code	Definition
S	Start-to-Start relation
F	Finish-to-Finish relation
C	Finish-to-Start relation

[Usage note: Some systems provide additional predecessor types that may not be supported by all other systems. It is recommended that predecessor types be restricted to the values above regardless of the capabilities of the various systems being used for scheduling.]

6.f.(5) The LAG DURATION field contains the number of days delay between the preceding and current activity. [Usage note: Some systems allow negative values for the LAG DURATION. Because these values are not supported by all other systems, it is recommended that values be restricted to zero and positive integers.]

6.g. Unit Cost Record: The Unit Cost Record shall follow all Precedence Records. If the schedule utilizes the Arrow Diagram Method, then the Unit Cost Record shall follow any Activity records. There shall be one Unit Cost Record for every activity that is not a lump sum activity. [Usage note: (1) It is recommended that users who wish to exchange unit cost data contact SDEF vendor representatives to determine the ability of the software system to import/export unit cost information. (2) If the software being used by each member of the project team supports unit cost data then users may wish to conduct a trial run of the SDEF data exchange with a two or three-activity network to ensure that unit cost data transfers as expected. If problems are found please consult vendor representatives for resolution prior to exchange of full project schedules. (3) Unit cost record data does not, in most systems, result in the correct values being placed in the ACTIVITY COST and COST TO DATE fields of the Progress (PROG) Record. Users must, at this time, manually transfer the data from the Unit Cost Record to the Progress Record.

The fields for this record shall take the following format:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1 - 4	4	UNIT	Fixed	Filled
ACTIVITY ID	6-15	10	√	Integer	See Comment Below
TOTAL QTY	17-29	13	√	Format 8.4	Right Justified
COST PER UNIT	31-43	13	√	Format 8.4	Right Justified
QTY TO DATE	45-57	13	√	Format 8.4	Right Justified
UNIT OF MEASURE	59-61	3	√	Alpha.	Left Justified

6.g.(1) The RECORD IDENTIFIER shall be identified with the four characters 'UNIT" placed in the first four columns of the record.

6.g.(2) The ACTIVITY ID for each activity shall match the format described in the activity record. Each activity may have only one Unit Cost Record.

6.g.(3) The TOTAL QTY is the total amount of material to be used in this activity. This number consists of eight digits, one decimal point and four more digits. An example of a number in this format is "11111111.1111". If decimal places are not needed this field shall still contain a ".0000" in columns 25-29. [Usage note: Many systems support a different format for this value that does not include as many decimal places. It is recommended that users determine their requirements for significant digits based on the lowest common denominator of the software systems being used for a given project.]

6.g.(4) The COST PER UNIT is the cost, in dollars and cents, for each unit to be used in this activity. This number consists of eight digits, one decimal point, and four more digits. An example of a number in this format is "11111111.1111". If decimal places are not needed this field shall still contain a ".0000" in columns 39-43. [Usage note: Many systems support a different format for this value that does not include as many decimal places. It is recommended that users determine their requirements for significant digits based on the lowest common denominator of the software systems being used for a given project.]

6.g.(5) The QTY TO DATE is the quantity of material installed in this activity up to the data date. This number consists of eight digits, one decimal point, and four more digits. An example of a number in this format is "11111111.1111". If decimal places are not needed this field shall still contain a ".0000" in columns 53-57. [Usage note: Many systems support a different format for this value that does not include as many decimal places. It is recommended that users determine their requirements for significant digits based on the lowest common denominator of the software systems being used for a given project.]

6.g.(6) The UNIT OF MEASURE is an abbreviation that may be used to describe the units being measured for this activity. Valid values for this field are any meaningful English or metric unit, except "LS" for Lump Sum. Lump Sum activities are not to have Unit Cost Records.

6.h. Progress Record: Progress Record(s) shall follow all Unit Cost Record(s). If there are no Unit Cost Record(s), then the Progress Record(s) shall follow all Precedence Records. If the schedule utilizes the Arrow Diagram Method, then the Progress Record shall follow any Activity Records. One Progress Record is required for every activity in the Activity Record. The fields for this Record shall be provided in the following format:

ER1-1-11
15 Jun 95

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1-4	4	PROG	Fixed	Filled
ACTIVITY ID	6-5	10	√	Integer	See Comment Below
ACTUAL START DATE	17-23	7	√	ddmmmyy	Filled if Started
ACTUAL FINISH DATE	25-31	7	√	ddmmmyy	Filled if Finished
REMAINING DURATION	33-35	3	√	Integer	Right Justified
ACTIVITY COST	37-48	12	√	Format 9.2	Right Justified
COST TO DATE	50-61	12	√	Format 9.2	Right Justitied
STORED MATERIAL	63-74	12	√	Format 9.2	Right Justified
EARLY START DATE	76-82	7	√	ddmmmyy	Filled if Not Started
EARLY FINISH DATE	84-90	7	√	ddmmmyy	Filled if Not Finished
LATE START DATE	92-98	7	√	ddmmmyy	Filled if Not Started
LATE FINISH DATE	100-1067		√	ddmmmyy	Filled if Not Finished
FLOAT SIGN	108-1081		+, -	Fixed	Filled if Not Finished
TOTAL FLOAT	110-1123		√	Integer	R. Just. if Not Finished

6.h.(1) The RECORD IDENTIFIER shall begin with the four characters "PROG" in the first four columns of the record.

6.h.(2) The ACTIVITY ID for each activity for which progress has been posted shall match the format described in the Activity Record.

6.h.(3) An ACTUAL START DATE is required for alI in-progress activities. The ACTUAL START DATE shall be the same as, or later than, the PROJECT START date contained in the Project Record. The ACTUAL START DATE shall also be the same as, or prior to, the DATA DATE contained in the Project Record. If there is an ACTUAL START DATE for an activity that there must also be a REMAINING DURATION, and the values for the EARLY START DATE and LATE START DATE are blank. [Usage note: Some systems allow default values for ACTUAL START DATE if the date is not entered by the user. Because the failure to include a start date for activities may result in different schedule calculations, it is recommended that the ACTUAL START DATE be required for all activities in progress.]

6.h.(4) An ACTUAL FINISH DATE is required for all completed activities. If the REMAINING DURATION of an activity is zero, then there must be an ACTUAL FINISH DATE. If there is an ACTUAL FINISH DATE, then values for the EARLY START DATE, LATE START DATE, EARLY FINISH DATE, LATE FINISH DATE, FLOAT SIGN, and TOTAL FLOAT shall be blank. [Usage note: Some systems allow default values for ACTUAL FINISH DATE if the date is not entered by the user. Because the failure to include a finish date for activities may result in different schedule calculations, it is recommended that the ACTUAL FINISH DATE be required for all activities in progress.]

6.h.(5)AREMAININ G DURATION is required for all activities. Activities that have not started shall have a remaining duration equal to their original duration. Activities completed based on time, shall have a zero (0) REMAINING DURATION. [Usage note: Systems have a variety of "short-cut" methods to determine the REMAINING DURATION value. It is recommended that users actually consider the time required to complete the remaining work on a given task, rather than allow a system to calculate the remaining duration based on the amount of work that has already been accomplished.]

6.h.(6) The ACTIVITY COST contains the estimated earned value of the work to be accomplished in the activity. An example of a number in this format is "1111111 11.11". If decimal places are not needed this field shall still contain a ".00" in the last three columns of this field. [Usage note: Users should inquire of software vendors if the user needs to add a zero in the data field to produce the default value "0.00".]

6.h.(7) The COST TO DATE contains the earned value for the activity. If there is an ACTUAL START DATE, then there must also be some value for COST TO DATE. An example of a number in this format is "111111111.11". If decimal places are not needed, this field shall still contain a ".00" in the last three columns of this field. The COST TO DATE is not tied to REMAINING DURATION. For example, if the REMAINING DURATION is "0", the COST TO DATE may only be 95% of the ACTIVITY COST. This difference may be used to reflect 5% retainage for punch list items. [Usage note: Systems implement cost information in different ways. It is recommended that users carefully review SDEF documentation and test results to determine how to ensure that SDEF data is exported correctly.]

6.h.(8) The STORED MATERIAL field contains the value of the material that the Contractor has paid for and is on site or in secure storage areas that is a portion of the COST TO DATE. An example of a number in this format is "111111111.11". If decimal places are not needed, this field shall still contain a ".00" in the last three columns of this field. [Usage note: Systems implement the stored materials field in a variety of ways. Many systems do not enforce STORED MATERIAL + COST TO DATE < ACTIVITY COST. To avoid potential confusion between systems, it is recommended that new activities be added to a schedule to reflect the cost of large equipment procurement rather than use the STORED MATERIALS field.]

6.h.(9) The EARLY START DATE indicates the earliest date possible that an activity can start as calculated by a CPM scheduling system or other Contracting Officer approved planning method. If the progress record for an activity contains an ACTUAL START DATE, then this field shall be blank.

6.h.(10) The EARLY FINISH DATE indicates the earliest date possible that an activity can finish as calculated by a CPM scheduling system or other Contracting Officer approved planning method. If the progress record for an activity contains an ACTUAL FINISH DATE, then this field shall be blank.

6.h.(11) The LATE START DATE indicates the latest date that an activity can begin as calculated by a CPM scheduling system or other Contracting Officer approved planning method. If the progress record for an activity contains an ACTUAL START DATE, then this field shall be blank.

ER 1-1-11
15 Jun 95

6.h.(12) The LATE FINISH DATE indicates the latest date that an activity can finish as calculated by a CPM scheduling system or other Contracting Officer approved planning method. If the progress record for an activity contains an ACTUAL FINISH DATE, then this field shall be blank.

6.h.(13) The FLOAT SIGN indicates whether the float time calculated using a CPM scheduling system or other Contracting Officer approved planning method, is positive or negative in nature. If the progress record for an activity contains an ACTUAL FINISH DATE, then this field shall be blank. In the case of zero float this field shall be blank.

6.h.(14) The TOTAL FLOAT indicates the total float time. In the Precedence Diagram Method (PDM), the total float is the difference between the early and late start or finish dates. In the Arrow Diagram Method (ADM), the total float is equal to the late event time at the end of the activity, minus the sum of the early event time at the start of the activity plus the duration of the activity.

6.i. Project End Record: The Project End Record shall be used to identify that the data file is completed. If the ASCII End of File character is encountered, then data import programs shall use that character to infer that the data continues on the next disk. The user shall then be prompted for the next disk number, based on the VOLM record data. The Project End Record shall be the last record of the entire data file, and shall have the following format:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1-3	3	END	Fixed	Filled

6.i.(1) The RECORD IDENTIFIER for the Project End Record shall be "END". Data contained in the data exchange file that occurs after this record shall not be used.

-- END OF SECTION --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUBMITTAL IDENTIFICATION (SD)
1.2 SUBMITTAL CLASSIFICATION
1.2.1 Government Approved
1.2.2 Information Only
1.3 APPROVED SUBMITTALS
1.4 DISAPPROVED SUBMITTALS
1.5 WITHHOLDING OF PAYMENT
1.6 GENERAL
1.7 SUBMITTAL REGISTER
1.8 SCHEDULING
1.9 TRANSMITTAL FORM (ENG FORM 4025)
1.10 SUBMITTAL PROCEDURES
1.10.1 Procedures
1.10.2 Deviations
1.11 CONTROL OF SUBMITTALS
1.12 GOVERNMENT APPROVED SUBMITTALS
1.13 INFORMATION ONLY SUBMITTALS
1.14 STAMPS
1.15 ATTACHMENTS

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

-- End of Section Table of Contents --

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUBMITTAL IDENTIFICATION (SD)

Submittals required are identified by SD numbers and titles as follows:

SD-01 Preconstruction Submittals

SD-02 Shop Drawings

SD-03 Product Data

SD-04 Samples

SD-05 Design Data

SD-06 Test Reports

SD-07 Certificates

SD-08 Manufacturer's Instructions

SD-09 Manufacturer's Field Reports

SD-10 Operation and Maintenance Data

SD-11 Closeout Submittals

1.2 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.2.1 Government Approved

Government approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings."

1.2.2 Information Only

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.3 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of

construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.4 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the Contracting Officer.

1.5 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

1.6 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) System Manager and each item shall be stamped, signed, and dated by the CQC System Manager indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

1.7 SUBMITTAL REGISTER

At the end of this section is a submittal register showing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required. The Contractor shall create and maintain a submittal register for the project in accordance with SECTION 01312 QUALITY CONTROL SYSTEM (QCS).

1.8 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 30 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals.

1.9 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

1.10 SUBMITTAL PROCEDURES

Submittals shall be made as follows:

1.10.1 Procedures

a. Government Approved and Information Only submittals shall be listed on separate ENG Form 4025's.

b. Sample for testing shall be delivered in accordance with SECTION 01451 CONTACTOR QUALITY CONTROL. All other submittals shall be delivered to the Contracting Officer.

1.10.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

1.11 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.12 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. Four copies of the submittal will be retained by the Contracting Officer and one copies of the submittal will be returned to the Contractor.

1.13 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

1.14 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

```
 ____________________________________________________________________________
|                                CONTRACTOR
|
|
|                                (Firm Name)
|
|
|
|
|
| _____ Approved
|
|
|
|
| _____ Approved with corrections as noted on submittal data and/or
|
| attached sheets(s).
|
|
|
|
|
| SIGNATURE:  ______________________________________________________________
|
|
| TITLE:  ___________________________________________________________________
|
|
| DATE:  ____________________________________________________________________
|
|
|
```

|_____|

1.15 ATTACHMENTS

Submittal Registers

ENG Form 4025

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
OAK AVE / NEELY ROAD UTILITIES UPGRADE

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01015	SD-01 Preconstruction Submittals															
			Utility Service Plan	1.21.1	G													
			SD-03 Product Data															
			Materials list for temporary utility	1.22.2														
			services															
		01356	SD-01 Preconstruction Submittals															
			Storm Water Pollution Prevention	1.5.1	G CO													
			Plan (SWPPP)															
			Notice of Intent (NOI)	1.5.2	G CO													
			Description of the Project	1.5.2	G CO													
			Notice of Termination (NOT)	1.5.4	G CO													
			SD-07 Certificates															
			Mill Certificate or Affidavit	2.1.3	G CO													
		01411	SD-01 Preconstruction Submittals															
			Environmental Pollution Control	1.8														
		01525	SD-01 Preconstruction Submittals															
			Accident Prevention Plan (APP)	1.8	G													
			Activity Hazard Analysis (AHA)	1.9	G													
			Proof of qualification	3.4.3	G													
			SD-06 Test Reports															
			Reports	1.13														
			Accident Reports	1.13.1														
			Monthly Exposure Reports	1.13.3														
			Regulatory Citations and	1.13.4														
			Violations															
			Crane Reports	1.13.5														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
OAK AVE / NEELY ROAD UTILITIES UPGRADE

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01525	SD-07 Certificates															
			Confined Space Entry Permit	1.10														
		01721	SD-11 Closeout Submittals															
			As-Built Photos	1.4	G EN-E													
			Photo Spreadsheet	1.4.1	G EN-E													
			Materials Spreadsheet	1.5	G EN-E													
			AutoCad Schematics	1.3	G EN-E													
		01780	SD-02 Shop Drawings															
			As-Built Drawings	1.2.1	G AO													
			SD-03 Product Data															
			As-Built Record of Equipment and	1.2.2	G AO													
			Materials															
			Warranty Management Plan	1.3.1	G AO													
			Warranty Tags	1.3.5														
			Final Cleaning	1.6	G AO													
		02112	SD-01 Preconstruction Submittals															
			Sampling and Analysis Plan	3.2	G													
			Safety and Health Program (SHP)	3.7.1	G													
			Correspondence	3.7.4														
			SD-07 Certificates															
			Qualifications	3.3.1	G													
			SD-09 Manufacturer's Field															
			Reports															
			Field Report	3.6.1	G													
			Field Report	3.6.1	G													
		02220	SD-03 Product Data															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
OAK AVE / NEELY ROAD UTILITIES UPGRADE

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02220	Work Plan	1.4.1	G	RE												
		02300	SD-06 Test Reports															
			Testing	3.14														
			SD-07 Certificates															
			Testing	3.14														
		02511	SD-03 Product Data															
			Materials	1.4.1														
			Alignment Guides	3.15														
			Hangers	3.4														
			Couplings	3.14														
			Gaskets	2.4														
			Pipe	2.2.1														
			Valves	2.6.1														
			Fire Hydrants	2.7														
			Fittings	2.5.1														
			Pipe Supports	1.4.2														
			Anchors	1.4.3														
			SD-08 Manufacturer’s Instructions															
			Manufacturer's Recommendations	1.4.4														
			SD-06 Test Reports															
			Hydrostatic tests	1.4.5														
			Disinfection	1.4.6														
		02533	SD-03 Product Data															
			Materials	1.4.1														
			Calculation of Pipe Supports	1.4.2														
			Calculation of Pipe Anchors	1.4.3	G													

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
OAK AVE / NEELY ROAD UTILITIES UPGRADE

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02533	Pipe Support System Descriptive	1.4.2	G													
			Data															
			SD-06 Test Reports															
			Hydrostatic tests	1.4.4														
			SD-08 Manufacturer's Instructions															
			Manufacturer's procedures	2.1.2														
		02552	SD-02 Shop Drawings															
			Heat Distribution System	2.2	G													
			SD-03 Product Data															
			Cathodic Protection Installation	3.5.7	G													
			Operational Test	3.6.2.3	G													
			Work Plan	3.1.1	G													
			Quality Assurance Plan	3.1.2														
			Tests	3.6	G													
			UHDS Manufacturer's	3.5.4														
			Representative Reports															
			Connecting to Existing Work	3.1.4	G													
			UHDS Manufacturer	1.2.4	G													
			UHDS Manufacturer's	1.2.5	G													
			Representative															
			UHDS Design	1.3.2	G													
			Certificate of Compliance	3.5.4	G													
			SD-10 Operation and Maintenance															
			Data															
			Heat Distribution System	2.2	G													
		02559	SD-02 Shop Drawings															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
OAK AVE / NEELY ROAD UTILITIES UPGRADE

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02559	Heat Distribution System	1.3.1														
			SD-03 Product Data															
			Spare Parts	1.3.2														
			SD-04 Samples															
			Insulation	1.3.3														
			SD-05 Design Data															
			Calculation of Pipe Supports	1.3.4	G													
			Calculation of Pipe Anchors	1.3.5	G													
			SD-06 Test Reports															
			Tests	3.11														
			SD-07 Certificates															
			Flange Gasket Kits	2.2.3														
			SD-10 Operation and Maintenance															
			Data															
			Steam Distribution System	1.6.1	G													
		02560	SD-01 Preconstruction Submittals															
			Heating and Temperature	3.8.3														
			Monitoring Plan															
			SD-02 Shop Drawings															
			Detail Drawings	1.4.1	G EN-T													
			Fabrication and Erection Drawings	1.4.2														
			SD-03 Product Data															
			Schedules of Work and Tests	1.4.3														
			Required for Installation															
			Manufacturer's Catalog Data	1.4.4														
			SD-04 Samples															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
OAK AVE / NEELY ROAD UTILITIES UPGRADE

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02560	Materials	1.4.5														
			SD-05 Design Data															
			Steel Strut Pipe Support System	1.6.1														
			Seismic Bracing	1.6														
			SD-08 Manufacturer's Instructions															
			Waterproofing Material	1.4.6														
			SD-10 Operation and Maintenance															
			Data															
			Operation and Maintenance	1.4.7	G													
			Manuals															
		02740	SD-01 Preconstruction Submittals															
			Job Mix Design	2.1	G													
			SD-06 Test Reports															
			Aggregate Base Course	2.2														
			SD-07 Certificates															
			Prime Coat	2.3														
			Asphalt-Concrete Pavement	3.3														
			Installation															
			Tack Coat	2.5														
		02760	SD-03 Product Data															
			Manufacturer's Instructions	3.3.2	G													
			Equipment	1.5	G													
			SD-04 Samples															
			Materials	2.1	G													
		02921	SD-03 Product Data															
			Equipment	2.4.1														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
OAK AVE / NEELY ROAD UTILITIES UPGRADE

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02921	Erosion Control Materials	3.6.3														
			Chemical Treatment Material	1.4.3														
			Delivery	1.4.1														
			Finished Grade and Topsoil	3.2.1														
			Topsoil	1.3														
			Quantity	1.4.1														
			Seed Establishment Period	3.6														
			Maintenance Record	3.6.3.5														
			SD-04 Samples															
			Delivered Topsoil	1.4.1.1														
			Soil Amendments	2.3														
			Mulch	2.4														
			SD-06 Test Reports															
			Equipment Calibration	3.1.3														
			Soil Test	3.1.4														
			SD-07 Certificates															
			Seed	2.1	G ED													
			Topsoil	1.3														
			pH Adjuster	1.4.1														
			Fertilizer	2.3.2														
			Organic Material	1.4.1														
			Soil Conditioner	3.2.2.3														
			Mulch	2.4														
		02930	SD-03 Product Data															
			Delivery	1.4.1														
			Plant Establishment Period	3.8	G													

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
OAK AVE / NEELY ROAD UTILITIES UPGRADE

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02930	Maintenance Record	3.8.2.3														
			SD-04 Samples															
			Delivered Topsoil	1.4.1.3														
			Soil Amendments	3.1.4.1	G													
			Mulch	2.4	G													
			SD-06 Test Reports															
			Soil Test	3.1.4.1														
			SD-07 Certificates															
			Plant Material	2.1														
			Topsoil	2.2														
			pH Adjuster	2.3.1														
			Fertilizer	2.3.2														
			Organic Material	2.3.3														
			Soil Conditioner	2.3														
			Organic Mulch	2.4.1														
			Mycorrhizal Fungi Inoculum	2.1.6.1														
			SD-10 Operation and Maintenance															
			Data															
			Maintenance Instructions	3.8.4														
		03101	SD-02 Shop Drawings															
			Shop Drawings	1.4														
			SD-03 Product Data															
			Materials	2.1														
			SD-04 Samples															
			Sample Panels	1.5	G													
			SD-06 Test Reports															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
OAK AVE / NEELY ROAD UTILITIES UPGRADE

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		03101	Inspection	3.3														
			Formwork Not Supporting Weight	3.2.1														
			of Concrete															
		03150	SD-02 Shop Drawings															
			Waterstops	2.1	G													
			SD-03 Product Data															
			Waterstops	2.1														
			SD-04 Samples															
			Non-metallic Materials	2.1.1														
			SD-07 Certificates															
			Waterstops	2.1														
		03200	SD-02 Shop Drawings															
			Reinforcement	3.1														
			SD-03 Product Data															
			Welding	1.3														
			SD-07 Certificates															
			Reinforcing Steel	2.1														
		03300	SD-03 Product Data															
			Mixture Proportions	1.5	G													
			SD-06 Test Reports															
			Testing and Inspection for	3.12	G													
			Contractor Quality Control															
		05090	SD-03 Product Data															
			Welding Procedure Qualifications	1.5														
			Welder, Welding Operator, and	1.6														
			Tacker Qualification															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
OAK AVE / NEELY ROAD UTILITIES UPGRADE

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		05090	Inspector Qualification	1.7														
			Previous Qualifications	1.5.1														
			Prequalified Procedures	1.5.2														
			SD-06 Test Reports															
			Quality Control	3.2														
		05093	SD-02 Shop Drawings															
			Pressure Piping	1.4	G													
			SD-03 Product Data															
			Qualifications	1.6	G													
			Welding Operations	3.1	G													
			SD-07 Certificates															
			Qualifications	1.6	G													
		05500	SD-04 Samples															
			Miscellaneous Metal Items	1.6														
		09900	SD-03 Product Data															
			Coating	2.1														
			Manufacturer's Technical Data	2.1														
			Sheets															
			SD-04 Samples															
			Color	3.4.1														
			SD-08 Manufacturer’s Instructions															
			Application instructions	3.2.1														
			Mixing	3.4.2														
		13110	SD-02 Shop Drawings															
			Drawings	1.3.9	G													
			Contractor's Modifications	1.3.2	G													

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
OAK AVE / NEELY ROAD UTILITIES UPGRADE

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		13110	SD-03 Product Data															
			Cathodic Protection Equipment	1.3.10	G													
			Spare Parts	3.9														
			SD-06 Test Reports															
			Tests and Measurements	3.5	G													
			Contractor's Modifications	1.3.2	G													
			SD-07 Certificates															
			Cathodic Protection System	1.3.8														
			Services of 'Corrosion Expert'	1.3.1	G													
			SD-10 Operation and Maintenance															
			Data															
			Cathodic Protection System	1.3.8														
			Training Course	3.6														
		13280	SD-03 Product Data															
			Respiratory Protection Program	1.12	G ES-M													
			Asbestos Hazard Abatement Plan	1.7														
			Cleanup and Disposal	3.9														
			Detailed Drawings	3.4.5.2	G ES-M													
			Materials and Equipment	1.20														
			Qualifications	1.5	G ES-M													
			Training Program	1.11	G ES-M													
			Medical Requirements	1.10	G ES-M													
			SD-06 Test Reports															
			Exposure Assessment and Air	3.7	G ES-M													
			Monitoring															
			Local Exhaust Ventilation	1.22														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
OAK AVE / NEELY ROAD UTILITIES UPGRADE

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		13280	Licenses, Permits and	1.14	G ES-M													
			Notifications															
			SD-07 Certificates															
			Vacuum, Filtrationand Ventilation	1.21														
			Equipment															
		13281	SD-03 Product Data															
			Materials and Equipment	1.18														
			Expendable Supplies	1.19														
			Qualifications	1.5	G EN-E													
			SD-06 Test Reports															
			Pressure Differential Log	1.17.4														
			Licences, Permits, and	1.11	G EN-E													
			Notifications															
			Accident Prevention Plan (APP)	1.7	G EN-E													
			Sampling and Analysis	1.13	G EN-E													
			Clearance Report	3.7	G EN-E													
		16070	SD-03 Product Data															
			Contractor Designed Bracing	1.3.3														
			Equipment Requirements	1.4														
			Lighting Fixtures in Buildings	3.1														
		16370	SD-02 Shop Drawings															
			Electrical Distribution System	3.11.3														
			Nameplates	2.3														
			SD-06 Test Reports															
			Field Testing	3.11														
		16375	SD-02 Shop Drawings															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
OAK AVE / NEELY ROAD UTILITIES UPGRADE

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG# RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		16375	Electrical Distribution System	3.7.3	G													
			Nameplates	2.2														
			Material and Equipment	2.1														
			SD-06 Test Reports															
			Field Testing	3.7														
			General Installation Requirements	3.1														
			SD-07 Certificates															
			Material and Equipment	2.1														
			Cable Installer Qualifications	3.1.1														
		16415	SD-02 Shop Drawings															
			Electrical Equipment	3.11	G													
			SD-03 Product Data															
			Manufacturer's	2.1.1														
			Fixture	2.8.2														
			SD-07 Certificates															
			Materials and Equipment	1.4														

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE

(Read instructions on the reverse side prior to initiating this form)

DATE

TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO:

FROM:

CONTRACT NO.

CHECK ONE:
☐ THIS IS A NEW TRANSMITTAL
☐ THIS IS A RESUBMITTAL OF TRANSMITTAL _____

SPECIFICATION SEC. NO. *(Cover only one section with each transmittal)*

PROJECT TITLE AND LOCATION

CHECK ONE: THIS TRANSMITTAL IS FOR GOV'T. APPROVAL ☐ FIO

ITEM NO. *a.*	DESCRIPTION OF ITEM SUBMITTED *(Type size, model number/etc.)* *b.*	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. *(See instruction no. 8)* *c.*	NO. OF COPIES *d.*	CONTRACT REFERENCE DOCUMENT: SPEC. PARA. NO. *e.*	CONTRACT REFERENCE DOCUMENT: DRAWING SHEET NO. *f.*	FOR CONTRACTOR USE CODE *g.*	VARIATION *(See instruction No. 6)* *h.*	FOR CE USE CODE *i.*

REMARKS

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated.

_____
NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED *(List by Item No.)*

NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY

DATE

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.

2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.

3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.

4. Submittals requiring expeditious handling will be submitted on a separate form.

5. Separate transmittal form will be used for submittals under separate sections of the specifications.

6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".

7. Form is self-transmittal, letter of transmittal is not required.

8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.

9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

A	--	Approved as submitted.	E	--	Disapproved (See attached).
B	--	Approved, except as noted on drawings.	F	--	Receipt acknowledged.
C	--	Approved, except as noted on drawings. Refer to attached sheet resubmission required.	FX	--	Receipt acknowledged, does not comply as noted with contract requirements.
D	--	Will be returned by separate correspondence.	G	--	Other *(Specify)*

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

(Reverse of ENG Form 4025-R)

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01356

STORM WATER POLLUTION PREVENTION MEASURES

PART 1 GENERAL

1.1 REFERENCES
1.2 GENERAL
1.3 SUBMITTALS
1.4 EROSION AND SEDIMENT CONTROLS
1.4.1 Stabilization Practices
1.4.1.1 Unsuitable Conditions
1.4.1.2 No Activity for Less Than 21 Days
1.4.2 Structural Practices
1.4.2.1 Silt Fences
1.4.2.2 Straw Bales
1.4.2.3 Diversion Dikes
1.5 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
1.5.1 Storm Water Pollution Prevention Plan (SWPPP)
1.5.2 Notice of Intent (NOI)
1.5.3 Filing
1.5.4 Notice of Termination (NOT)

PART 2 PRODUCTS

2.1 COMPONENTS FOR SILT FENCES
2.1.1 Filter Fabric
2.1.2 Silt Fence Stakes and Posts
2.1.3 Mill Certificate or Affidavit
2.1.4 Identification Storage and Handling
2.2 COMPONENTS FOR STRAW BALES

PART 3 EXECUTION

3.1 INSTALLATION OF SILT FENCES
3.2 INSTALLATION OF STRAW BALES
3.3 MAINTENANCE
3.3.1 Silt Fence Maintenance
3.3.2 Straw Bale Maintenance
3.3.3 Diversion Dike Maintenance
3.4 INSPECTIONS
3.4.1 General
3.4.2 Inspections Details
3.4.3 Inspection Reports
3.5 ATTACHMENTS

-- End of Section Table of Contents --

SECTION 01356

STORM WATER POLLUTION PREVENTION MEASURES

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 4439	(1997) Standard Terminology for Geosynthetics
ASTM D 4491	(1996) Water Permeability of Geotextiles by Permittivity
ASTM D 4533	(1991; R 1996) Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(1991; R 1996)) Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	(1995) Determining Apparent Opening Size of a Geotextile
ASTM D 4873	(1995) Identification, Storage, and Handling of Geosynthetic Rolls

1.2 GENERAL

The Contractor shall implement the storm water pollution prevention measures specified in this section in a manner which will meet the requirements of SECTION 01411 ENVIRONMENTAL PROTECTION, and the requirements of the National Pollution Discharge Elimination System (NPDES) permit.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Storm Water Pollution Prevention Plan (SWPPP); G, CO

Notice of Intent (NOI); G, CO

Description of the Project; G, CO

Notice of Termination (NOT); G, CO

SD-07 Certificates

Mill Certificate or Affidavit; G, CO.

Certificate attesting that the Contractor has met all specified requirements.

1.4 EROSION AND SEDIMENT CONTROLS

The controls and measures required by the Contractor are described below. Any control or combination of controls may be used by the Contractor. The method or methods employed by the Contractor shall be coordinated and approved by the Contracting Officer to implementation.

1.4.1 Stabilization Practices

The stabilization practices to be implemented shall include temporary seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, erosion control matts, protection of trees, preservation of mature vegetation, etc. On his daily CQC Report, the Contractor shall record the dates when the major grading activities occur, (e.g., clearing and grubbing, excavation, embankment, and grading); when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated. Except as provided in paragraphs UNSUITABLE CONDITIONS and NO ACTIVITY FOR LESS THAN 21 DAYS, stabilization practices shall be initiated as soon as practicable, but no more than 14 days, in any portion of the site where construction activities have temporarily or permanently ceased.

1.4.1.1 Unsuitable Conditions

Where the initiation of stabilization measures by the fourteenth day after construction activity temporarily or permanently ceases is precluded by unsuitable conditions caused by the weather, stabilization practices shall be initiated as soon as practicable after conditions become suitable.

1.4.1.2 No Activity for Less Than 21 Days

Where construction activity will resume on a portion of the site within 21 days from when activities ceased (e.g., the total time period that construction activity is temporarily ceased is less than 21 days), then stabilization practices do not have to be initiated on that portion of the site by the fourteenth day after construction activity temporarily ceased.

1.4.2 Structural Practices

Structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Structural practices shall include the following devices.

1.4.2.1 Silt Fences

The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading). Silt fences shall be installed in the locations as needed. Final removal of silt fence barriers shall be upon approval by the Contracting Officer.

1.4.2.2 Straw Bales

The Contractor shall provide bales of straw as a temporary structural practice to minimize erosion and sediment runoff. Bales shall be properly placed to effectively retain sediment immediately after completing each phase of work (e.g., clearing and grubbing, excavation, embankment, and grading) in each independent runoff area (e.g., after clearing and grubbing in a area between a ridge and drain, bales shall be placed as work progresses, bales shall be removed/replaced/relocated as needed for work to progress in the drainage area). Areas where straw bales are to be used are shown on the drawings. Final removal of straw bale barriers shall be upon approval by the Contracting Officer. Rows of bales of straw shall be provided as follows:

a. Along the downhill perimeter edge of all areas disturbed.

b. Along the top of the slope or top bank of drainage ditches, channels, swales, etc. that traverse disturbed areas.

c. Along the toe of all cut slopes and fill slopes of the construction areas.

d. Perpendicular to the flow in the bottom of existing drainage ditches, channels, swales, etc. that traverse disturbed areas or carry runoff from disturbed areas. Rows shall be spaced a maximum of 10 feetapart.

e. Perpendicular to the flow in the bottom of new drainage ditches, channels, and swales. Rows shall be spaced a maximum of 10 feet apart as shown on the drawings.

f. At the entrance to culverts that receive runoff from disturbed areas.

1.4.2.3 Diversion Dikes

Diversion dikes shall have a maximum channel slope of 2 percent and shall be adequately compacted to prevent failure. The minimum height measured from the top of the dike to the bottom of the channel shall be 18 inches. The minimum base width shall be 6 feet and the minimum top width shall be 2 feet. The Contractor shall ensure that the diversion dikes are not damaged by construction operations or traffic. Diversion dikes shall be located as shown on the drawings.

1.5 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

Work shall comply with EPA NPDES General Permit.

1.5.1 Storm Water Pollution Prevention Plan (SWPPP)

The Contractor shall prepare a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the Environmental Protection Agency's NPDES General Permits for Storm Water Discharges from Construction Activities published in the Federal Register Tuesday, February 17, 1998, pages 7901-8014. The Contractor is also responsible for compliance with any updates and changes to this permit. The Contracting Officer will retain authority assigned therein to the State. The SWPPP shall be submitted to the Contracting Officer for review and approval as part of the Environmental Protection Plan specified in SECTION 01411 ENVIRONMENT PROTECTION.

1.5.2 Notice of Intent (NOI)

The Contractor shall complete EPA Form 3510-9, Notice of Intent for Storm Water Discharges Associated with Construction Activity Under a NPDES General Permit, in accordance with the aforementioned manual. A copy of the form is attached hereto and made a part of these specifications. Sections II and III have been completed in advance by the Government for this project. The Contractor shall complete Sections I, IV and V and submit the form, along with the SWPPP, a one page description of the project, a copy of the Civil Drawings, and prepaid mailing envelopes for the whole package to the Contracting Officer for review.

1.5.3 Filing

Upon receipt of satisfactory submittal from the Contractor, the Resident Engineer will promptly complete a separate 3510-9, for the Government, and forward both the Contractor-prepared and Resident Engineer-prepared forms to the NPDES Program Director. In accordance with applicable requirements, no onsite work shall be performed until two days after the documents have been post marked, notwithstanding any other provisions of the contract.

The Government will forward copies of both Form 3510-9's, along with the SWPPP, the one-page project description, and civil drawings to the Alaska Department of Environmental Conservation (ADEC) in accordance with State of Alaska regulations. The Contractor shall pay all fees required for review in accordance with 18 AAC 72.

1.5.4 Notice of Termination (NOT)

Upon completion of work at the project site, the Contractor shall prepare EPA Form 3510-13, Notice of Termination of Coverage Under the NPDES General Permit for Storm Water Discharges Associated with Industrial Activity, in accordance with the regulations stated on the form. A copy of the form is attached hereto and made a part of these specifications. The completed form and prepaid mailing envelopes shall be submitted to the Contracting Officer within 10 days after the earliest date that final site conditions meet filing requirements. The Resident Engineer will promptly complete a separate 3510-13, for the Government. The Government will forward both forms to the NPDES Program Director.

PART 2 PRODUCTS

2.1 COMPONENTS FOR SILT FENCES

2.1.1 Filter Fabric

The geotextile shall comply with the requirements of ASTM D 4439, and shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistance to deterioration due to ultraviolet and heat exposure. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 to 120 degrees F. The filter fabric shall meet the following requirements:

FILTER FABRIC FOR SILT SCREEN FENCE

PHYSICAL PROPERTY	TEST PROCEDURE	STRENGTH REQUIREMENT
Grab Tensile	ASTM D 4632	100 lbs. min.
Elongation (%)		30 % max.
Trapezoid Tear	ASTM D 4533	55 lbs. min.
Permittivity	ASTM D 4491	0.2 sec-1
AOS (U.S. Std Sieve)	ASTM D 4751	20-100

2.1.2 Silt Fence Stakes and Posts

The Contractor may use either wooden stakes or steel posts for fence construction. Wooden stakes utilized for silt fence construction, shall have a minimum cross section of 2 inches by 2 inches when oak is used and 4 inches by 4 inches when pine is used, and shall have a minimum length of5 feet. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 5 feet.

2.1.3 Mill Certificate or Affidavit

A mill certificate or affidavit shall be provided attesting that the fabric and factory seams meet chemical, physical, and manufacturing requirements specified above. The mill certificate or affidavit shall specify the actual Minimum Average Roll Values and shall identify the fabric supplied by roll identification numbers. The Contractor shall submit a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the filter fabric.

2.1.4 Identification Storage and Handling

Filter fabric shall be identified, stored and handled in accordance with ASTM D 4873.

2.2 COMPONENTS FOR STRAW BALES

The straw in the bales shall be stalks from oats, wheat, rye, barley, rice, or from grasses such as byhalia, bermuda, etc., furnished in air dry condition. The bales shall have a standard cross section of 14 inches by 18 inches. All bales shall be either wire-bound or string-tied. The Contractor may use either wooden stakes or steel posts

to secure the straw bales to the ground. Wooden stakes utilized for this purpose, shall have a minimum dimensions of 2 inches x 2 inches in cross section and shall have a minimum length of 3 feet. Steel posts (standard "U" or "T" section) utilized for securing straw bales, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of3 feet.

PART 3 EXECUTION

3.1 INSTALLATION OF SILT FENCES

Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at a support post, with a minimum 6 inch overlap, and securely sealed. A trench shall be excavated approximately 4 inches wide and 4 inches deep on the upslope side of the location of the silt fence. The 4-inch by 4-inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the Contracting Officer.

3.2 INSTALLATION OF STRAW BALES

Straw bales shall be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. Straw bales shall be installed so that bindings are oriented around the sides rather than along the tops and bottoms of the bales in order to prevent deterioration of the bindings. The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. After the bales are staked and chinked (gaps filled by wedging with straw), the excavated soil shall be backfilled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be built up to 4 inches against the uphill side of the barrier. Loose straw shall be scattered over the area immediately uphill from a straw bale barrier to increase barrier efficiency. Each bale shall be securely anchored by at least two stakes driven through the bale. The first stake or steel post in each bale shall be driven toward the previously laid bale to force the bales together. Stakes or steel pickets shall be driven a minimum 18 inches deep into the ground to securely anchor the bales.

3.3 MAINTENANCE

The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures.

3.3.1 Silt Fence Maintenance

Silt fences shall be inspected in accordance with paragraph INSPECTIONS. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become

ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with SECTION 02921 SEEDING, except that the coverage requirements in paragraph ESTABLISHMENT do not apply.

3.3.2 Straw Bale Maintenance

Straw bale barriers shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damaged bales, end runs and undercutting beneath bales. Necessary repairs to barriers or replacement of bales shall be accomplished promptly. Sediment deposits shall be removed when deposits reach one-half of the height of the barrier.
Bale rows used to retain sediment shall be turned uphill at each end of each row. When a straw bale barrier is no longer required, it shall be removed. The immediate area occupied by the bales and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with SECTION 02921 SEEDING.

3.3.3 Diversion Dike Maintenance

Diversion dikes shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damaged diversion dikes and necessary repairs shall be accomplished promptly. When diversion dikes are no longer required, they shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with SECTION 02921 SEEDING.

3.4 INSPECTIONS

3.4.1 General

The Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and area where vehicles exit the site at least once every seven (7) calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Where sites have been finally stabilized, such inspection shall be conducted at least once every month.

3.4.2 Inspections Details

Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the Storm Water Pollution Prevention Plan shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.

3.4.3 Inspection Reports

For each inspection conducted, the Contractor shall prepare a report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the Storm Water Pollution Prevention Plan, maintenance performed, and actions taken. The report shall be furnished to the Contracting Officer within 24 hours of the inspection as a part of the Contractor's daily CQC REPORT. A copy of the inspection report shall be maintained on the job site.

3.5 ATTACHMENTS

EPA Form 3510-9

EPA Form 3510-13

This Form Replaces Form 3510-9 (8-98)
Refer to the Following Pages for Instructions

Form Approved OMB Nos. 2040-0188 and 2040-0211

NPDES Form

United States Environmental Protection Agency
Washington, DC 20460

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

Submission of this Notice of Intent (NOI) constitutes notice that the party identified in Section II of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) permit number identified in Section I of this form. Submission of this NOI also constitutes notice that the party identified in Section II of this form meets the eligibility requirements of the CGP for the project identified in Section III of this form. Permit coverage is required prior to commencement of construction activity until you are eligible to terminate coverage as detailed in the CGP. To obtain authorization, you must submit a complete and accurate NOI form. Refer to the instructions at the end of this form.

I. Permit Number

II. Operator Information

Name:

IRS Employer Identification Number (EIN): -

Mailing Address:

Street:

City: State: Zip Code: -

Phone: - - Fax (optional): - -

E-mail (optional):

III. Project/Site Information

Project/Site Name:

Project Street/Location:

City: State: Zip Code: -

County or similar government subdivision:

Latitude/Longitude (Use one of three possible formats, and specify method)

Latitude
1. _ _° _ _ ´ _ _ ´´ N (degrees, minutes, seconds)
2. _ _° _ _ . _ _ ´ N (degrees, minutes, decimal)
3. _ _ . _ _ _ _° N (decimal)

Longitude
1. _ _ _° _ _ ´ _ _ ´´ W (degrees, minutes, seconds)
2. _ _ _° _ _ . _ _ ´ W (degrees, minutes, decimal)
3. _ _ _ . _ _ _ _° W (decimal)

Method: ☐ U.S.G.S. topographic map EPA web site GPS Other:
• If you used a U.S.G.S. topographic map, what was the scale: _____

Project Located in Indian country? ☐ Yes ☐ No
If so, name of Reservation or if not part of a Reservation, put "Not Applicable": _____

Estimated Project Start Date: / / (Month Date Year) Estimated Project Completion Date: / / (Month Date Year)

Estimated Area to be Disturbed (to the nearest quarter acre): .

IV. SWPPP Information

Has the SWPPP been prepared in advance of filing this NOI? Yes No

Location of SWPPP for viewing: Address in Section II Address in Section III Other

If Other:

SWPPP Street: _____

City: _____

State: _____ Zip Code: _____ - _____

SWPPP Contact Information (if different than that in Section II):

Name: _____

Phone: _____ - _____ - _____ Fax (optional): _____ - _____ - _____

E-mail (optional): _____

V. Discharge Information

Identify the name(s) of waterbodies to which you discharge. _____

_____

Is this discharge consistent with the assumptions and requirements of applicable EPA approved or established TMDL(s)?

Yes No

VI. Endangered Species Information

Under which criterion of the permit have you satisfied your ESA eligibility obligations?

A B C D E F

- If you select criterion F, provide permit tracking number of operator under which you are certifying eligibility:

_____

VII. Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name: _____

Print Title: _____

Signature: _____

Date: _____

Instructions for Completing EPA Form 3510-9

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

NPDES Form This Form Replaces Form 3510-9 (8/98) Form Approved OMB Nos. 2040-0188 and 2040-0211

Who Must File an NOI Form

Under the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et.seq.; the Act), federal law prohibits storm water discharges from certain construction activities to waters of the U.S. unless that discharge is covered under a National Pollutant Discharge Elimination System (NPDES) Permit. Operator(s) of construction sites where one or more acres are disturbed, smaller sites that are part of a larger common plan of development or sale where there is a cumulative disturbance of at least one acre, or any other site specifically designated by the Director, must submit an NOI to obtain coverage under an NPDES general permit. Each person, firm, public organization, or any other entity that meets either of the following criteria must file this form: (1) they have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) they have day-to-day operational control of those activities at the project necessary to ensure compliance with SWPPP requirements or other permit conditions. If you have questions about whether you need an NPDES storm water permit, or if you need information to determine whether EPA or your state agency is the permitting authority, refer to *www.epa.gov/npdes/stormwater/cgp* or telephone the Storm Water Notice Processing Center at (866) 352-7755.

Where to File NOI Form

See the applicable CGP for information on where to send your completed NOI form.

Completing the Form

Obtain and read a copy of the appropriate EPA Storm Water Construction General Permit for your area. To complete this form, type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks (abbreviate if necessary to stay within the number of characters allowed for each item). Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, refer to *www.epa.gov/npdes/stormwater/cgp* or telephone the Storm Water Notice Processing Center at (866) 352-7755. Please submit original document with signature in ink - do not send a photocopied signature.

Section I. Permit Number

Provide the number of the permit under which you are applying for coverage (see Appendix B of the general permit for the list of eligible permit numbers).

Section II. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application. An operator of a project is a legal entity that controls at least a portion of site operations and is not necessarily the site manager. Provide the employer identification number (EIN from the Internal Revenue Service; IRS), also commonly referred to as your taxpayer ID. If the applicant does not have an EIN enter "NA" in the space provided. Also provide the operator's mailing address, telephone number, fax number (optional) and e-mail address (if you would like to be notified via e-mail of NOI approval when available). Correspondence for the NOI will be sent to this address.

Section III. Project/Site Information

Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for permit coverage to be granted.

The applicant must also provide the latitude and longitude of the facility either in degrees, minutes, seconds; degrees, minutes, decimal; or decimal format. The latitude and longitude of your facility can be determined in several different ways, including through the use of global positioning system (GPS) receivers, U.S. Geological Survey (U.S.G.S.) topographic or quadrangle maps, and EPA's web-based siting tools, among others. Refer to *www.epa.gov/npdes/stormwater/cgp* for further guidance on the use of these methodologies. For consistency, EPA requests that measurements be taken from the approximate center of the construction site. Applicants must specify which method they used to determine latitude and longitude. If a U.S.G.S. topographic map is used, applicants are required to specify the scale of the map used.

Indicate whether the project is in Indian country, and if so, provide the name of the Reservation. If the project is in Indian Country Lands that are not part of a Reservation, indicate "not applicable" in the space provided.

Enter the estimated construction start and completion dates using four digits for the year (i.e., 05/27/1998). Enter the estimated area to be disturbed including but not limited to: grubbing, excavation, grading, and utilities and infrastructure installation. Indicate to the nearest quarter acre. Note: 1 acre = 43,560 sq. ft.

Section IV. SWPPP Information

Indicate whether or not the SWPPP was prepared in advance of filing the NOI form. Check the appropriate box for the location where the SWPPP may be viewed. Provide the name,

Instructions for Completing EPA Form 3510-9

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

NPDES Form This Form Replaces Form 3510-9 (8/98) Form Approved OMB Nos. 2040-0188 and 2040-0211

fax number (optional), and e-mail address (optional) of the contact person if different than that listed in Section II of the NOI form.

Section V. Discharge Information

Enter the name(s) of receiving waterbodies to which the project's storm water will discharge. These should be the first bodies of water that the discharge will reach. (Note: If you discharge to more than one waterbody, please indicate all such waters in the space provided and attach a separate sheet if necessary.) For example, if the discharge leaves your site and travels through a roadside swale or a storm sewer and then enters a stream that flows to a river, the stream would be the receiving waterbody. Waters of the U.S. include lakes, streams, creeks, rivers, wetlands, impoundments, estuaries, bays, oceans, and other surface bodies of water within the confines of the U.S. and U.S. coastal waters. Waters of the U.S. do not include man-made structures created solely for the purpose of wastewater treatment. U.S. Geological Survey topographical maps may be used to make this determination. If the map does not provide a name, use a format such as "unnamed tributary to Cross Creek". If you discharge into a municipal separate storm sewer system (MS4), you must identify the waterbody into which that portion of the storm sewer discharges. That information should be readily available from the operator of the MS4.

Indicate whether your storm water discharges from construction activities will be consistent with the assumptions and requirements of applicable EPA approved or established TMDL(s). To answer this question, refer to *www.epa.gov/npdes/stormwater/cgp* for state- and regional-specific TMDL information related to the construction general permit. You may also have to contact your EPA regional office or state agency. If there are no applicable TMDLs or no related requirements, please check the "yes" box in the NOI form.

Section VI. Endangered Species Information

Indicate for which criterion (i.e., A, B, C, D, E, or F) of the permit the applicant is eligible with regard to protection of federally listed endangered and threatened species, and designated critical habitat. See Part 1.3.C.6 and Appendix C of the permit. If you select criterion F, provide the permit tracking number of the operator under which you are certifying eligibility. The permit tracking number is the number assigned to the operator by the Storm Water Notice Processing Center after EPA acceptance of a complete NOI.

Section VII. Certification Information

All applications, including NOIs, must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name and title of the person signing the form and the date of signing. An unsigned or undated NOI form will not be considered eligible for permit coverage.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 3.7 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch 2136, U.S. Environmental Protection, Agency, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

This Form Replaces Form 3517-7 (8-98)
Refer to the Following Page for Instructions

Form Approved OMB Nos. 2040-0086 and 2040-0211

NPDES Form

United States Environmental Protection Agency
Washington, DC 20460

Notice of Termination (NOT) of Coverage Under an NPDES General Permit for Storm Water Discharges Associated with Construction Activity

Submission of this Notice of Termination constitutes notice that the party identified in Section II of this form is no longer authorized to discharge storm water associated with construction activity under the NPDES program from the site identified in Section III of this form. All necessary information must be included on this form. Refer to the instructions at the end of this form.

I. Permit Information

NPDES Storm Water General Permit Tracking Number: _____

Reason for Termination (Check only one):

Final stabilization has been achieved on all portions of the site for which you are responsible.

Another operator has assumed control, according to Appendix G, Section 11.C of the CGP, over all areas of the site that have not been finally stabilized.

Coverage under an alternative NPDES permit has been obtained.

For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

II. Operator Information

Name: _____

IRS Employer Identification Number (EIN): ___ - _____

Mailing Address:

Street: _____

City: _____ State: ___ Zip Code: _____ - ____

Phone: ___ - ___ - ____ Fax (optional): ___ - ___ - ____

E-mail (optional): _____

III. Project/Site Information

Project/Site Name: _____

Project Street/Location: _____

City: _____ State: ___ Zip Code: _____ - ____

County or similar government subdivision: _____

IV. Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name: _____

Print Title: _____

Signature: _____

Date: _____

Instructions for Completing EPA Form 3510-13

Notice of Termination (NOT) of Coverage Under an NPDES General Permit for Storm Water Discharges Associated with Construction Activity

NPDES Form This Form Replaces Form 3517-7 (8-98) Form Approved OMB Nos. 2040-0086 and 2040-0211

Who May File an NOT Form

Permittees who are presently covered under the EPA-issued National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity may submit an NOT form when final stabilization has been achieved on all portions of the site for which you are responsible; another operator has assumed control in accordance with Appendix G, Section 11.C of the General Permit over all areas of the site that have not been finally stabilized; coverage under an alternative NPDES permit has been obtained; or for residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

"Final stabilization" means that all soil disturbing activities at the site have been completed and that a uniform perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed. See "final stabilization" definition in Appendix A of the Construction General Permit for further guidance where background native vegetation covers less than 100 percent of the ground, in arid or semi-arid areas, for individual lots in residential construction, and for construction projects on land used for agricultural purposes.

Completing the Form

Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, refer to *www.epa.gov/npdes/stormwater/cgp* or telephone the Storm Water Notice Processing Center at (866) 352-7755. Please submit original document with signature in ink - do not send a photocopied signature.

Section I. Permit Number

Enter the existing NPDES Storm Water General Permit Tracking Number assigned to the project by EPA's Storm Water Notice Processing Center. If you do not know the permit tracking number, refer to *www.epa.gov/npdes/stormwater/cgp* or contact the Storm Water Notice Processing Center at (866) 352-7755.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box. Check only one:

Final stabilization has been achieved on all portions of the site for which you are responsible.

Another operator has assumed control according to Appendix G, Section 11.C over all areas of the site that have not been finally stabilized.

Coverage under an alternative NPDES permit has been obtained.

For residential construction only, if temporary stabilization has been completed and the residence has been transferred to the homeowner.

Section II. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application and is covered by the permit tracking number identified in Section I. The operator of the project is the legal entity that controls the site operation, rather than the site manager. Provide the employer identification number (EIN from the Internal Revenue Service; IRS). If the applicant does not have an EIN enter "NA" in the space provided. Enter the complete mailing address and telephone number of the operator. *Optional:* enter the fax number and e-mail address of the operator.

Section III. Project/Site Information

Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for termination of permit coverage to be valid.

Section IV. Certification Information

All applications, including NOIs, must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name and title of the person signing the form and the date of signing. An unsigned or undated NOT form will not be considered valid termination of permit coverage.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 0.5 hours per notice, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460. Include the OMB number on any correspondence. Do not sent the completed form to this address.

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01411

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 SCOPE
1.2 APPLICABLE REGULATIONS
1.3 SUBMITTALS
1.4 LAND RESOURCES
1.4.1 General
1.4.2 Protection of Landscape
1.5 AIR POLLUTION
1.6 NOTIFICATION
1.7 SUBCONTRACTORS
1.8 IMPLEMENTATION
1.9 MAINTENANCE OF POLLUTION CONTROL FACILITIES

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 WATER FOR DUST CONTROL/SOIL COMPACTION
3.2 CERTIFICATES FOR CONSTRUCTION
3.3 ATTACHMENTS

-- End of Section Table of Contents --

SECTION 01411

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 SCOPE

This section covers protection of environmental resources exposed to potential effects from construction activities.

1.2 APPLICABLE REGULATIONS

In order to prevent, and provide for abatement and control of, environmental pollution arising from the construction activities of the Contractor or its subcontractors in the performance of the work, they shall comply with applicable Federal, State, and local laws and regulations concerning environmental pollution control and abatement, as well as applicable provisions of the Safety and Health Requirements Manual referenced in paragraph ACCIDENT PREVENTION of SECTION 00700 CONTRACT CLAUSES.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Environmental Pollution Control

1.4 LAND RESOURCES

1.4.1 General

For the purposes of this section, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic and recreational purposes. Land resources within the project boundaries and outside the limits of the work shall be preserved in their undisturbed condition or be restored to a condition after completion of construction that will appear natural and not detract from the appearance of the area. Insofar as possible, the Contractor shall confine its construction activities to areas defined by the plans or specifications. The following requirements are in addition to those specified in paragraph PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS; OPERATIONS AND STORAGE AREAS; and paragraph CLEANING UP, of SECTION 00700 CONTRACT CLAUSES.

1.4.2 Protection of Landscape

The Contractor shall not deface, injure, or destroy trees, shrubs, or other landscaping, or remove or cut same without permission from the Contracting Officer. The Contractor shall minimize impacts to the existing landscape in selecting sites for field offices and storage areas.

1.5 AIR POLLUTION

The Contractor shall maintain excavations, embankments, stockpiles, haul roads, permanent and temporary access roads, and all other work areas within or outside the project boundaries free from dust, which would cause a hazard or nuisance. Sprinkling or similar methods shall be employed to control dust. If sprinkling is used, the Contractor shall retain sufficient, suitable equipment at the site and repeat applications at such intervals as to keep all parts of the disturbed area damp at all times 24-hours/day, 7-days/week. As a minimum, one water truck and one street sweeper shall be on-site at all times except when freezing weather precludes sprinkling. Dust control shall be performed as the work proceeds. There shall be no visible dust coming off any portion of the work site at any time, or off any vehicle hauling material for the Contractor. In addition, the Contractor shall ensure that no material of any type will fall off any vehicle while in transit. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away. No separate or direct payment will be made for dust control and the cost thereof shall be considered incidental to and included in the contract price.

1.6 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any noncompliance with the foregoing provisions and the action to be taken. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or its authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop order shall be made the subject of a claim of extension of time or for excess costs or damages by the Contractor.

1.7 SUBCONTRACTORS

Compliance with the provisions of this section by subcontractors will be the responsibility of the prime Contractor.

1.8 IMPLEMENTATION

Prior to commencement of work, the Contractor shall:

a. Submit in writing its proposals for implementing this section for environmental pollution control.

b. Meet with representatives of the Contracting Officer to develop mutual understandings relative to compliance with this provision and administration of the environmental pollution control program.

1.9 MAINTENANCE OF POLLUTION CONTROL FACILITIES

The Contractor shall maintain facilities constructed for pollution control as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created. During construction, the Contractor shall conduct frequent training courses for its maintenance personnel, covering methods of detecting pollution, familiarity with pollution standards, and installation and care of vegetation covers, plants and other facilities to prevent and correct pollution.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 WATER FOR DUST CONTROL/SOIL COMPACTION

The Contractor is advised that water for Dust Control and soil compaction efforts shall be obtained from Building 3003. Use of fire hydrants at Fort Wainwright is no longer permitted.

3.2 CERTIFICATES FOR CONSTRUCTION

The Government has obtained the following permits for use by the Contractor (see attached documents) for this project.

Certificate for Construction - Public Water Systems
Certificate for Construction - Domestic Waste Disposal Systems
Certificate for Construction - Domestic Waste Water Systems

3.3 ATTACHMENTS

ADEC Permit Package

Cover Letter
Certificate for Construction - Public Water Systems
Certificate for Construction - Domestic Waste Disposal Systems
Certificate for Construction - Domestic Waste Water Systems

STATE OF ALASKA

FRANK MURKOWSKI, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL HEALTH
NORTHERN DRINKING WATER/WASTEWATER PROGRAM
610 UNIVERSITY AVENUE
FAIRBANKS, ALASKA 99709-3643
http://www.state.ak.us/dec/home.htm

Telephone: (907) 451-5193
Fax: (907) 451-2188
Linda_Taylor@envircon.state.ak.us

File Number: 108.07.016
108.45.011
PWSID# 310918

December 16, 2002

Mr. Steve Geppert
US Army Corp of Engineers, Alaska District
P.O. Box 898
Anchorage, AK 99506-898

Re: Ft. Wainwright Utilities Upgrade, Phase 3
Approval to Construct Water Distribution Lines
Approval to Construct Wastewater Collection Lines

Dear Mr. Geppert:

On November 8, 2002 the Department received your submittal requesting construction approval for the replacement of approximately 1900 linear feet of water distribution and wastewater collection lines. A new lift station with force main will be constructed at manhole #2. This phase of utility line replacement is between manhole #7 and manhole #288A. The project is approved with the condition that all by-pass water lines must be constructed using ANSI/NSF 61 approved for potable water pipes. Enclosed is an **Approval to Construct** for both the water and wastewater lines.

In order to received final operational approval, please submit the following upon completion of construction:

Water:

1. A set of record drawings, stamped and signed by the inspecting registered engineer. These may be submitted on a CD.
2. A copy of the bacteriological test result taken after the distribution lines have been disinfected and flushed.
3. Verification that only ANSI/NSF 61 materials were used in the construction of the water lines.

Wastewater:

1. A set of record drawings, stamped and signed by the inspecting registered engineer. These may be submitted on a CD.
2. A completed Certification of Construction Form (blank enclosed).

Approval of submitted plans is not approval of omissions or oversights by this office or noncompliance with any applicable regulation.

The Department's construction approval does not guarantee correctness of functional design or waive the owner's responsibility for continued compliance with state regulations. The construction approval is valid for two years from the date of this letter. Within 90 days of completion of this project an accurate set of record drawings must be submitted to the Department. Upon receipt of the record drawings and fulfillment of above stated conditions, Operational Approval will be granted.

Sincerely,

Linda L. Taylor

Linda L. Taylor, P.E.
DW/WW Engineer

LT/XD (G:/eh/engineer/plans/Ft. Wainwright Utilities Upgrade Phase 3.doc)

Enclosures: Approval to Construct Public Water System
Approval to Construct Domestic Wastewater Disposal System
Certification of Construction form

cc: Cindy Christian, ADEC, DW/WW Program Coordinator, Fairbanks

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CONSTRUCTION AND OPERATION CERTIFICATE
FOR
PUBLIC WATER SYSTEMS

A. APPROVAL TO CONSTRUCT

Plans for the construction or modification of **Ft. Wainwright Utilities - replacement of approximately 1900 linear feet of water main (Phase 3)**, a **Class "A"** Public Water System, located in **Ft. Wainwright , Alaska**, submitted in accordance with 18 AAC 80.205 by **Steve Geppert, U.S. Corp of Engineers** have been reviewed and are

☒ **approved as submitted** ☐ **conditionally approved (see attached conditions)**

Linda L. Taylor	Environmental Engineer	December 16
(Reviewing Engineer)	(Title)	(Date of Approval)

If applicant fails to construct, alter, install, or modify the system within two years of the date of approval to construct, approval is void, and plans must be resubmitted for Department review and approval.

B. APPROVED CHANGE ORDERS

Change (contract order number or descriptive reference)

(Reviewing Engineer)	(Title)	(Date of Approval)

C. APPROVAL TO OPERATE

The **"Interim Approval to Operate"** section must be completed and signed by the Department before any water is made available for public use.

Interim Approval to Operate:

The construction of _____, a **Class " "** Public Water System was completed on _____. The system is hereby granted ***INTERIM APPROVAL TO OPERATE*** for 90 days following the completion date. It is illegal to operate a public water system beyond 90 days without **Final Approval to Operate** from the Department.

(Reviewing Engineer)	(Title)	(Date of Approval)

Final Approval to Operate:

Record drawings and other documents submitted to the Department, or an inspection by the Department, has confirmed that the public water system was constructed in substantial conformance with the approved plans. The system is hereby granted ***FINAL APPROVAL TO OPERATE.***

(Reviewing Engineer)	(Title)	(Date of Approval)

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CONSTRUCTION AND OPERATION CERTIFICATE
FOR
DOMESTIC WASTEWATER DISPOSAL SYSTEMS

A. APPROVAL TO CONSTRUCT

Plans for the construction or modification of **Ft. Wainwright Utilities - Replace approximately 1900 linear feet of gravity sewer main and construct a lift station at Manhole #2 with force main** domestic wastewater disposal system, located in **Ft. Wainwright, Alaska**, submitted in accordance with 18 AAC 72.200 through 18 AAC 72.235 by **Steve Geppert, U. S. Corp of Engineers** have been reviewed and are

☒ **approved as submitted** ☐ **conditionally approved (see attached conditions)**

Linda L. Taylor	Environmental Engineer	December 16, 2002
(Reviewing Engineer)	(Title)	(Date of Approval)

If applicant fails to construct, alter, install, or modify the system within two years of the date of approval to construct, approval is void, and plans must be resubmitted for Department review and approval.

B. APPROVED CHANGE ORDERS

Change (contract order number or descriptive reference)

(Reviewing Engineer)	(Title)	(Date of Approval)

C. APPROVAL TO OPERATE

The **"Interim Approval to Operate"** section must be completed and signed by the Department before this domestic wastewater disposal system is made available for use.

Interim Approval to Operate:

The construction of _____ domestic wastewater disposal system was completed on _____. The system is hereby granted ***INTERIM APPROVAL TO OPERATE*** for 90 days following the completion date. It is illegal to operate the domestic wastewater disposal system beyond 90 days without **Final Approval to Operate** from the Department.

(Reviewing Engineer)	(Title)	(Date of Approval)

Final Approval to Operate:

Record drawings and other documents submitted to the Department, or an inspection by the Department, has confirmed that the domestic wastewater disposal system was constructed in substantial conformance with the approved plans. The system is hereby granted ***FINAL APPROVAL TO OPERATE***.

(Reviewing Engineer)	(Title)	(Date of Approval)

State of Alaska
Department of Environmental Conservation
610 University Avenue
Fairbanks, AK 99709-3643

CERTIFICATION OF CONSTRUCTION FOR DOMESTIC WASTEWATER SYSTEMS

Instructions:

1. Within 30 days after the construction, installation, or modification of a project is completed, the owner, the contractor(s) responsible for constructing the project, and a registered engineer responsible for construction inspection, must complete and sign this form declaring that the project was constructed in accordance with the most recent Department-approved plans, or in accordance with the attached as-built drawings.

2. If a project is being completed in phased construction, a map shall be attached showing that portion of the project being declared completed on the date stated in the Owner's Section. Completion of each phase of a project must be declared as it is completed. Additional Certification of Construction forms are available from any Department of Environmental Conservation office.

Please type or print, except for signature: **SECTION A-** Owner's Section

Name and brief description of project: _____

_____

Name of Owner: _____ ADEC Project No. _____

Address: _____ Date Project Completed: ____/____/____

_____

_____

I certify that I am the owner of the above-referenced project. I further certify that this project was constructed in accordance with the latest plans submitted to and approved by the Alaska Department of Environmental Conservation (ADEC), or in accordance with the attached as-built drawings. I understand that I may be required to take remedial measures to correct any construction which was completed without prior ADEC approval, which departs from the approved plans, and which is found to be inconsistent with the applicable requirements of ADEC wastewater disposal regulations (18 AAC 72).

_____

Signature of Owner (Please Sign in Ink) **Date**

SECTION B- Contractor's Section

I certify that I (or an individual under my direct supervision) have conducted an inspection of the project referenced in Section A, or portions of the project which I had the responsibility for constructing, and that to the best of my knowledge and information, the project, or those portions, was or were constructed in accordance with the latest plans submitted to and approved by the Alaska Department of Environmental Conservation, or in accordance with the attached as-built drawings.

Name of Contractor	**Signature of Contractor** (please sign in ink)	**Date**

For multiple contractors, if applicable:

Name of Contractor	**Signature of Contractor** (please sign in ink)	**Date**

Name of Contractor	**Signature of Contractor** (please sign in ink)	**Date**

SECTION C- Engineer's Section

I certify that I (or any individual under my direct supervision) have conducted an inspection of the above referenced project, and that to the best of my knowledge and information, the project was constructed in accordance with: (check one of the following)

☐ the latest plans submitted to and approved by the Alaska Department of Environmental Conservation

or

☐ in accordance with the attached as-built drawings.

Signature of Professional Engineer Responsible for Construction Inspection (Please Sign in Ink)	State of Alaska Professional Engineer Registration Number	Date

Typed or Printed Name of Professional Engineer

--END OF SECTION--

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01420

SOURCES FOR REFERENCE PUBLICATIONS

PART 1 GENERAL

1.1 REFERENCES
1.2 ORDERING INFORMATION

-- End of Section Table of Contents --

SECTION 01420

SOURCES FOR REFERENCE PUBLICATIONS

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization, (e.g. ASTM B 564 Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number.

ACI INTERNATIONAL (ACI)
P.O. Box 9094
Farmington Hills, MI 48333-9094
Ph: 248-848-3700
Fax: 248-848-3701
E-mail: bkstore@concrete.org
Internet: http://www.aci-int.org

ALUMINUM ASSOCIATION (AA)

900 19th Street NW, Suite 300
Washington, DC 20006
Ph: 202-862-5100
Fax: 202-862-5164
Internet: http://www.aluminum.org

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
444 North Capital Street NW, Suite 249
Washington, DC 20001
Ph: 202-624-5800
Fax: 202-624-5806
E-Mail: info@aashto.org
Internet: http://www.aashto.org

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)
1330 Kemper Meadow Drive

Cincinnati, OH 45240
Ph: 513-742-2020
Fax: 513-742-3355
E-mail: mail@acgih.org
Internet: http://www.acgih.org

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)
One East Wacker Drive, Suite 3100
Chicago, IL 60601-2001
Ph: 312-670-2400
Fax: 312-670-5403
Publications: 800-644-2400
E-mail: pubs@aisc.org
Internet: http://www.aisc.org

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
1819 L Street NW, 6th Floor
Washington, DC 20036
Ph: 202-293-8020
Fax: 202-293-9287
E-mail: info@ansi.org
Internet: http://www.ansi.org/

Note --- Documents beginning with the letter "S" can be ordered from:

Acoustical Society of America (ASA)
2 Huntington Quadrangle, Suite 1NO1
Melville, NY 11747-4502
Ph: 516-576-2360
Fax: 516-576-2377
E-mail: asa@aip.org
Internet: http://asa.aip.org

AMERICAN NURSERY AND LANDSCAPE ASSOCIATION (ANLA)
1000 Vermont Avenue NW, Suite 300
Washington, DC 20005-4914
Ph: 202-789-2900
Fax: 202-789-1893
Internet: http://www.anla.org

AMERICAN SOCIETY FOR NONDESTRUCTIVE TESTING (ASNT)
1711 Arlingate Lane
P.O. Box 28518
Columbus, OH 43228-0518
Ph: 800-222-2768; 614-274-6003
Fax: 614-274-6899
E-mail: webmaster@asnt.org
Internet: http://www.asnt.org

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)
1801 Alexander Bell Drive
Reston, VA 20191-4400
Ph: 703-295-6300 or 800-548-2723
Fax: 703-295-6222
E-mail: marketing@asce.org
Internet: http://www.asce.org

AMERICAN WATER WORKS ASSOCIATION(AWWA)

6666 West Quincy Avenue
Denver, CO 80235
Ph: 303-794-7711
Fax: 303-347-0804
Internet: http://www.awwa.org

AMERICAN WELDING SOCIETY (AWS)
550 N.W. LeJeune Road
Miami, FL 33126
Ph: 305-443-9353 or 800-443-9353
Fax: 305-443-7559
E-mail: info@aws.org
Internet: http://www.aws.org

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)
P.O. Box 388
Selma, AL 36702-0388
Ph: 334-874-9800
Fax: 334-874-9008
E-mail: email@awpa.com
Internet: http://www.awpa.com

ASME INTERNATIONAL (ASME)
Three Park Avenue
New York, NY 10016-5990
Ph: 212-591-7722
Fax: 212-591-7674
E-mail: infocentral@asme.org
Internet: http://www.asme.org

ASTM INTERNATIONAL (ASTM)
100 Barr Harbor Drive
P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 610-832-9500
Fax: 610-832-9555
E-mail: service@astm.org
Internet: http://www.astm.org

CODE OF FEDERAL REGULATIONS (CFR)
U.S. Government Printing Office
732 N. Capitol Street NW
Washington, DC 20401
Ph: 202-512-1530 or 888-293-6498
Fax: 202-512-1262

COMPRESSED GAS ASSOCIATION (CGA)
4221 Walney Road, 5th Floor
Chantilly, VA 20151-2923
Ph: 703-788-2700
Fax: 703-961-1831
E-mail: cga@cganet.com
Internet: http://www.cganet.com

CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
933 North Plum Grove Road
Schaumburg, IL 60173-4758
Ph: 847-517-1200
Fax: 847-517-1206

Internet: http://www.crsi.org

EXPANSION JOINT MANUFACTURERS ASSOCIATION (EJMA)
25 North Broadway
Tarrytown, NY 10591
Ph: 914-332-0040
Fax: 914-332-1541
E-mail: ejma@ejma.org
Internet: http://www.ejma.org

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)
445 Hoes Lane
Piscataway, NJ 08855-1331
Ph: 732-981-0060
Fax: 732-981-1712
E-mail: customer.services@ieee.org
Internet: http://www.ieee.org

INTERNATIONAL CODE COUNCIL (ICC)
5203 Leesburg Pike, Suite 600
Falls Church, VA 22041
Ph: 703-931-4533
Fax: 703-379-1546
E-mail: webmaster@iccsafe.org
Internet: http://www.intlcode.org

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)
127 Park Street, NE
Vienna, VA 22180-4602
Ph: 703-281-6613
Fax: 703-281-6671
E-mail: info@mss-hq.com
Internet: http://www.mss-hq.com

NACE INTERNATIONAL (NACE)
1440 South Creek Drive
Houston, TX 77084-4906
Ph: 281-228-6200
Fax: 281-228-6300
Internet: http://www.nace.org

NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)
8 South Michigan Avenue, Suite 1000
Chicago, IL 60603
Ph: 312-322-0405
Fax: 312-332-0706
E-mail: naamm@gss.net
Internet: http://www.naamm.org

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
1300 North 17th Street, Suite 1847
Rosslyn, VA 22209
Ph: 703-841-3200
Fax: 703-841-3300
E-mail: webmaster@nema.org
Internet: http://www.nema.org

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
Ph: 617-770-3000
Fax: 617-770-0700
E-mail: webmaster@nfpa.org
Internet: http://www.nfpa.org

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)
Mail Stop C-13
4676 Columbia Parkway
Cincinnati, OH 45226-1998
Ph: 800-356-4674
Fax: 513-533-8573
E-mail: pubstaff@cdc.gov
Internet: http://www.cdc.gov/niosh/homepage.html

NATIONAL READY MIXED CONCRETE ASSOCIATION (NRMCA)
900 Spring Street
Silver Spring, MD 20910
Ph: 301-587-1400
Fax: 301-585-4219
Internet: http://www.nrmca.org

NSF INTERNATIONAL (NSF)
789 North Dixboro Road
P.O. Box 130140
Ann Arbor, MI 48113-0140
Ph: 734-769-8010
Fax: 734-769-0109 or 800-NSF-MARK
E-mail: info@nsf.org
Internet: http://www.nsf.org

SCIENTIFIC CERTIFICATION SYSTEMS (SCS)
2000 Powell Street, Suite 1350
Emeryville, CA 94608
Ph: 510-452-8000
Fax: 510-452-8001
E-mail: webmaster@scscertified.com
Internet: http://www.scs1.com

STATE OF ALASKA ADMINISTRATIVE CODE (AAC)
Touch N' Go Systems Inc.
406 G Street, Suite 210
Anchorage, AK 99501
Ph: 907-264-6333
Fax: 907-274-9493
Internet: http://touchngo.com//lglcntr

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES (ADOT&PF)
Alaska Department of Transportation & Public Facilities
Office of the Commissioner
3132 Channel Drive
Juneau, AK 99801-7898
Ph: 907-465-3900

STATE OF ALASKA STATUTES (AS)
Touch N' Go Systems Inc.

406 G Street, Suite 210
Anchorage, AK 99501
Ph: 907-264-6333
Fax: 907-274-9493
Internet: http://touchngo.com/lglcntr

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)
40 24th Street, 6th Floor
Pittsburgh, PA 15222-4656
Ph: 412-281-2331
Fax: 412-281-9992
Internet: http://www.sspc.org

UNDERWRITERS LABORATORIES (UL)
333 Pfingsten Road
Northbrook, IL 60062-2096
Ph: 847-272-8800
Fax: 847-272-8129
E-mail: northbrook@us.ul.com
Internet: http://www.ul.com

U.S. ARMY (DA)
U.S. Army Publications Directorate
Internet: http://www.usapa.army.mil

U.S. ARMY CORPS OF ENGINEERS (USACE)
Order CRD-C DOCUMENTS from:
U.S. Army Engineer Waterways Experiment Station
ATTN: Technical Report Distribution Section, Services Branch, TIC
3909 Halls Ferry Rd.
Vicksburg, MS 39180-6199
Ph: 601-634-2664
Fax: 601-634-2388
E-mail: mtc-info@erdc.usace.army.mil
Internet: http://www.wes.army.mil/SL/MTC/handbook.htm

Order Other Documents from:
USACE Publications Depot
Attn: CEIM-SP-D
2803 52nd Avenue
Hyattsville, MD 20781-1102
Ph: 301-394-0081
Fax: 301-394-0084
E-mail: pubs-army@usace.army.mil
Internet: http://www.usace.army.mil/publications or http://www.hnd.usace.army.mil/techinfo/engpubs.htm

U.S. DEPARTMENT OF AGRICULTURE (USDA)
Order AMS Publications from:
AGRICULTURAL MARKETING SERVICE (AMS)
Seed Regulatory and Testing Branch
801 Summit Crossing Place, Suite C
Gastonia, NC 28054-2193
Ph: 704-810-8870
Fax: 704-852-4189
E-mail: seed.ams@usda.gov
Internet: http://www.ams.usda.gov/lsg/seed.htm

Order Other Publications from:
U.S. Department of Agriculture, Rural Utilities Service
14th and Independence Avenue, SW, Room 4028-S
Washington, DC 20250
Ph: 202-720-2791
Fax: 202-720-2166
Internet: http://www.usda.gov

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)
Order from:
HUD User
P.O. Box 23268
Washington, DC 20026-3268
Ph: 800-245-2691
Fax: 202-708-9981
E-mail: Huduser@aspensys.com
Internet: http://www.huduser.org

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
Ariel Rios Building
1200 Pennsylvania Avenue NW
Washington, DC 20460
Ph: 202-260-2090
Fax: 202-260-6257
Internet: http://www.epa.gov

NOTE --- Some documents are available only from:
National Technical Information Services (NTIS)
5285 Port Royal Road
Springfield, VA 22161
Ph: 703-605-6000
Fax: 703-605-6900
E-mail: webmaster@ntis.gov
Internet: http://www.ntis.gov

U.S. GENERAL SERVICES ADMINISTRATION (GSA)
General Services Administration
1800 F Street NW
Washington, DC 20405
Ph: 202-501-1021

Order from:
General Services Administration
Federal Supply Service Bureau
1941 Jefferson Davis Highway
Arlington, VA 22202
Ph: 703-605-5400
Internet: http://apps.fss.gsa.gov/pub/fedspecs/index.cfm

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
8601 Adelphi Road
College Park, MD 20740-6001
Ph: 866-272-6272
Fax: 301-837-0483
Internet: http://www.archives.gov

Order documents from:
Superintendent of Documents
U.S.Government Printing Office

Washington, DC 20402-9325
Ph: 866-512-1800 or 202-512-1800
Fax: 202-512-2250
E-mail: gpoinfo@gpo.gov
Internet: http://www.gpo.gov

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01451

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.1 REFERENCES
1.2 PAYMENT

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS
3.2 QUALITY CONTROL PLAN
3.2.1 Content of the CQC Plan
3.2.2 Acceptance of Plan
3.2.3 Notification of Changes
3.3 COORDINATION MEETING
3.4 QUALITY CONTROL ORGANIZATION
3.4.1 Personnel Requirements
3.4.2 CQC System Manager
3.4.3 CQC Personnel
3.4.4 Additional Requirement
3.4.5 Organizational Changes
3.5 SUBMITTALS AND DELIVERABLES
3.6 CONTROL
3.6.1 Preparatory Phase
3.6.2 Initial Phase
3.6.3 Follow-up Phase
3.6.4 Additional Preparatory and Initial Phases
3.7 TESTS
3.7.1 Testing Procedure
3.7.2 Testing Laboratories
3.7.2.1 Capability Check
3.7.2.2 Capability Recheck
3.7.3 Onsite Laboratory
3.7.4 Furnishing or Transportation of Samples for Testing
3.8 COMPLETION INSPECTION
3.8.1 Punch-Out Inspection
3.8.2 Pre-Final Inspection
3.8.3 Final Acceptance Inspection
3.9 DOCUMENTATION
3.10 SAMPLE FORMS
3.11 NOTIFICATION OF NONCOMPLIANCE

3.12 ATTACHMENTS

-- End of Section Table of Contents --

SECTION 01451

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 3740	(2001) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E 329	(2000b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a

physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

3.2 QUALITY CONTROL PLAN

The Contractor shall furnish for review by the Government, not later than 30 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.1 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with SECTION 01330 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities approved by the Contracting Officer shall be used.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.3 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 30 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure safety and contract compliance. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a construction person with a minimum of 7 years in related work. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned no other duties. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

3.4.3 CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: electrical, mechanical, civil, environmental. The electrical and mechanical individuals shall be directly employed by the prime Contractor; be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals shall have no other duties other than quality control.

The civil and environmental individuals may be employees of the prime or subcontractor; shall be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These two individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan. The electrical and mechanical engineers shall be physically present at the construction site at all times during work in their areas of responsibility.

Experience Matrix

	Area	Qualifications
a.	Civil	Graduate Civil Engineer with 2 years experience in the type of work being performed on this project or technician with 5 yrs related experience
b.	Mechanical	Graduate Mechanical Engineer with 2 yrs experience or person with 5 yrs related experience
c.	Electrical	Graduate Electrical Engineer with 2 yrs related experience or person with 5 yrs related experience
d.	Environmental	Graduate Environmental Engineer with 3 yrs experience

3.4.4 Additional Requirement

In addition to the above experience and/or education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". This course is periodically offered at the Associated General Contractors of Alaska Office in Anchorage and Fairbanks.

3.4.5 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, shall be made as specified in SECTION 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of the construction work as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

a. A review of each paragraph of applicable specifications, reference codes, and standards. A copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by Government personnel until final acceptance of the work.

b. A review of the contract drawings.

c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. A review of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. The Government shall be notified at least 48 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government shall be notified at least 24 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. A list of all tests required by contract shall be furnished as part of the QC Plan. This list shall give the test name, specification section and paragraph reference requiring the test, frequency, the personnel and/or laboratories responsible for each type of test, with an estimated number of tests required. The Contractor shall perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed actual costs to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to a laboratory to be designated by the Contracting Officer.

Coordination for each specific test, exact delivery location, and dates will be made through the Area Office.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. A punch list of items which do not conform to the approved drawings and specifications shall be prepared and included in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into

increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

a. Contractor/subcontractor and their area of responsibility.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.

g. Offsite surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and

instructions or corrective actions.

i. Instructions given/received and conflicts in plans and/or specifications.

j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 SAMPLE FORMS

Sample forms enclosed at the end of this section.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.12 ATTACHMENTS

CQC Report

CONTRACTOR'S QUALITY CONTROL REPORT (CQC) (ER 1180-1-6)	DATE	REPORT NO.
CONTRACT NO. AND NAME OF CONTRACTOR:	DESCRIPTION AND LOCATION OF THE WORK:	

WEATHER CLASSIFICATION:

CLASS A No interruption of any kind from weather conditions occurring on this or previous shifts.
CLASS B Weather occurred during this shift that caused a complete stoppage of all work.
CLASS C Weather occurred during this shift that caused a partial stoppage of work.
CLASS D Weather overhead excellent or suitable during shift. Work completely stopped due to results of previous adverse weather.
CLASS E Weather overhead excellent or suitable during shift but work partially stopped due to previous adverse manner.
OTHER Explain.

CLASSIFICATION:

CLASS _____

TEMPERATURE:

MAX ____ MIN ____

PRECIPITATION:

INCHES _____

CONTRACTOR/SUBCONTRACTORS AND AREA OF RESPONSIBILITY FOR WORK PERFORMED TODAY: (Attach list of items of equipment either idle or working as appropriate.)

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____

1. WORK PERFORMED TODAY: (Indicate location and description of work performed. Refer to work performed by prime and/or subcontractors by letter in Table above.)

2. TYPE AND RESULTS OF INSPECTION: (Indicate whether P-Prepatory, I-Initial, or F-Followup and include satisfactory work completed or deficiencies with action to be taken.)

3. TESTS REQUIRED BY PLANS AND/OR SPECIFICATIONS PERFORMED AND RESULTS OF TESTS:

4. VERBAL INSTRUCTIONS RECEIVED: (List any instructions given by Government personnel on construction deficiencies, retesting required, etc., with action to be taken.)

5. REMARKS: (Cover any conflicts in plans, specifications or instructions: acceptability of incoming materials; offsite surveillance activities; progress of work, delays, causes and extent thereof; days of no work with reasons for same.)

6. SAFETY: (Include any infractions of approved safety plan, safety manual, or instructions from Government personnel. Specify correctve action taken).

CONTRACTOR: _____

CONTRACTOR'S CERTIFICATION: I certify that the above report is complete and correct and that all material and equipment used, work performed and tests conducted during this reporting period were in strict compliance with the contract plans and specifications except as noted above.

_____
CONTRACTOR'S APPROVED AUTHORIZED REPRESENTATIVE

--END OF SECTION--

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01500

TEMPORARY CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS
1.1.1 Site Plan
1.1.2 Identification of Employees
1.1.3 Employee Parking
1.2 AVAILABILITY AND USE OF UTILITY SERVICES
1.2.1 Payment for Utility Services
1.2.2 Meters and Temporary Connections
1.2.3 Final Meter Reading
1.2.4 Sanitation
1.2.5 Telephone
1.3 BULLETIN BOARD
1.4 PROTECTION AND MAINTENANCE OF TRAFFIC
1.4.1 Haul Roads
1.4.2 Dust Control
1.4.2.1 Transportation of Construction Debris
1.4.2.2 Temporary Roads, Soil Excavations, Stockpiles and Graded Areas
1.4.3 Barricades
1.5 CONTRACTOR'S TEMPORARY FACILITIES
1.5.1 Administrative Field Offices
1.5.2 Storage Area
1.5.3 Supplemental Storage Area
1.5.4 Appearance of Trailers
1.5.5 Maintenance of Storage Area
1.5.6 New Building
1.5.7 Security Provisions
1.6 PLANT COMMUNICATION
1.7 TEMPORARY PROJECT SAFETY FENCING
1.8 CLEANUP
1.9 RESTORATION OF STORAGE AREA

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

-- End of Section Table of Contents --

SECTION 01500

TEMPORARY CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

1.1.1 Site Plan

The Contractor shall prepare a site plan indicating the proposed location and dimensions of any area to be fenced and used by the Contractor, the number of trailers to be used, avenues of ingress/egress to the fenced area and details of the fence installation. Any areas which may have to be graveled to prevent the tracking of mud shall also be identified. The Contractor shall also indicate if the use of a supplemental or other staging area is desired.

1.1.2 Identification of Employees

The Contractor shall be responsible for furnishing to each employee, and for requiring each employee engaged on the work to display, identification as approved and directed by the Contracting Officer. Prescribed identification shall immediately be delivered to the Contracting Officer for cancellation upon release of any employee. When required, the Contractor shall obtain and provide fingerprints of persons employed on the project. Contractor and subcontractor personnel shall wear identifying markings on hard hats clearly identifying the company for whom the employee works.

1.1.3 Employee Parking

Contractor employees shall park privately owned vehicles in an area designated by the Contracting Officer. This area will be within reasonable walking distance of the construction site. Contractor employee parking shall not interfere with existing and established parking requirements of the military installation.

1.2 AVAILABILITY AND USE OF UTILITY SERVICES

1.2.1 Payment for Utility Services

The Government will make all reasonably required utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

Utility	Maximum Amount	Cost
Water	Reasonable	$4.2731/kGal
Electricity	Reasonable	$0.0841/kWH

Utility	Maximum Amount	Cost
Sewage	Reasonable	$7.0551/kGAL
Landfill Use	Reasonable	$60.00/TON
Steam	Reasonable	$11.1217/kLB

1.2.2 Meters and Temporary Connections

The Contractor, at its expense and in a manner satisfactory to the Contracting Officer, shall provide and maintain necessary temporary connections, distribution lines, meter bases, and meters required to measure the amount of each utility used for the purpose of determining charges. The Contractor shall notify the Contracting Officer, in writing, 5 working days before final electrical connection is desired so that a utilities contract can be established.

Water for dust control, water distributors and compaction must come from water point at bldg 3003. Fire hydrants are not allowed to be used for obtaining water or providing temporary water service on sites. Water service on site must come through temporary connection to permanent water distribution system or piping.

1.2.3 Final Meter Reading

Before completion of the work and final acceptance of the work by the Government, the Contractor shall notify the Contracting Officer, in writing, 5 working days before termination is desired. The Government will take a final meter reading. The Contractor shall then remove all the temporary distribution lines, meter bases, and meters. The Contractor shall pay all outstanding utility bills before final acceptance of the work by the Government.

1.2.4 Sanitation

The Contractor shall provide and maintain within the construction area minimum field-type sanitary facilities approved by the Contracting Officer. Government toilet facilities will not be available to Contractor's personnel.

1.2.5 Telephone

The Contractor shall make arrangements and pay all costs for telephone facilities desired.

1.3 BULLETIN BOARD

Immediately upon beginning of work, the Contractor shall provide a weatherproof glass-covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, and other information approved by the Contracting Officer. The bulletin board shall be located at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer. Legible copies of the aforementioned data shall be displayed until work is completed. Upon completion of work the bulletin board shall be removed by and remain the property of the Contractor.

1.4 PROTECTION AND MAINTENANCE OF TRAFFIC

During construction the Contractor shall provide access and temporary

relocated roads as necessary to maintain traffic. The Contractor shall maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the State and local authorities having jurisdiction. The traveling public shall be protected from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with public traffic. The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations.

1.4.1 Haul Roads

The Contractor shall, at its own expense, construct access and haul roads necessary for proper prosecution of the work under this contract. Haul roads shall be constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. The Contractor shall provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control, although optional, shall be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads shall be subject to approval by the Contracting Officer. Lighting shall be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations. Upon completion of the work, haul roads designated by the Contracting Officer shall be removed.

1.4.2 Dust Control

1.4.2.1 Transportation of Construction Debris

All construction debris shall be disposed of in accordance with SECTION 01015 SPECIAL ITEMS paragraph DISPOSITION OF MATERIALS. The Contractor shall ensure that each load is covered properly and that no dust is visible during transportation of the construction debris to its final location. Prevention methods shall be as outlined in SECTION 01411 ENVIRONMENTAL PROTECTION.

1.4.2.2 Temporary Roads, Soil Excavations, Stockpiles and Graded Areas

The Contractor shall maintain all temporary roads, excavations, stockpiles and graded areas such that no dust is visible during the performance of this contract. Prevention methods shall be as outlined in SECTION 01411 ENVIRONMENTAL PROTECTION.

1.4.3 Barricades

The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during

both day and night.

1.5 CONTRACTOR'S TEMPORARY FACILITIES

1.5.1 Administrative Field Offices

The Contractor shall provide and maintain administrative field office facilities within the construction area at the designated site. Government office and warehouse facilities will not be available to the Contractor's personnel.

1.5.2 Storage Area

The Contractor shall construct a temporary 6 foot high chain link fence around trailers and materials. The fence shall include plastic strip inserts, colored green, so that visibility through the fence is obstructed. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit. Trailers, materials, or equipment shall not be placed or stored outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the Contracting Officer away from the vicinity of the construction site but within the military boundaries. Trailers, equipment, or materials shall not be open to public view with the exception of those items which are in support of ongoing work on any given day. Materials shall not be stockpiled outside the fence in preparation for the next day's work. Mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment, shall be parked within the fenced area at the end of each work day.

1.5.3 Supplemental Storage Area

Upon Contractor's request, the Contracting Officer will designate another or supplemental area for the Contractor's use and storage of trailers, equipment, and materials. This area may not be in close proximity of the construction site but shall be within the military boundaries. Fencing of materials or equipment will not be required at this site; however, the Contractor shall be responsible for cleanliness and orderliness of the area used and for the security of any material or equipment stored in this area. Utilities will not be provided to this area by the Government.

1.5.4 Appearance of Trailers

Trailers utilized by the Contractor for administrative or material storage purposes shall present a clean and neat exterior appearance and shall be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on the military property.

1.5.5 Maintenance of Storage Area

Fencing shall be kept in a state of good repair and proper alignment. Should the Contractor elect to traverse, with construction equipment or other vehicles, grassed or unpaved areas which are not established roadways, such areas shall be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways; gravel gradation shall be at the Contractor's discretion. Grass located within the boundaries of the construction site shall be mowed for the duration of the project. Grass and

vegetation along fences, buildings, under trailers, and in areas not accessible to mowers shall be edged or trimmed neatly.

1.5.6 New Building

In the event a new building is constructed for the temporary project field office, it shall be a minimum 12 feet in width, 16 feet in length and have a minimum of 7 feet headroom. It shall be equipped with approved electrical wiring, at least one double convenience outlet and the required switches and fuses to provide 110-120 volt power. It shall be provided with a work table with stool, desk with chair, two additional chairs, and one legal size file cabinet that can be locked. The building shall be waterproof, shall be supplied with heater, shall have a minimum of two doors, electric lights, a telephone, a battery operated smoke detector alarm, a sufficient number of adjustable windows for adequate light and ventilation, and a supply of approved drinking water. Approved sanitary facilities shall be furnished. The windows and doors shall be screened and the doors provided with dead bolt type locking devices or a padlock and heavy duty hasp bolted to the door. Door hinge pins shall be non-removable. The windows shall be arranged to open and to be securely fastened from the inside. Glass panels in windows shall be protected by bars or heavy mesh screens to prevent easy access to the building through these panels. In warm weather, air conditioning capable of maintaining the office at 50 percent relative humidity and a room temperature 20 degrees F below the outside temperature when the outside temperature is 95 degrees F, shall be furnished. Any new building erected for a temporary field office shall be maintained by the Contractor during the life of the contract and upon completion and acceptance of the work shall become the property of the Contractor and shall be removed from the site. All charges for telephone service for the temporary field office shall be borne by the Contractor, including long distance charges.

1.5.7 Security Provisions

Adequate outside security lighting shall be provided at the Contractor's temporary facilities. The Contractor shall be responsible for the security of its own equipment; in addition, the Contractor shall notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

1.6 PLANT COMMUNICATION

Whenever the Contractor has the individual elements of its plant so located that operation by normal voice between these elements is not satisfactory, the Contractor shall install a satisfactory means of communication, such as telephone or other suitable devices. The devices shall be made available for use by Government personnel.

1.7 TEMPORARY PROJECT SAFETY FENCING

As soon as practicable, but not later than 15 days after the date established for commencement of work, the Contractor shall furnish and erect temporary project safety fencing at the work site. The safety fencing shall be a high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 42 inches high, supported and tightly secured to steel posts located on maximum 10 foot centers, constructed at the approved location. The safety fencing shall be maintained by the Contractor during the life of the contract and,

upon completion and acceptance of the work, shall become the property of the Contractor and shall be removed from the work site.

1.8 CLEANUP

Construction debris, waste materials, packaging material and the like shall be removed from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away. Materials resulting from demolition activities which are salvageable shall be stored within the fenced area described above or at the supplemental storage area. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored.

1.9 RESTORATION OF STORAGE AREA

Upon completion of the project and after removal of trailers, materials, and equipment from within the fenced area, the fence shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition. Gravel used to traverse grassed areas shall be removed and the area restored to its original condition, including top soil and seeding as necessary.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01525

SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 DEFINITIONS
1.4 REGULATORY REQUIREMENTS
1.5 DRUG PREVENTION PROGRAM
1.6 SITE QUALIFICATIONS, DUTIES AND MEETINGS
1.6.1 Personnel Qualifications
1.6.1.1 Site Safety and Health Officer (SSHO)
1.6.1.2 Competent Person for Confined Space Entry
1.6.1.3 Competent Person for the Health Hazard Control and Respiratory Protection Program
1.6.1.4 Crane Operators
1.6.2 Personnel Duties
1.6.2.1 Site Safety and Health Officer (SSHO)
1.6.3 Meetings
1.6.3.1 Preconstruction Conference
1.6.3.2 Weekly Safety Meetings
1.6.3.3 Work Phase Meetings
1.7 TRAINING
1.7.1 New Employee Indoctrination
1.7.2 Periodic Training
1.7.3 Training on Activity Hazard Analysis (AHA)
1.8 ACCIDENT PREVENTION PLAN (APP)
1.8.1 EM 385-1-1 Contents
1.9 ACTIVITY HAZARD ANALYSIS (AHA)
1.10 DISPLAY OF SAFETY INFORMATION
1.11 SITE SAFETY REFERENCE MATERIALS
1.12 EMERGENCY MEDICAL TREATMENT
1.13 REPORTS
1.13.1 Accident Reports
1.13.2 Accident Notification
1.13.3 Monthly Exposure Reports
1.13.4 Regulatory Citations and Violations
1.13.5 Crane Reports
1.14 HOT WORK

PART 2 PRODUCTS

2.1 CONFINED SPACE SIGNAGE

PART 3 EXECUTION

3.1 CONSTRUCTION AND/OR OTHER WORK
3.1.1 Hazardous Material Use

3.1.2 Hazardous Material Exclusions
3.1.3 Unforeseen Hazardous Material
3.2 PRE-OUTAGE COORDINATION MEETING
3.3 FALL HAZARD PROTECTION AND PREVENTION PROGRAM
3.3.1 Training
3.3.2 Fall Protection Equipment
3.3.2.1 Personal Fall Arrest Equipment
3.4 EQUIPMENT
3.4.1 Material Handling Equipment
3.4.2 Weight Handling Equipment
3.4.3 Equipment and Mechanized Equipment
3.5 EXCAVATIONS
3.5.1 Utility Locations
3.5.2 Utility Location Verification
3.5.3 Utilities with Concrete Slabs
3.5.4 Shoring Systems
3.5.5 Trenching Machinery
3.6 ELECTRICAL
3.6.1 Conduct of Electrical Work
3.6.2 Portable Extension Cords
3.7 WORK IN CONFINED SPACES
3.8 CRYSTALLINE SILICA
3.9 HOUSEKEEPING
3.9.1 Clean-Up
3.9.2 Falling Object Protection

-- End of Section Table of Contents --

SECTION 01525

SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z359.1	(1992; R 1999) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

ASME INTERNATIONAL (ASME)

ASME B30.22	(2000) Articulating Boom Cranes
ASME B30.5	(2000) Mobile and Locomotive Cranes

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2002) Portable Fire Extinguishers
NFPA 241	(2000) Safeguarding Construction,Alteration, and Demolition Operations
NFPA 70	(2002) National Electrical Code

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2003) Safety and Health Requirements Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1910.94	Ventilation
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.500	Fall Protection

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G

Activity Hazard Analysis (AHA); G

Proof of qualification for Crane Operators; G

SD-06 Test Reports

Reports

Submit reports as their incidence occurs, in accordance with the requirements of the paragraph entitled, "Reports."

Accident Reports

Monthly Exposure Reports

Regulatory Citations and Violations

Crane Reports

SD-07 Certificates

Confined Space Entry Permit

Submit one copy of each permit attached to each Daily Quality Control Report.

1.3 DEFINITIONS

a. Competent Person for Fall Protection. A person who is capable of identifying hazardous or dangerous conditions in the personal fall arrest system or any component thereof, as well as their application and use with related equipment, and has the authority to take prompt corrective measures to eliminate the hazards of falling.

b. High Visibility Accident. Any mishap which may generate publicity and/or high visibility.

c. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

d. Multi-Employer Work Site (MEWS). A multi-employer work site, as defined by OSHA, is one in which many employers occupy the same site. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the

subcontractors.

e. Operating Envelope. The area surrounding any crane. Inside this "envelope" is the crane, the operator, riggers, rigging gear between the hook and the load, the load and the crane's supporting structure (ground, rail, etc.).

f. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:

(1) Death, regardless of the time between the injury and death, or the length of the illness;

(2) Days away from work;

(3) Restricted work;

(4) Transfer to another job;

(5) Medical treatment beyond first aid;

(6) Loss of consciousness; or

(7) A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

g. Site Safety and Health Officer (SSHO). The competent person who is responsible for the on-site safety and health required for the project.

h. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.

i. Weight Handling Equipment (WHE) Accident. A WHE accident occurs when any one or more of the six elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; and collision, including unplanned contact between the load, crane, and/or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over, etc.).

1.4 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, work performed shall comply with USACE EM 385-1-1, and the following federal, state, and local, rules and regulations. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.5 DRUG PREVENTION PROGRAM

Conduct a proactive drug and alcohol use prevention program for all workers, prime and subcontractor, on the site. Ensure that no employee uses illegal drugs or consumes alcohol during work hours. Ensure there are no employees under the influence of drugs or alcohol during work hours. After accidents, collect blood, urine, or saliva specimens and test the injured and involved employees for the influence of drugs and alcohol. A copy of the test shall be made available to the Contracting Officer upon request.

1.6 SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.6.1 Personnel Qualifications

1.6.1.1 Site Safety and Health Officer (SSHO)

Site Safety and Health Officer (SSHO) shall be provided at the work site at all times to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor. The SSHO shall meet the following requirements:

Level 4:
A minimum of 10 years safety work of a progressive nature with at least 5 years of experience on similar projects.
30-hour OSHA construction safety class or equivalent within the last 5 years.
An average of at least 24 hours of formal safety training each year for the past 5 years with training for competent person status for at least the following 5 areas of competency: Excavation; Hazardous energy; Confined space; Health hazard recognition; Personal protective equipment and clothing to include selection, use and maintenance.

1.6.1.2 Competent Person for Confined Space Entry

Provide a competent person meeting the requirements of EM 385-1-1 who is assigned in writing by the Designated Authority to assess confined spaces and who possesses demonstrated knowledge, skill and ability to:

a. Identify the structure, location, and designation of confined and permit-required confined spaces where work is done;

b. Calibrate and use testing equipment including but not limited to, oxygen indicators, combustible gas indicators, carbon monoxide indicators, and carbon dioxide indicators, and to interpret accurately the test results of that equipment;

c. Perform all required tests and inspections specified in 29 CFR 1910.146 and 29 CFR 1915 Subpart B;

d. Assess hazardous conditions including atmospheric hazards in confined space and adjacent spaces and specify the necessary protection and precautions to be taken;

e. Determine ventilation requirements for confined space entries and operations;

f. Assess hazards associated with hot work in confined and

adjacent space and determine fire watch requirements; and,

g. Maintain records required.

1.6.1.3 Competent Person for the Health Hazard Control and Respiratory Protection Program

Provide a competent person meeting the requirements of EM 385-1-1 who is:

a. Capable by education, specialized training and/or experience of anticipating, recognizing, and evaluating employee exposure to hazardous chemical, physical and biological agents in accordance with USACE EM 385-1-1, Section 6.

b. Capable of specifying necessary controls and protective actions to ensure worker health.

1.6.1.4 Crane Operators

Crane operators shall meet the requirements in USACE EM 385-1-1, Section 16 and Appendix G.

1.6.2 Personnel Duties

1.6.2.1 Site Safety and Health Officer (SSHO)

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Safety inspection logs shall be attached to the Contractors' daily quality control report.

b. Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 and Daily Production reports for prime and sub-contractors.

c. Maintain applicable safety reference material on the job site.

d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.

e. Implement and enforce accepted APPS and AHAs.

f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. A list of unresolved safety and health deficiencies shall be posted on the safety bulletin board.

g. Ensure sub-contractor compliance with safety and health requirements.

Failure to perform the above duties will result in dismissal of the SSHO, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

1.6.3 Meetings

1.6.3.1 Preconstruction Conference

a. The Contractor will be informed, in writing, of the date of the preconstruction conference. The purpose of the preconstruction conference is for the Contractor and the Contracting Officer's representatives to become acquainted and explain the functions and operating procedures of their respective organizations and to reach mutual understanding relative to the administration of the overall project's Accident Prevention Plan (APP) before the initiation of work.

b. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall attend the preconstruction conference. This includes the project superintendent, site safety and health officer, quality control supervisor, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

c. The Contractor shall discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, a schedule for the preparation, submittal, review, and acceptance of AHAs shall be established to preclude project delays.

d. Deficiencies in the submitted APP will be brought to the attention of the Contractor at the preconstruction conference, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Work shall not begin until there is an accepted APP.

1.6.3.2 Weekly Safety Meetings

Conduct weekly safety meetings at the project site for all employees. The Contracting Officer will be informed of the meeting in advance and be allowed attendance. Minutes showing contract title, signatures of attendees and a list of topics discussed shall be attached to the Contractors' daily quality control report.

1.6.3.3 Work Phase Meetings

The appropriate AHA shall be reviewed and attendance documented by the Contractor at the preparatory, initial, and follow-up phases of quality control inspection. The analysis should be used during daily inspections to ensure the implementation and effectiveness of safety and health controls.

1.7 TRAINING

1.7.1 New Employee Indoctrination

New employees (prime and sub-contractor) will be informed of specific site hazards before they begin work. Documentation of this orientation shall be kept on file at the project site.

1.7.2 Periodic Training

Provide Safety and Health Training in accordance with USACE EM 385-1-1 and the accepted APP. Ensure all required training has been accomplished for all onsite employees.

1.7.3 Training on Activity Hazard Analysis (AHA)

Prior to beginning a new phase, training will be provided to all affected employees to include a review of the AHA to be implemented.

1.8 ACCIDENT PREVENTION PLAN (APP)

The Contractor shall use a qualified person to prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Preparation of Accident Prevention Plan". Where a paragraph or subparagraph element is not applicable to the work to be performed indicate "Not Applicable" next to the heading. Specific requirements for some of the APP elements are described below at paragraph 1.8.1. The APP shall be job-specific and shall address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Any portions of the Contractor's overall safety and health program referenced in the APP shall be included in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer and any designated CSP and/or CIH.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. The Contracting Officer reviews and comments on the Contractor's submitted APP and accepts it when it meets the requirements of the contract provisions.

Once accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and quality control manager. Should any unforeseen hazard become evident during the performance of work, the project superintendent shall inform the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, all necessary action shall be taken by the Contractor to restore and maintain safe working conditions in order to safeguard onsite personnel,

visitors, the public, and the environment.

Copies of the accepted plan will be maintained at the resident engineer's office and at the job site. The APP shall be continuously reviewed and amended, as necessary, throughout the life of the contract. Unusual or high-hazard activities not identified in the original APP shall be incorporated in the plan as they are discovered.

1.8.1 EM 385-1-1 Contents

In addition to the requirements outlines in Appendix A of USACE EM 385-1-1, the following is required:

a. Names and qualifications (resumes including education, training, experience and certifications) of all site safety and health personnel designated to perform work on this project to include the designated site safety and health officer and other competent and qualified personnel. The duties of each position shall be specified.

b. Qualifications of competent and of qualified persons. As a minimum, competent persons shall be designated and qualifications submitted for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; personal protective equipment and clothing to include selection, use and maintenance.

c. Confined Space Entry Plan. Develop a confined space entry plan in accordance with USACE EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders.

d. Health Hazard Control Program. The Contractor shall designate a competent and qualified person to establish and oversee a Health Hazard Control Program in accordance with USACE EM 385-1-1, Section 6. The program shall ensure that employees, on-site Government representatives, and others, are not adversely exposed to chemical, physical and biological agents and that necessary controls and protective actions are instituted to ensure health.

e. Alcohol and Drug Abuse Plan

(1) Describe plan for random checks and testing with pre-employment screening in accordance with the DFAR Clause subpart 252.223-7004, "Drug Free Work Force."

(2) Description of the on-site prevention program

f. Fall Protection and Prevention (FP&P) Plan. The plan shall be site specific and address all fall hazards in the work place and during different phases of construction. It shall address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A qualified person for fall protection shall prepare and sign the plan. The plan shall

include fall protection and prevention systems, equipment and methods employed for every phase of work, responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Fall Protection and Prevention Plan shall be revised for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. The accepted Fall Protection and Prevention Plan shall be kept and maintained at the job site for the duration of the project. The Fall Protection and Prevention Plan shall be included in the Accident Prevention Plan (APP).

g. Training Records and Requirements. List of mandatory training and certifications which are applicable to this project (e.g. explosive actuated tools, confined space entry, fall protection, crane operation, vehicle operator, forklift operators, personal protective equipment); list of requirements for periodic retraining/certification; outline requirements for supervisory and employee safety meetings.

h. Occupant Protection Plan. The safety and health aspects of lead-based paint removal, prepared in accordance with Section 13281 LEAD HAZARD CONRTROL ACTIVITIES.

i. Asbestos Hazard Abatement Plan. The safety and health aspects of asbestos work, prepared in accordance with Section 13280 ASBESTOS ABATEMENT.

j. Site Demolition Plan. The safety and health aspects prepared in accordance with Section 02220 DEMOLITION and referenced sources.

k. Excavation Plan. The safety and health aspects prepared in accordance with Section 02300 EARTHWORK.

1.9 ACTIVITY HAZARD ANALYSIS (AHA)

The Activity Hazard Analysis (AHA) format shall be in accordance with USACE EM 385-1-1. Submit the AHA for review at least 15 calendar days prior to the start of each phase. Format subsequent AHA as amendments to the APP. An AHA will be developed by the Contractor for every operation involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or subcontractor is to perform work. The analysis must identify and evaluate hazards and outline the proposed methods and techniques for the safe completion of each phase of work. At a minimum, define activity being performed, sequence of work, specific safety and health hazards anticipated, control measures (to include personal protective equipment) to eliminate or reduce each hazard to acceptable levels, equipment to be used, inspection requirements, training requirements for all involved, and the competent person in charge of that phase of work. For work with fall hazards, including fall hazards associated with scaffold erection and removal, identify the appropriate fall protection methods used. For work with materials handling equipment, address safeguarding measures related to materials handling equipment. For work requiring excavations, include requirements for safeguarding excavations. An activity requiring an AHA shall not proceed until the AHA has been accepted by the Contracting Officer's representative and a meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activity, including on-site Government representatives.

The Contractor shall document meeting attendance at the preparatory, initial, and follow-up phases of quality control inspection. The AHA shall be continuously reviewed and, when appropriate, modified to address changing site conditions or operations. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

Activity hazard analyses shall be updated as necessary to provide an effective response to changing work conditions and activities. The on-site superintendent, site safety and health officer and competent persons used to develop the AHAs, including updates, shall sign and date the AHAs before they are implemented.

1.10 DISPLAY OF SAFETY INFORMATION

Within 1 calendar days after commencement of work, erect a safety bulletin board at the job site. The following information shall be displayed on the safety bulletin board in clear view of the on-site construction personnel, maintained current, and protected against the elements and unauthorized removal:

a. Map denoting the route to the nearest emergency care facility.

b. Emergency phone numbers.

c. Copy of the most up-to-date APP.

d. Current AHA(s).

e. OSHA 300A Form.

f. OSHA Safety and Health Protection-On-The-Job Poster.

g. Confined space entry permit.

h. Safety and Health Warning Posters.

1.11 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in the article "References." Maintain applicable equipment manufacturer's manuals.

1.12 EMERGENCY MEDICAL TREATMENT

Contractors will arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.13 REPORTS

1.13.1 Accident Reports

a. For recordable injuries and illnesses, and property damage accidents resulting in at least $2,000 in damages, the Prime

Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the USACE Accident Report Form 3394 and provide the report to the Contracting Officer within 1 calendar day of the accident. The Contracting Officer will provide copies of any required or special forms.

b. For any weight handling equipment accident the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the WHE Accident Report form and provide the report to the Contracting Officer within 30 calendar days of the accident.

1.13.2 Accident Notification

Notify the Contracting Officer as soon as practical, but not later than four hours, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than $2,000, or any weight handling equipment accident. Information shall include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted.

1.13.3 Monthly Exposure Reports

Monthly exposure reporting to the Contracting Officer is required to be attached to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. The Contracting Officer will provide copies of any special forms.

1.13.4 Regulatory Citations and Violations

Contact the Contracting Officer immediately of any OSHA or other regulatory agency inspection or visit, and provide the Contracting Officer with a copy of each citation, report, and contractor response. Correct violations and citations promptly and provide written corrective actions to the Contracting Officer.

1.13.5 Crane Reports

Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix H and as specified herein with Daily Reports of Inspections.

1.14 HOT WORK

Prior to performing "Hot Work" (welding, cutting, etc.) or operating other flame-producing/spark producing devices, a written permit shall be requested from the Fire Dept. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. The Contractor will provide at least two (2) twenty (20) pound 4A:20 BC rated extinguishers for normal "Hot Work". All extinguishers shall be current inspection tagged, approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity.

a. Oil painting materials (paint, brushes, empty paint cans, etc.), and all flammable liquids shall be removed from the facility at quitting time. All painting materials and flammable liquids shall be stored outside in a suitable metal locker or box and will require re-submittal with non-hazardous materials.

b. Accumulation of trays, paper, shavings, sawdust, boxes and other packing materials shall be removed from the facility at the close of each workday and such material disposed of in the proper containers located away from the facility.

c. The storage of combustible supplies shall be a safe distance from structures.

d. Area outside the facility undergoing work shall be cleaned of trash, paper, or other discarded combustibles at the close of each workday.

e. All portable electric devices (saws, sanders, compressors, extension chord, lights, etc.) shall be disconnected at the close of each workday. When possible, the main electric switch in the facility shall be deactivated.

f. When starting work in the facility, Contractors shall require their personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Department phone number. ANY FIRE, NO MATTER HOW SMALL, SHALL BE REPORTED.

PART 2 PRODUCTS

2.1 CONFINED SPACE SIGNAGE

The Contractor shall provide permanent signs integral to or securely attached to access covers for new permit-required confined spaces. Signs wording: "DANGER--PERMIT-REQUIRED CONFINED SPACE - DO NOT ENTER -" in bold letters a minimum of 1 inch in height and constructed to be clearly legible with all paint removed. The signal word "DANGER" shall be red and readable from 5 feet.

PART 3 EXECUTION

3.1 CONSTRUCTION AND/OR OTHER WORK

The Contractor shall comply with USACE EM 385-1-1, NFPA 241, the APP, the AHA, Federal and/or State OSHA regulations, and other fire and safety regulations. The most stringent standard shall prevail.

3.1.1 Hazardous Material Use

Each hazardous material must receive approval prior to being brought onto the job site or prior to any other use in connection with this contract. Allow a minimum of 10 working days for processing of the request for use of a hazardous material. Any work or storage involving hazardous chemicals or materials must be done in a manner that will not expose Government or Contractor employees to any unsafe or unhealthful conditions. Adequate protective measures must be taken to prevent Government or Contractor employees from being exposed to any hazardous

condition that could result from the work or storage. The Prime Contractor shall keep a complete inventory of hazardous materials brought onto the work-site. Approval by the Contracting Officer of protective measures and storage area is required prior to the start of the work.

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with USACE EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocynates, & lead-based paint are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials.

3.1.3 Unforeseen Hazardous Material

The design should have identified materials such as PCB, lead based paint, and friable and non-friable asbestos. If material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to "FAR 52.243-4, Changes" and "FAR 52.236-2, Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Contractors are required to apply for utility outages at least 10 days in advance. As a minimum, the request should include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, the Contractor shall attend a pre-outage coordination meeting with the Contracting Officer and the DPW Utilities Department to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 FALL HAZARD PROTECTION AND PREVENTION PROGRAM

The Contractor shall establish a fall protection and prevention program, for the protection of all employees exposed to fall hazards. The program shall include company policy, identify responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and escape procedures.

3.3.1 Training

The Contractor shall institute a fall protection training program. As part of the Fall Hazard Protection and Prevention Program, the Contractor shall provide training for each employee who might be exposed to fall hazards. A competent person for fall protection shall provide the training. Training requirements shall be in accordance with USACE EM 385-1-1, section 21.A.16.

3.3.2 Fall Protection Equipment

The Contractor shall enforce use of the fall protection equipment designated for each specific work activity in the Fall Protection and Prevention Plan and/or AHA at all times when an employee is on a surface 6 feet or more above lower levels. Fall protection systems such as guardrails, personnel fall arrest system, safety nets, etc., are required when working within 6 feet of any leading edge. Personal fall arrest systems are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall arrest systems are required when operating other equipment such as scissor lifts if the work platform is capable of being positioned outside the wheelbase. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, or travel. Fall protection must comply with 29 CFR 1926.500, Subpart M and USACE EM 385-1-1.

3.3.2.1 Personal Fall Arrest Equipment

Personal fall arrest equipment, systems, subsystems, and components shall meet ANSI Z359.1. Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest device. Body belts may only be used as a positioning device system (for uses such as steel reinforcing assembly and in addition to an approved fall arrest system). Harnesses shall have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Only locking snap hooks and carabiners shall be used. Webbing, straps, and ropes shall be made of synthetic fiber. The maximum free fall distance when using fall arrest equipment shall not exceed 6 feet. The total fall distance and any swinging of the worker (pendulum-like motion) that can occur during a fall shall always be taken into consideration when attaching a person to a fall arrest system.

3.4 EQUIPMENT

3.4.1 Material Handling Equipment

a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.

c. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA.

3.4.2 Weight Handling Equipment

a. Cranes must be equipped with:

(1) Load indicating devices (LIDs) and a boom angle or radius indicator,

(2) or load moment indicating devices (LMIs).

(3) Anti-two block prevention devices.

(4) Boom hoist hydraulic relief valve, disconnect, or shutoff (stops hoist when boom reaches a predetermined high angle).

(5) Boom length indicator (for telescoping booms).

(6) Device to prevent uncontrolled lowering of a telescoping hydraulic boom.

(7) Device to prevent uncontrolled retraction of a telescoping hydraulic boom.

b. The Contractor shall notify the Contracting Officer 15 days in advance of any cranes entering the activity so that necessary quality assurance spot checks can be coordinated. Contractor's operator shall remain with the crane during the spot check.

c. The Contractor shall comply with ASME B30.5 for mobile cranes, & ASME B30.22 for articulating boom cranes.

d. The presence of Government personnel does not relieve the Contractor of an obligation to comply with all applicable safety regulations. The Government will investigate all complaints of unsafe or unhealthful working conditions received in writing from contractor employees, federal civilian employees, or military personnel.

e. Each load shall be rigged/attached independently to the hook/master-link in such a fashion that the load cannot slide or otherwise become detached. Christmas-tree lifting (multiple rigged materials) is not allowed.

f. Under no circumstance shall a Contractor make a lift at or above 90% of the cranes rated capacity in any configuration.

g. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and shall follow the requirements of USACE EM 385-1-1 section 11 and ASME B30.5 or ASME B30.22 as applicable.

h. Crane suspended personnel work platforms (baskets) shall not be used unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Personnel shall not be lifted with a line hoist or friction crane.

i. A fire extinguisher having a minimum rating of 10BC and a minimum nominal capacity of 5lb of extinguishing agent shall be available at all operator stations or crane cabs. Portable fire extinguishers shall be inspected, maintained, and recharged as specified in NFPA 10, Standard for Portable Fire Extinguishers.

j. All employees shall be kept clear of loads about to be lifted and of suspended loads.

k. A weight handling equipment operator shall not leave his position at the controls while a load is suspended.

l. The Contractor shall use cribbing when performing lifts on outriggers.

m. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

n. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the crane.

o. A substantial and durable rating chart containing legible letters and figures shall be provided with each crane and securely mounted onto the crane cab in a location allowing easy reading by the operator while seated in the control station.

p. Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall always be available for review by Contracting Officer personnel.

q. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by Contracting Officer personnel.

r. The Contractor shall certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

3.4.3 Equipment and Mechanized Equipment

a. Equipment shall be operated by designated qualified operators. Proof of qualifications shall be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment shall be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Such additional safety precautions or requirements shall be incorporated into the AHAs.

c. Equipment and mechanized equipment shall be inspected in accordance with manufacturer's recommendations for safe operation by a competent person prior to being placed into use.

d. Daily checks or tests shall be conducted and documented on equipment and mechanized equipment by designated competent persons.

3.5 EXCAVATIONS

The competent person for excavations performed as a result of contract work shall be on-site when excavation work is being performed, and shall inspect, and document the excavations daily prior to entry by workers. The competent person must evaluate all hazards, including atmospheric, that may be associated with the work, and shall have the resources necessary to correct hazards promptly.

3.5.1 Utility Locations

Prior to digging, the appropriate digging permit must be obtained. All underground utilities in the work area must be positively identified by a private utility locating service in addition to any station locating service and coordinated with the station utility department. Any markings made during the utility investigation must be maintained throughout the contract.

3.5.2 Utility Location Verification

The Contractor must physically verify underground utility locations by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system. Digging within 2 feet of a known utility must not be performed by means of mechanical equipment; hand digging shall be used. If construction is parallel to an existing utility the utility shall be exposed by hand digging every 100 feet if parallel within 5 feet of the excavation.

3.5.3 Utilities with Concrete Slabs

Utilities located within concrete slabs or decks, and the like are extremely difficult to identify. The location must be coordinated with station utility departments in addition to a private locating service. Outages on system utilities shall be used in circumstances where concrete chipping, saw cutting, or core drilling is required and utilities are unable to be completely identified.

3.5.4 Shoring Systems

Trench and shoring systems must be identified in the accepted safety plan and AHA. Manufacture tabulated data and specifications or registered engineer tabulated data for shoring or benching systems shall be readily available on-site for review. Job-made shoring or shielding shall have the registered professional engineer stamp, specifications, and tabulated data. Extreme care must be used when excavating near direct burial electric underground cables.

3.5.5 Trenching Machinery

Trenching machines with digging chain drives shall be operated only when the spotters/laborers are in plain view of the operator. Operator and spotters/laborers shall be provided training on the hazards of the digging chain drives with emphasis on the distance that needs to be maintained when the digging chain is operating. Documentation of the training shall be kept on file at the project site.

3.6 ELECTRICAL

3.6.1 Conduct of Electrical Work

Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Positive cable identification must be made prior to submitting any outage request for electrical systems. Arrangements are to be coordinated with the Contracting Officer and Station Utilities for identification. The

Contracting Officer will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. When working in energized substations, only qualified electrical workers shall be permitted to enter. When work requires Contractor to work near energized circuits as defined by the NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves with leather protective sleeves, fire retarding shirts, coveralls, face shields, and safety glasses. In addition, provide electrical arc flash protection for personnel as required. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA.

3.6.2 Portable Extension Cords

Portable extension cords shall be sized in accordance with manufacturer ratings for the tool to be powered and protected from damage. All damaged extension cords shall be immediately removed from service. Portable extension cords shall meet the requirements of NFPA 70.

3.7 WORK IN CONFINED SPACES

The Contractor shall comply with the requirements in Section 06.I of USACE EM 385-1-1 and OSHA 29 CFR 1910.146. Any potential for a hazard in the confined space requires a permit system to be used.

a. Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. (See Section 06.I.05 of USACE EM 385-1-1 for entry procedures.) All hazards pertaining to the space shall be reviewed with each employee during review of the AHA.

b. Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its' action level.

c. Ensure the use of rescue and retrieval devices in confined spaces greater than 5 feet in depth. Conform to Sections 06.I.09, 06.I.10 and 06.I.11 of USACE EM 385-1-1.

d. Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

e. Include training information for employees who will be involved as entrants and attendants for the work. Conform to Section 06.I.06 of USACE EM 385-1-1.

f. Daily Entry Permit. Post the permit in a conspicuous place close to the confined space entrance.

3.8 CRYSTALLINE SILICA

Grinding, abrasive blasting, and foundry operations of construction materials containing crystalline silica, shall comply with OSHA regulations, such as 29 CFR 1910.94, and USACE EM 385-1-1, Appendix C. The Contractor shall develop and implement effective exposure control and elimination procedures to include dust control systems, engineering controls, and establishment of work area boundaries, as well as medical surveillance, training, air monitoring, and personal protective equipment.

3.9 HOUSEKEEPING

3.9.1 Clean-Up

All debris in work areas shall be cleaned up daily or more frequently if necessary. Construction debris may be temporarily located in an approved location, however garbage accumulation must be removed each day.

3.9.2 Falling Object Protection

All areas must be barricaded to safeguard employees. When working overhead, Barricade the area below to prevent entry by unauthorized employees. Construction warning tape and signs shall be posted so they are clearly visible from all possible access points. When employees are working overhead all tools and equipment shall be secured so that they will not fall. When using guardrail as falling object protection, all openings shall be small enough to prevent passage of potential falling objects.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01581

PROJECT MARKER

PART 1 GENERAL

1.1 PROJECT MARKER
1.2 PAYMENT

PART 2 PRODUCTS

2.1 MATERIALS
2.2 SIZE
2.3 FINISH
2.4 DECAL

PART 3 EXECUTION

3.1 INSTALLATION
3.2 MAINTENANCE
3.3 ATTACHMENT

-- End of Section Table of Contents --

SECTION 01581

PROJECT MARKER

PART 1 GENERAL

1.1 PROJECT MARKER

The project marker shall consist of one sign. The sign shall conform to the requirements shown on attached Drawing Number 40-05-12 and the requirements specified herein. Both sides of the sign shall conform to the format on the referenced marker.

1.2 PAYMENT

No separate payment will be made for the project sign. Costs shall be considered incidental to and included in the contract price.

PART 2 PRODUCTS

2.1 MATERIALS

The panel shall be 3/4 inch exterior grade plywood or 16 gauge galvanized steel sheets. Posts, rails and trim shall be wood. Paint shall be exterior type oil base paint. Nails and tacks shall be galvanized.

2.2 SIZE

The sign panel shall be a minimum of 6 1/2 feet long between posts and a minimum of 4 feet high between rails. Posts shall be of such length that the top of the project marker will be located a minimum of 8 feet above ground.

2.3 FINISH

Both sides of the sign shall be painted and lettered. Letters shall be black and background shall be white. Posts and rails shall be painted white. Letters shall be upper case block type for all lettering, except that names of major sub-contractors may be upper and lower case.

2.4 DECAL

Two decals of the "Engineer Castle", 12 inches by 8-1/2 inches in size each, will be furnished to the Contractor by the Government. One decal shall be applied to each side of the sign where indicated.

PART 3 EXECUTION

3.1 INSTALLATION

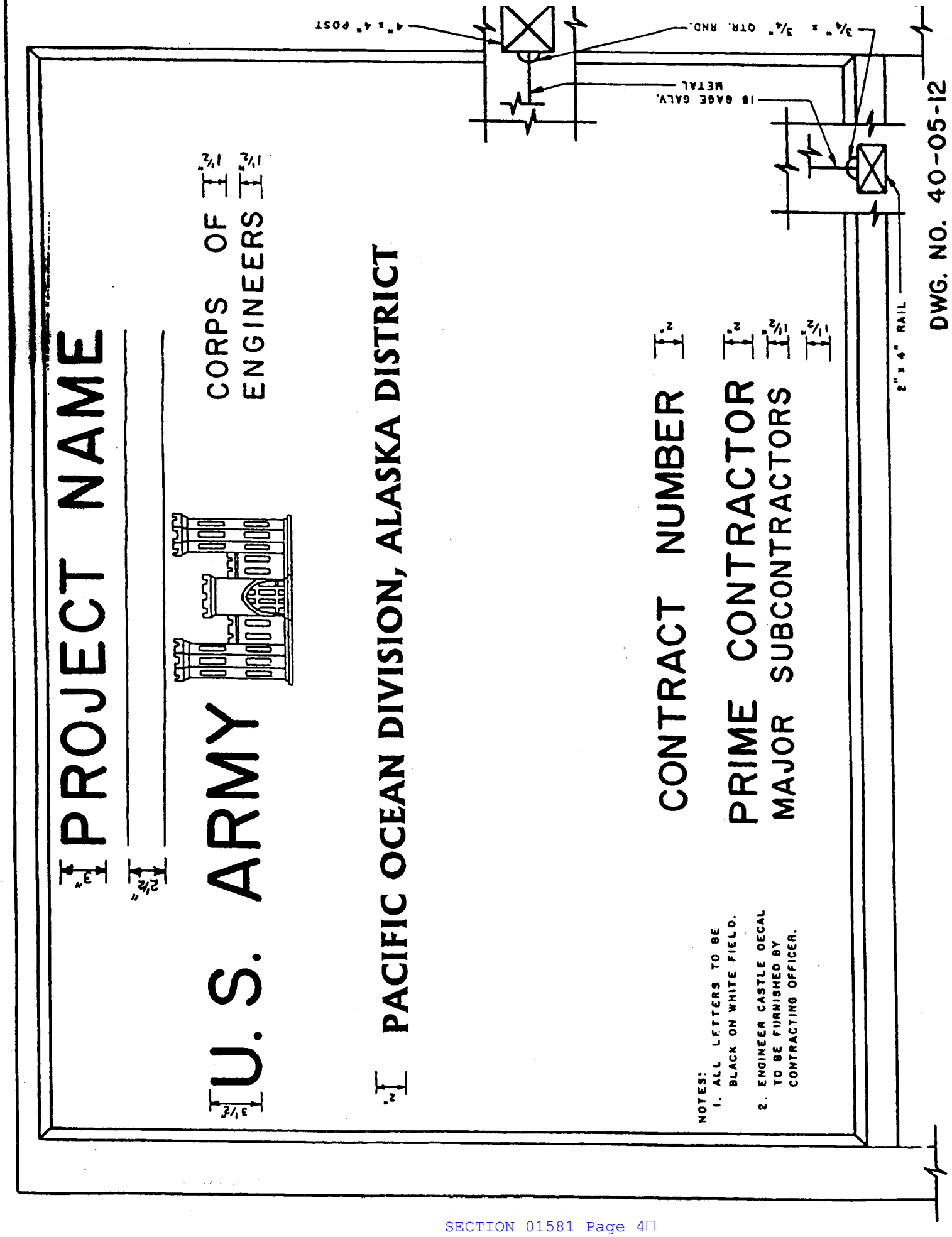
Posts shall be installed in a manner which provides a firm foundation for the marker. The marker shall be located on the project site or where directed by the Contracting Officer. The sign shall be situated to provide an unobstructed view from the access road or access area.

3.2 MAINTENANCE

The sign shall be maintained in excellent condition throughout the life of the project. Upon completion of work, the Contractor shall remove the sign.

3.3 ATTACHMENT

Drawing Number 40-05-12



--END OF SECTION--

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01721

UTILITY MAINTENANCE INFORMATION SYSTEMS

PART 1 GENERAL

1.1 SYSTEM DESCRIPTION
1.2 SUBMITTALS
1.3 AUTOCAD SCHEMATICS
1.4 AS-BUILT PHOTOS
1.4.1 As-built photos list
1.4.2 As-built photos drawings
1.4.3 Photo Coordination
1.5 MATERIALS SPREADSHEET
1.5.1 Pipes
1.5.2 Valves
1.5.3 Expansion Joints
1.5.4 Steam Traps
1.5.5 Pumps
1.5.6 Hydrants
1.5.7 Naming System
1.6 ATTACHMENTS

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

-- End of Section Table of Contents --

SECTION 01721

UTILITY MAINTENANCE INFORMATION SYSTEMS

PART 1 GENERAL

1.1 SYSTEM DESCRIPTION

Data necessary to support a utility maintenance information system shall be provided. This system will electronically provide As-Built and maintenance information to the utility engineers and maintenance crews. The contractor will provide the data specified below in electronic files on CD-ROM, which will be incorporated by the Government into this system. The information required herein is supplemental to any other requirements in this contract.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-11 Closeout Submittals

As-Built Photos; G, EN-ES.

Photo Spreadsheet; G, EN-ES.

Materials Spreadsheet; G, EN-ES.

AutoCad Schematics; G, EN-ES.

The Contractor shall provide 2-sets of CD-ROM files containing all As-Built photos, spreadsheets, and AutoCad schematics. All CD's shall be submitted in accordance with SECTION 01780 CLOSEOUT SUBMITTALS.

1.3 AUTOCAD SCHEMATICS

Contractor shall provide As-Built single-line schematics for each utility site (utilidor manhole, sewer manhole, fire hydrant manhole, building mechanical room utilidor pit, and other piping intersections/terminations) which is affected by the work under this contract. The schematics shall show the As-Built conditions and shall consist of three to six sketches as follows:

a. Upper Plan (typically showing only the upper level of piping),

b. Lower Plan (typically showing the lower level piping). Lower plan is optional only if there is a single layer of utilities (i.e. pancake configuration),

c. Middle Plan (shows any piping not shown on the upper or lower plans, typically only required for complicated sites with multiple

levels of piping),

d. Section(s) (showing the section cuts looking in the direction of each tunnel on one or two sketches depending on quantity/complexity), and

e. Photo Plan (showing the location and direction of each As-Built photo provided).

The Government will provide, via access to the Utility System Web site hyper-link (listed below), single-line schematics in AutoCAD 2000 format of the existing (pre-contract)utility sites. The Contractor shall edit these drawings to make them complete and accurate. The Contractor shall create new drawings for all new utility sites. The contractor shall maintain the drawing conventions established in the provided schematics. The Contractor shall return the completed drawings in AutoCAD 2000 DWG format. A sample of the single line schematics for a utility site is attached as Attachments 1 thru 4. Existing schematics can also be found on the Utility System Web site hyper-link listed below:

http://iss.poa.usace.army.mil/projects/ftw269
username: ftw269
password: Neely Rd.

The username and password are case sensitive, and the password includes a space and a trailing period. They will only be valid during the bidding process. The successful bidder will issued a new username and password.

These schematics use AutoCAD blocks with attributes to identify the various items on the drawings (i.e. pipes, valves, etc). The names and structure of these blocks is utilized in an automated process to associate the information provided in the materials lists (specified below) with the graphical elements on the drawing. The blocks must not be exploded or modified. There must be a one-to-one correlation between the items shown on the schematics and the materials lists provided. Any submittals not meeting these requirements will be returned for correction. A blank template with all necessary blocks can be obtained on the web site.

If additional items (i.e. pipes, valves, etc) are required to reflect the As-Built conditions, they shall be added to the drawings and named as specified below. Each item shall be named sequentially, and there shall be no duplicate names at any site. For example, if a manhole has two valves, they will be named V1 and V2. If a third valve is added it shall be named V3.

1.4 AS-BUILT PHOTOS

Electronic photos shall be taken to document the as-built conditions. Photos shall be taken only after all work is complete at a site. Photos shall be taken with a flash and a 28 mm or less wide-angle lens. If the wide-angle lens obscures the built-in flash, then an external flash assembly shall be used. Photos shall be in color, have a resolution of at least 3 megapixels, and be provided in JPEG format.

At least 15 unique electronic photos shall be taken inside each site, except mechanical room pits only require 10, and hydrant manholes - 5. These numbers are minimums and additional photos may be required to meet

the following requirements: The photos shall document each pipe entering or leaving the space, and all the appurtenances in or adjacent to that space. Photos shall be taken from different elevations, locations, and directions to get perspective from different directions on all the pipes and appurtenances at the site. In utilidor manholes, at least one photo shall be provided at least 5 feet inside all accessible tunnels, looking back at the utilidor manhole.

Two additional photos, from different locations, shall be taken of the exterior of each utility site.

Photos shall be submitted on CD-ROM with all photos for each location in a separate folder. The folders shall be given the name of the utility site. New sites shall use the naming system described later.

1.4.1 As-built photos list

Each photo shall be logged in a MS Excel photo spreadsheet, indicating the name of the utility site as described in the naming system below, the subject of the photo, the direction of the photo, (N, NE, NNE, S, etc), the date, the contractor, and the electronic filename. A single spreadsheet shall be used for all photos. An empty copy of this spreadsheet can be found on the website.

1.4.2 As-built photos drawings

The location and direction of the camera for each photo shall be shown on the electronic AutoCAD schematics using the photo arrow blocks. The attribute of the block shall contain the filename of the photo. Prefixes and extensions on the filename shall be omitted to shorten the name as much as possible, while still providing a unique filename (i.e. file name DCN00231.jpg should be 231). The attributes of the photo block will by used by the Government to automatically create a hyper-link to the photo file. An example of this can be found on the utility system website.

1.4.3 Photo Coordination

The electronic photos, list, and drawings will be returned if there is not a 100 percent match between the photos, the lists and drawings provided.

1.5 MATERIALS SPREADSHEET

The actual materials and equipment installed as part of this project will be documented for engineering and maintenance purposes. Each item, as described below, will be listed with its salient features in MS Excel spreadsheets.

A blank copy of the spreadsheet for each type of item can be found on the website. The spreadsheet has a column headings for each feature of an item. The contractor shall list each item in a single row in the appropriate spreadsheet. There shall be no rows that are blank, or contain other information. The contractor shall not modify the structure of the spreadsheet. Some columns may not be wide enough to show all information when printed (i.e. a long manufacturer's name). This is acceptable, provided that the complete information has been entered into the field.

There must be an exact one-to-one correlation between the items shown on the schematics, and the items in the materials lists. The lists and schematics will go through an automatic process, which will check for any mis-matches between the two. Drawings and lists that do not match will be returned to the contractor for correction.

If the same item (i.e. 10" Steel Pipe) is installed at multiple sites, it must be listed (with all attributes) multiple times, once for each site.

The following information shall be recorded for each type of item:

1.5.1 Pipes

a. Site - The manhole, or mechanical room per the naming system below, i.e. "I5-6-10".

b. Tag - The unique name for this item as labeled on the schematic, i.e. "W2".

c. Date Installed - i.e. "7/24/01".

d. Manufacturer's Name.

e. Manufacturer's Model Number.

f. Material.

g. Nominal diameter (inches).

h. Wall thickness excluding liner (inches).

i. Liner material.

j. Liner thickness (inches).

k. Insulation material.

l. Insulation thickness (inches).

1.5.2 Valves

a. Site - The manhole, or mechanical room per the naming system below, i.e. "I5-6-10".

b. Tag - The unique name for this item as labeled on the schematic, i.e. "V2".

c. Date Installed - i.e. "7/24/01".

d. Manufacturer's Name.

e. Manufacturer's Model Number.

f. Type (gate, ball, check, air/vacuum-relief, etc.).

g. Material.

h. Size (Nominal diameter in inches).

i. Class.

j. Stem Type.

1.5.3 Expansion Joints

a. Site - The manhole per the naming system below, i.e. "I5-6-10".

b. Tag - The unique name for this item as labeled on the schematic, i.e. "EJ2".

c. Date Installed - i.e. "7/24/01".

d. Manufacturer's Name.

e. Manufacturer's Model Number.

f. Nominal diameter (inches).

g. Stroke length (inches).

h. Connection Type (welded, flanged, etc).

i. Seal type (packed or packless).

1.5.4 Steam Traps

a. Site - The manhole, or mechanical room per the naming system below, i.e. " I5-6-10".

b. Tag - The unique name for this item as labeled on the schematic, i.e. "TR1".

c. Date Installed - i.e. "7/24/01".

d. Manufacturer's Name.

e. Manufacturer's Model Number.

f. Inlet/outlet size (inches).

1.5.5 Pumps

a. Site - The manhole, or mechanical room per the naming system below, i.e. " I5-6-10".

b. Tag - The unique name for this item as labeled on the schematic, i.e. "P2".

c. Date Installed - i.e. "7/24/01".

d. Manufacturer's Name.

e. Manufacturer's Model Number.

f. Manufacturer's Serial Number.

g. Inlet size (inches).

h. Outlet size (inches).

i. Horsepower.

j. gpm1 head1
gpm2 head2

1.5.6 Hydrants

a. Site - The manhole per the naming system below, i.e. "I5-6-10".

b. Date Installed - i.e. "7/24/01".

c. Manufacturer's Name.

d. Manufacturer's Model Number.

e. Valve opening size (inches).

f. Pumper connection size (inches).

g. Hose connection sizes (inches).

1.5.7 Naming System

Utility sites shall be named as shown on drawing C-1.

Items like pipes that are shown on the schematics, and described in the materials lists are named as follows:

a. Pipes shall be identified at each point that they enter or exit the location, and as necessary if they exist solely within the location. Each pipe shall receive a unique designation. Pipes which pass through the location unchanged, i.e. they are the same size, material, etc, can have the same designation at each end. In each location the first water line will receive the designation W1, the second, W2, etc. The order of the numbering is arbitrary. Sewer lines shall be numbered S1, S2, etc., Steam lines shall be designated H1, H2, etc., Condensate lines shall be numbered C1, C2, etc., Trace lines (connecting a Steam line to a Condensate line through a trap), shall be designated T1, T2, etc., any other miscellaneous pipes shall be designated MP1, MP2, etc.

b. Valves of all types, shall be named V1, V2, etc.

c. Expansion Joints shall be named EJ1, EJ2, etc.

d. Steam Traps shall be named TR1, TR2, etc.

e. Pumps shall be named P1, P2, etc.

f. Hydrants do not get a name, since there is only one hydrant per location.

Items shown on the drawings, but not described in the materials lists are named as follows:

a. Anchors shall be named A1, A2, etc. (note: all anchors must be

shown on the drawings, but no material list is required)

b. Cleanouts shall be named CO1, CO2, etc. (note: all cleanout must be shown on the drawings, but no material list is required)

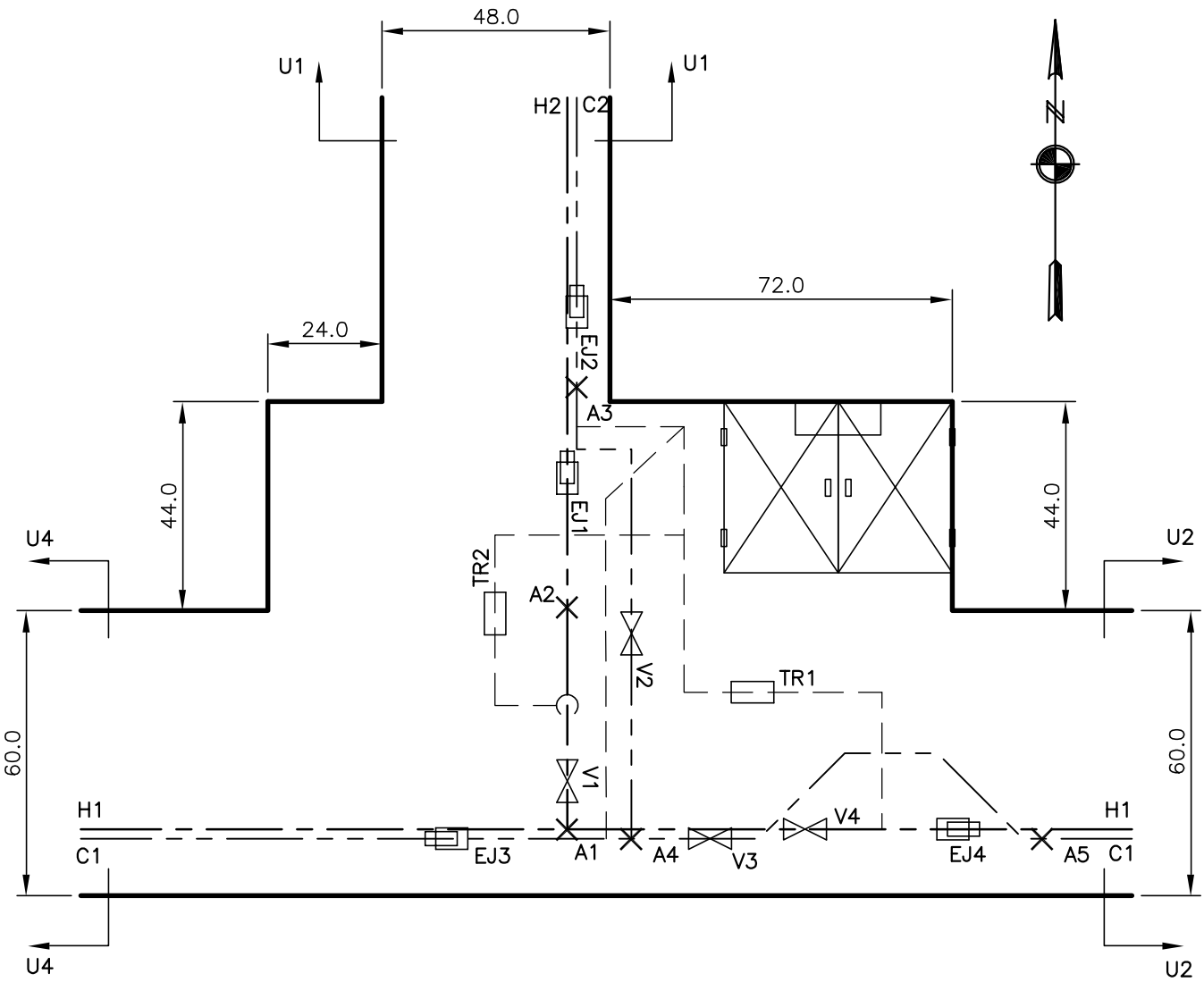
c. Tunnels, shall be named U1 - North, U2 - East, U3 - South, and U4 - West.

1.6 ATTACHMENTS

Single line schematics (4-pages)

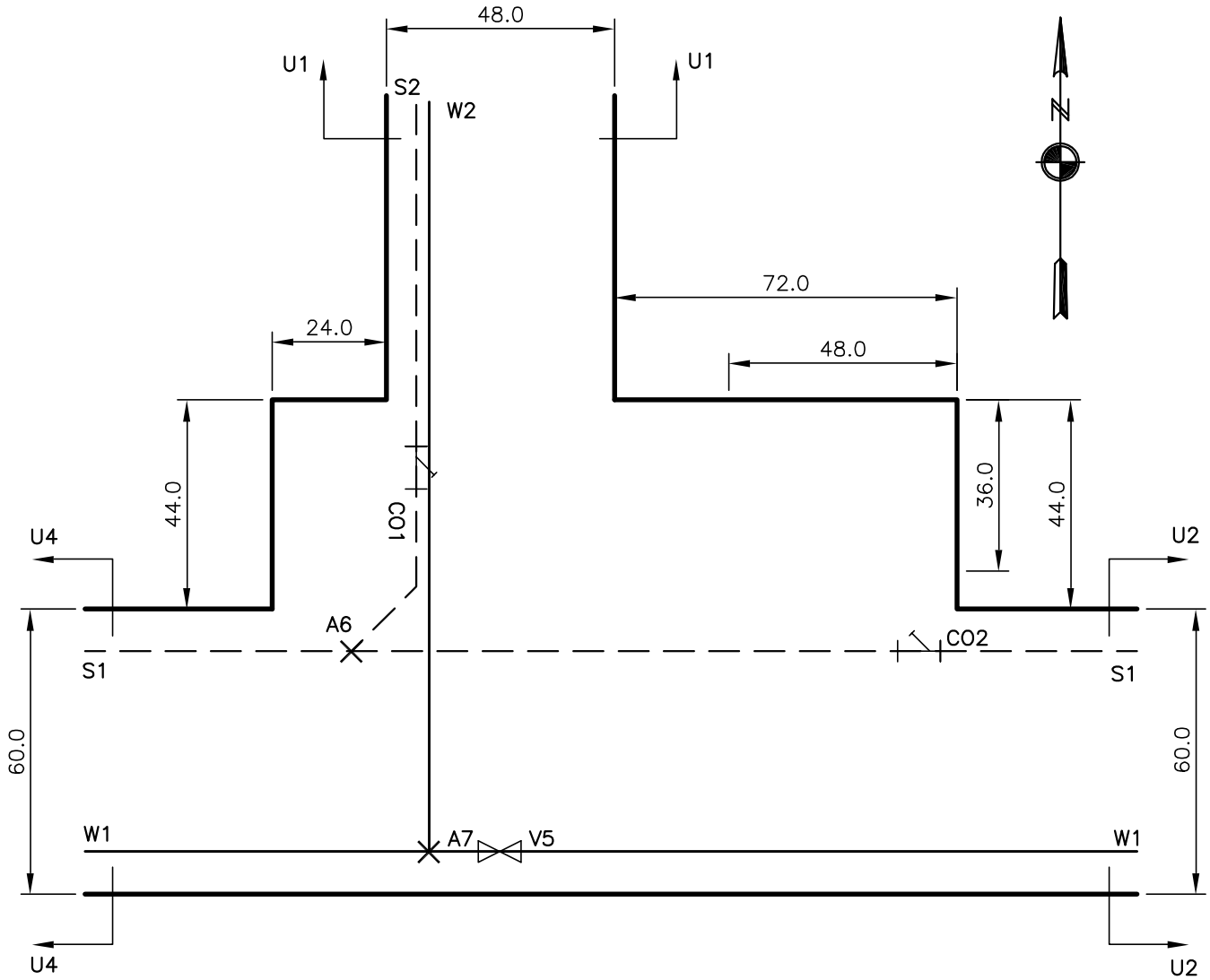
PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED



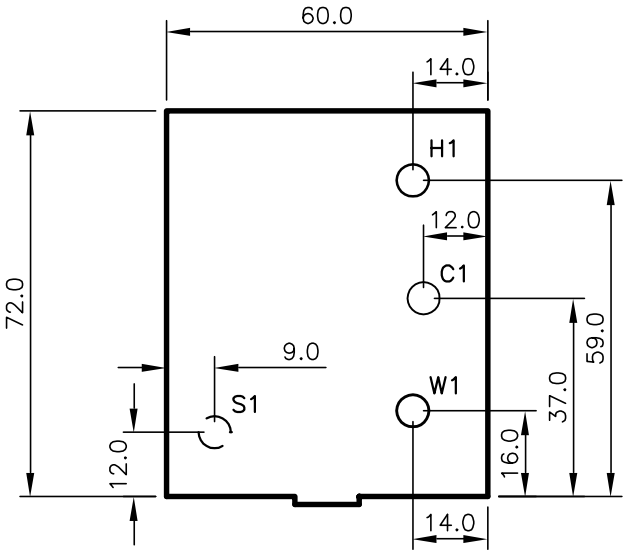
Upper Plan

Manhole: MH 602	Inspector: KTR	***Fort Wainwright Utility Inventory and Assessment***
Sheet: 1 of 4	Date: 16SEP02	Manhole Plan and Sections

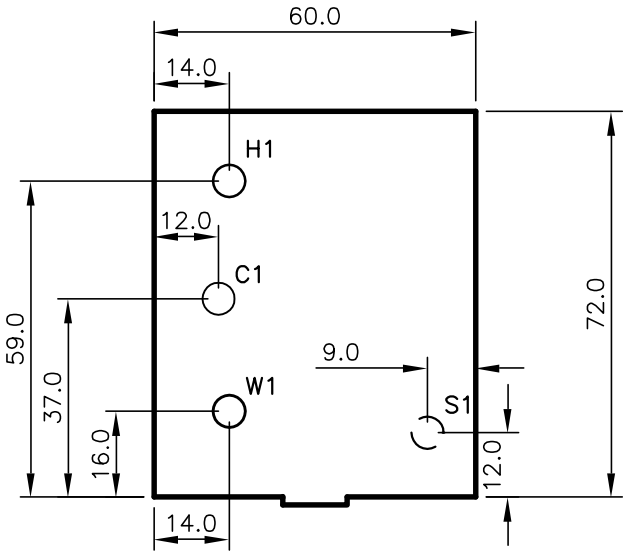


Lower Plan

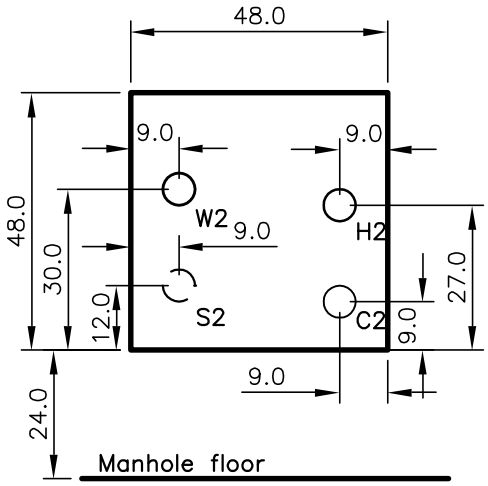
Manhole: MH 602	Inspector: KTR	***Fort Wainwright Utility Inventory and Assessment***
Sheet: 2 of 4	Date: 16SEP02	Manhole Plan and Sections



U2 (East)



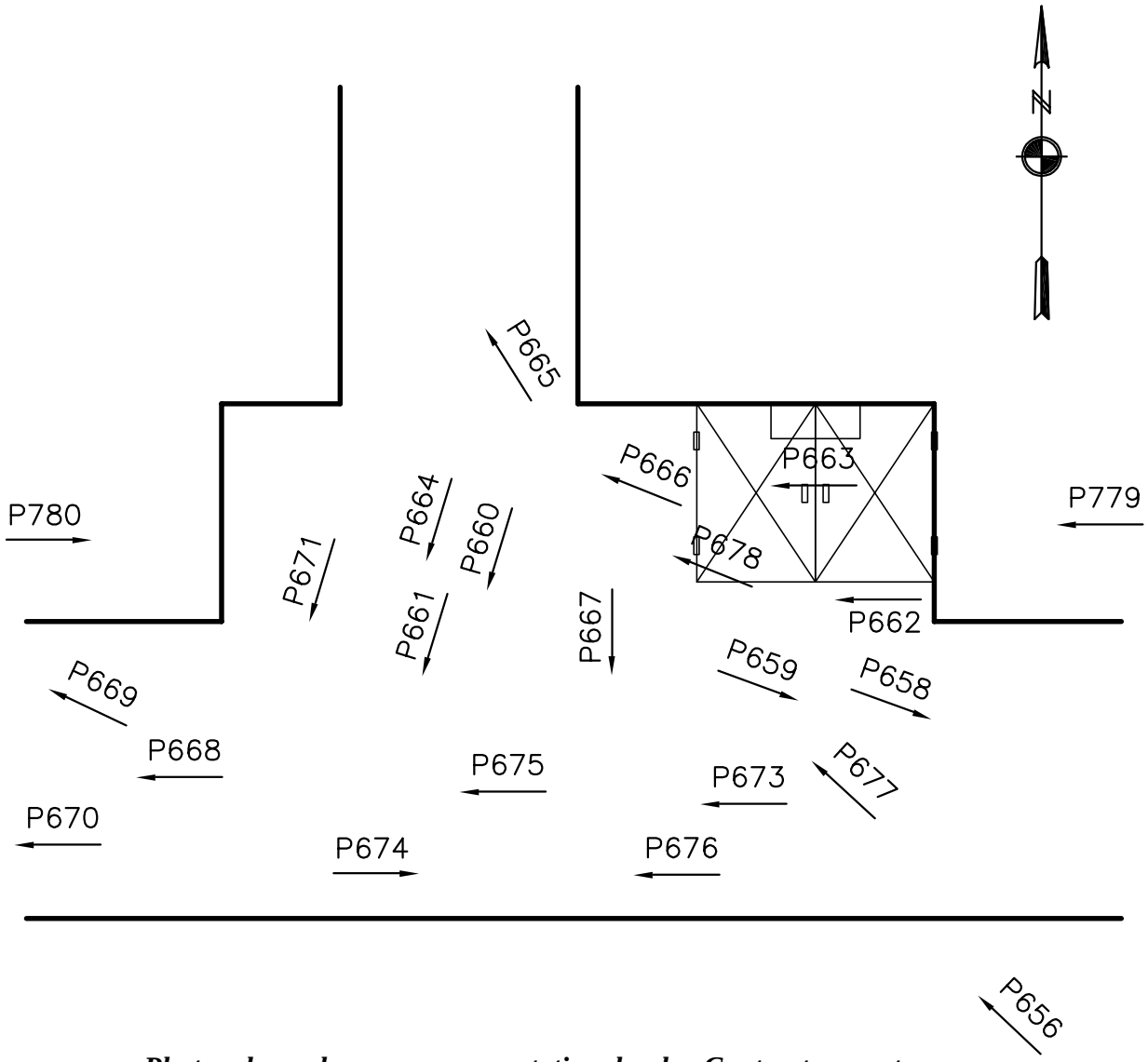
U4 (West)



U1 (North)

Sections

Manhole: MH 602	Inspector: KTR	***Fort Wainwright Utility Inventory and Assessment***
Sheet: 3 of 4	Date: 16SEP02	Manhole Plan and Sections



Photos shown here are representational only. Contractor must move, rotate, and edit these symbols to match the photos taken as required by the specifications.
Note: these symbols are blocks which must not be exploded.

Photo Plan

Manhole: MH 602	Inspector: KTR	***Fort Wainwright Utility Inventory and Assessment***
Sheet: 4 of 4	Date: 16SEP02	Manhole Plan and Sections

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01780

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SUBMITTALS
1.2 PROJECT RECORD DOCUMENTS
1.2.1 As-Built Drawings
1.2.1.1 Government Furnished Materials
1.2.1.2 Working As-Built and Final As-Built Drawings
1.2.1.3 Drawing Preparation
1.2.1.4 Computer Aided Design and Drafting (CADD) Drawings
1.2.1.5 Payment
1.2.2 As-Built Record of Equipment and Materials
1.2.3 Final Approved Shop Drawings
1.2.4 Construction Contract Specifications
1.2.5 Real Property Equipment
1.3 WARRANTY MANAGEMENT
1.3.1 Warranty Management Plan
1.3.2 Performance Bond
1.3.3 Pre-Warranty Conference
1.3.4 Contractor's Response to Construction Warranty Service Requirements
1.3.5 Warranty Tags
1.4 MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING
1.5 OPERATION AND MAINTENANCE MANUALS
1.6 FINAL CLEANING

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section Table of Contents --

SECTION 01780

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

As-Built Drawings; G, AO.

Drawings showing final as-built conditions of the project. The final CADD as-built drawings shall consist of one set of electronic CADD drawing files in the specified format, two sets of mylar drawings, 2 sets of blue-line prints of the mylars, and one set of the approved working as-built drawings.

SD-03 Product Data

As-Built Record of Equipment and Materials; G, AO.

Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.

Warranty Management Plan; G, AO.

One set of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The Contractor shall furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

Warranty Tags.

Two record copies of the warranty tags showing the layout and design.

Final Cleaning; G, AO.

Two copies of the listing of completed final clean-up items.

1.2 PROJECT RECORD DOCUMENTS

1.2.1 As-Built Drawings

This paragraph covers as-built drawings complete, as a requirement of the contract. The terms "drawings," "contract drawings," "drawing

files," "working as-built drawings" and "final as-built drawings" refer to contract drawings which are revised to be used for final as-built drawings.

1.2.1.1 Government Furnished Materials

One set of electronic CADD files in the specified software and format revised to reflect all bid amendments will be provided by the Government at the preconstruction conference for projects requiring CADD file as-built drawings.

1.2.1.2 Working As-Built and Final As-Built Drawings

The Contractor shall revise two sets of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. These working as-built marked drawings shall be kept current on a weekly basis and at least one set shall be available on the jobsite at all times. Changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. Final as-built drawings shall be prepared after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). The working as-built marked prints and final as-built drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the working and final as-built drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the as-built drawings. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. The working and final as-built drawings shall show, but shall not be limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Valves, splice boxes and similar appurtenances shall be located by dimensioning along the utility run from a reference point. The average depth below the surface of each run shall also be recorded.

b. The location and dimensions of any changes within the building structure.

c. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

d. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

e. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

f. Changes or modifications which result from the final inspection.

g. Where contract drawings or specifications present options, only the option selected for construction shall be shown on the final as-built prints.

h. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, the Contractor shall furnish a contour map of the final borrow pit/spoil area elevations.

i. Modifications (change order price shall include the Contractor's cost to change working and final as-built drawings to reflect modifications) and compliance with the following procedures.

1. Directions in the modification for posting descriptive changes shall be followed.

2. A Modification Triangle shall be placed at the location of each deletion.

3. For new details or sections which are added to a drawing, a Modification Triangle shall be placed by the detail or section title.

4. For minor changes, a Modification Triangle shall be placed by the area changed on the drawing (each location).

5. For major changes to a drawing, a Modification Triangle shall be placed by the title of the affected plan, section, or detail at each location.

6. For changes to schedules or drawings, a Modification Triangle shall be placed either by the schedule heading or by the change in the schedule.

1.2.1.3 Drawing Preparation

The as-built drawings shall be modified as may be necessary to correctly show the features of the project as it has been constructed by bringing the contract set into agreement with approved working as-built prints, and adding such additional drawings as may be necessary. These working as-built marked prints shall be neat, legible and accurate. These drawings are part of the permanent records of this project and shall be returned to the Contracting Officer after approval by the Government. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at no expense to the Government.

1.2.1.4 Computer Aided Design and Drafting (CADD) Drawings

Only personnel proficient in the preparation of CADD drawings shall be employed to modify the contract drawings or prepare additional new drawings. Additions and corrections to the contract drawings shall be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols shall be the same as the original line colors, line weights, lettering, layering

conventions, and symbols. If additional drawings are required, they shall be prepared using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final as-built drawings shall be identical to that used on the contract drawings. Additions and corrections to the contract drawings shall be accomplished using CADD files. The Contractor will be furnished "as-designed" drawings in AutoCad Release 2000 format compatible with a MS-DOS/Windows operating system. The electronic files will be supplied on compact disc, read-only memory (CD-ROM). The Contractor shall be responsible for providing all program files and hardware necessary to prepare final as-built drawings. The Contracting Officer will review final as-built drawings for accuracy and the Contractor shall make required corrections, changes, additions, and deletions.

a. CADD colors shall be the "base" colors of red, green, and blue. Color code for changes shall be as follows:

1. Deletions (red) - Deleted graphic items (lines) shall be colored red with red lettering in notes and leaders.

2. Additions (Green) - Added items shall be drawn in green with green lettering in notes and leaders.

3. Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes shall be in blue.

b. The Contract Drawing files shall be renamed in a manner related to the contract number (i.e., 98-C-10.DGN) as instructed in the Pre-Construction conference. Marked-up changes shall be made only to those renamed files. All changes shall be made on the layer/level as the original item. There shall be no deletions of existing lines; existing lines shall be over struck in red. Additions shall be in green with line weights the same as the drawing. Special notes shall be in blue on layer #63.

c. When final revisions have been completed, the cover sheet drawing shall show the wording "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in letters at least 3/16 inch high. All other contract drawings shall be marked either "AS-Built" drawing denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions. Original contract drawings shall be dated in the revision block.

d. Within 20 days for contracts $5 million and above after Government approval of all of the working as-built drawings for a phase of work, the Contractor shall prepare the final CADD as-built drawings for that phase of work and submit two sets of blue-lined prints of these drawings for Government review and approval. The Government will promptly return one set of prints annotated with any necessary corrections. Within 10 days for contracts $5 million and above the Contractor shall revise the CADD files accordingly at no additional cost and submit one set of final prints for the completed phase of work to the Government. Within 20 days for contracts $5 million and above of substantial completion of all phases of work, the Contractor shall submit the final as-built drawing package for the entire project. The submittal shall consist of one set of electronic files on compact disc, read only memory (CD-ROM), two

sets of mylars, two sets of blue-line prints and one set of the approved working as-built drawings. They shall be complete in all details and identical in form and function to the contract drawing files supplied by the Government. Any transactions or adjustments necessary to accomplish this is the responsibility of the Contractor. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CADD system. Paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final as-built drawing files and marked prints as specified shall be cause for withholding any payment due the Contractor under this contract. Approval and acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.

1.2.1.5 Payment

No separate payment will be made for as-built drawings required under this contract, and all costs accrued in connection with such drawings shall be considered a subsidiary obligation of the Contractor.

1.2.2 As-Built Record of Equipment and Materials

The Contractor shall furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Two sets of final record of equipment and materials shall be submitted 10 days after final inspection. The designations shall be keyed to the related area depicted on the contract drawings. The record shall list the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA

Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

1.2.3 Final Approved Shop Drawings

The Contractor shall furnish final approved project shop drawings 30 days after transfer of the completed facility.

1.2.4 Construction Contract Specifications

The Contractor shall furnish final as-built construction contract specifications, including modifications thereto, 30 days after transfer of the completed facility.

1.2.5 Real Property Equipment

The Contractor shall furnish a list of installed equipment furnished under this contract. The list shall include all information usually listed on manufacturer's name plate. The "EQUIPMENT-IN-PLACE LIST" shall include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), model number, serial number, capacity, name and address of manufacturer, name and address of equipment supplier, condition, spare parts list,

manufacturer's catalog, and warranty. A draft list shall be furnished at time of transfer. The final list shall be furnished 30 days after transfer of the completed facility.

1.3 WARRANTY MANAGEMENT

1.3.1 Warranty Management Plan

The Contractor shall develop a warranty management plan which shall contain information relevant to the clause Warranty of Construction in Section 01015. At least 30 days before the planned pre-warranty conference, the Contractor shall submit the warranty management plan for Government approval. The warranty management plan shall include all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below shall include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase shall be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Approved information shall be assembled in a binder and shall be turned over to the Government upon acceptance of the work. The construction warranty period shall begin on the date of project acceptance and shall continue for the full product warranty period. A joint 4 month and 9 month warranty inspection shall be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Information contained in the warranty management plan shall include, but shall not be limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. Listing and status of delivery of all Certificates of Warranty for extended warranty items, pumps, motors, and for all commissioned systems such as fire protection and alarm systems, lightning protection systems, etc.

c. A list for each warranted equipment, item, feature of construction or system indicating:

1. Name of item.

2. Model and serial numbers.

3. Location where installed.

4. Name and phone numbers of manufacturers or suppliers.

5. Names, addresses and telephone numbers of sources of spare parts.

6. Warranties and terms of warranty. This shall include one-year overall warranty of construction. Items which have extended warranties shall be indicated with separate warranty expiration dates.

7. Cross-reference to warranty certificates as applicable.

8. Starting point and duration of warranty period.

9. Summary of maintenance procedures required to continue the warranty in force.

10. Cross-reference to specific pertinent Operation and Maintenance manuals.

11. Organization, names and phone numbers of persons to call for warranty service.

12. Typical response time and repair time expected for various warranted equipment.

d. The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

e. Procedure and status of tagging of all equipment covered by extended warranties.

f. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.3.2 Performance Bond

The Contractor's Performance Bond shall remain effective throughout the construction warranty period.

a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, the Contractor shall respond in a timely manner. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.3.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction

warranty shall be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor shall furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, shall be continuously available, and shall be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.3.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, the Contractor shall respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. The Contractor shall submit a report on any warranty item that has been repaired during the warranty period. The report shall include the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframes specified, the Government will perform the work and backcharge the construction warranty payment item established.

a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

d. The "Construction Warranty Service Priority List" is as follows:

Code 1-Electrical
1. Power failure (entire area or any building operational after 1600 hours).
2. Security lights
3. Smoke detectors

Code 2-Electrical
1. Power failure (no power to a room or part of building).
2. Receptacle and lights (in a room or part of building).

Code 3-Electrical
Street lights.

Code 1-Heat
1. Area power failure affecting heat.
2. Heater in unit not working.

1.3.5 Warranty Tags

At the time of installation, each warranted item shall be tagged with a durable, oil and water resistant tag approved by the Contracting

Officer. Each tag shall be attached with a copper wire and shall be sprayed with a silicone waterproof coating. The date of acceptance and the QC signature shall remain blank until project is accepted for beneficial occupancy. The tag shall show the following information.

a. Type of product/material_____.

b. Model number_____.

c. Serial number_____.

d. Contract number_____.

e. Warranty period_____from_____to_____.

f. Inspector's signature_____.

g. Construction Contractor_____.

Address_____.

Telephone number_____.

h. Warranty contact_____.

Address_____.

Telephone number_____.

i. Warranty response time priority code_____.

j. WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.

1.4 MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING

Prior to final inspection and transfer of the completed facility; all reports, statements, certificates, and completed checklists for testing, adjusting, balancing, and commissioning of mechanical systems shall be submitted to and approved by the Contracting Officer as specified in applicable technical specification sections.

1.5 OPERATION AND MAINTENANCE MANUALS

Operation manuals and maintenance manuals shall be submitted as specified. Operation manuals and maintenance manuals provided in a common volume shall be clearly differentiated and shall be separately indexed.

1.6 FINAL CLEANING

The premises shall be left broom clean. Stains, foreign substances, and temporary labels shall be removed from surfaces. Equipment and fixtures shall be cleaned to a sanitary condition. Filters of operating equipment shall be replaced. Paved areas shall be swept and landscaped areas shall be raked clean. The site shall have waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, and construction facilities removed. A list of completed clean-up items shall be submitted on the

day of final inspection.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02112

FIELD SCREEN TESTING OF SOILS FOR POL CONTAMINATION

PART 1 GENERAL

1.1 APPLICABLE PUBLICATIONS
1.2 DESCRIPTION OF WORK
1.2.1 Worker Protection
1.2.2 Available Data
1.2.3 Inspection
1.2.4 Compliance
1.3 SUBMITTALS

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 CONTAMINATED SOIL IDENTIFICATION
3.1.1 Leaks, Spills, and Releases
3.1.2 Indications of Soil Contamination
3.2 SAMPLING AND ANALYSIS PLAN (SAP)
3.2.1 Sampling and Analysis Plan
3.2.2 Control
3.2.3 Field Screening Tests
3.2.4 Additional Sampling
3.3 PERSONNEL
3.3.1 Consultant
3.4 EXCAVATION
3.5 BACKFILL
3.6 FIELD REPORT
3.6.1 Field Report Contents
3.6.2 Chemical Data Final Report
3.6.2.1 CHEMICAL DATA FINAL REPORT
3.6.3 Field Report Schedule
3.7 SAFETY AND HEALTH
3.7.1 Safety and Health Program (SHP)
3.7.2 Qualifications
3.7.3 Site Specific Safety and Health Plan (SSSHP)
3.7.4 Correspondence

-- End of Section Table of Contents --

SECTION 02112

FIELD SCREEN TESTING OF SOILS FOR POL CONTAMINATION

PART 1 GENERAL

1.1 APPLICABLE PUBLICATIONS

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 2488	(2003) Description and Identification of Soils (Visual-Manual Procedure)

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction

STATE OF ALASKA ADMINISTRATIVE CODE (AAC)

8 AAC 61	(2003) Occupational Safety and Health Standards
18 AAC 75	(2003) Oil and Hazardous Substances Pollution Control

STATE OF ALASKA STATUTES (AS)

Title 18	Health, Safety and Housing

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 200-1-1	(1999) Validation of Analytical Chemistry Laboratories
EM 200-1-3	(1994) Requirements for the Preparation of Sampling and Analysis Plans Ch 1
EM 385-1-1	(2003) Safety and Health Requirements Manual
ER 385-1-92	(Dec 1991) Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities.

1.2 DESCRIPTION OF WORK

The Contractor shall field screen soils at the project site to determine

if petroleum, oil, and lubricants (POL) contamination is present. If encountered, contaminated soil shall be segregated, stockpiled, characterized, treated, and returned to Ft. Wainwright in compliance with all applicable regulations.

1.2.1 Worker Protection

The Contractor shall provide personal protective equipment and other tools required for worker protection as appropriate for work conditions and as required by paragraph, SAFETY AND HEALTH. The Contractor shall provide 2 sets of personal protective equipment, as required, for the Contracting Officer's Representative.

1.2.2 Available Data

Test borings have been taken at the site of the new utilidor section. No contamination was encountered during the investigation. See the drawings for soil logs and plotted locations of test borings. Though no contamination was encountered during the investigation, it should be assumed that approximately 10 cubic yards of POL-contaminated soil will be encountered during excavation activities.

1.2.3 Inspection

Federal, State or local agencies may require their representative(s) to be present to inspect operations. The Contractor shall comply with all such inspection requirements.

1.2.4 Compliance

Work shall meet or exceed the minimum requirements established by the State of Alaska in applicable statutes and administrative codes. These documents are under constant revision. The Contractor shall be responsible for compliance with the most recent revisions to the regulations throughout the duration of work on the project. The Contractor shall also be responsible for compliance with all applicable Federal and local regulations. Any instances where compliance would exceed the scope of work or specific requirements of the contract, and any conflicts between various regulations or between any regulation and the contract specifications, shall be brought to the immediate attention of the Contracting Officer for resolution.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Sampling and Analysis Plan; G.

The site specific Sampling and Analysis Plan (SAP) shall include the Field Sampling Plan (FSP) and the Quality Assurance Program Plan (QAPP). See paragraph, SAMPLING AND ANALYSIS PLAN (SAP).

a. Seven (7) copies of the SAP shall be submitted for approval at

least 30 days prior to start of work at the site. The Contractor shall make corrections indicated by comments and identify any items considered to be in conflict with, or a change to, the contract. Excavation shall not begin prior to approval of the SAP by the Contracting Officer.

b. The Contractor shall correct and resubmit items which are unacceptable for detailed review. The 30 day period specified above will not begin until all corrected items are received by the Contracting Officer.

Safety and Health Program (SHP); G.

Include the Site Specific Safety and Health Plan (SSSHP), and qualifications and training of the site supervisors and employees. See paragraph, SAFETY AND HEALTH.

Correspondence;

SD-07 Certificates

Qualifications; G.

Resume' of consultant. See Paragraph, PERSONNEL.

SD-09 Manufacturer's Field Reports

Field Report; G.

Draft and Final Field Report. See paragraph, FIELD REPORT.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 CONTAMINATED SOIL IDENTIFICATION

Based on current and historical use of the site, limited quantities of localized POL-contaminated soils within the project site may be encountered. Potential contaminants are likely to include benzene, toluene, ethylbenzene, xylenes (BTEX), gasoline range organics (GRO), diesel range organics (DRO), residual range organics (RRO) and lead. Soil is considered contaminated when respective contaminant concentrations are above the Cleanup Levels provided for the under 40 inch zone in Tables B1 and B2 of 18 AAC 75. It should be assumed that approximately 10 cubic yards of POL-contaminated soil will be excavated and will require segregation, stockpiling, characterization, treatment and trasportion back to Ft. Wainwright in accordance with State of Alaska regulations. It should be assumed that three (3) samples will be collected from three (3) separate locations (total of nine (9) samples) and analyzed for GRO/BTEX by method AK101, DRO by method AK102, RRO by method AK103, and lead by EPA method 7421. For these samples the contractor must use a USACE validated laboratory and an ADEC approved sampler. Contaminated soil shall be transported and stockpiles shall be constructed in accordance with ADEC requirements. Stockpiles shall be constructed at locations directed by the Contracting officer. Stockpile locations will be within one mile of the excavation. Visual inspection and field screening shall be used as described in the FSP to segregate clean and contaminated soil. Asphalt shall not be screened or

stockpiled but reused or disposed of. The Contractor shall perform a general site inspection as outlined in paragraph, FIELD REPORT. Analytical deliverables shall be provided as stated in paragraph 3.6.2, Chemical Data Final Report.

3.1.1 Leaks, Spills, and Releases

Whenever the Contractor suspects or has knowledge of a leak, spill, or release of oil, hazardous substance, or regulated substance NOT PREVIOUSLY IDENTIFIED IN THE CONTRACT DOCUMENTS, (s)he shall immediately prepare an ADEC Oil and Hazardous Materials Incident Report Form in accordance with ADEC regulations. The Contractor shall hand-deliver (or send by facsimile mail) a copy of the form to the Contracting Officer. The Installation Environmental Office will be responsible for providing notification to ADEC.

3.1.2 Indications of Soil Contamination

Should the Contractor encounter visible stains, smell of fuels or volatiles, or readings significantly above background in any field screening test, the Contracting Officer shall be notified immediately, by phone and in writing. The Contractor shall reevaluate the SHP as appropriate and await direction from the Contracting Officer before proceeding with excavation.

3.2 SAMPLING AND ANALYSIS PLAN (SAP)

The plan shall include an executive summary. The SAP shall reflect the degree of complexity of the project. The Contractor shall formulate the plan to provide field screening for POL contamination in all soils to be excavated. The Contractor shall prepare and submit the SAP to the Contracting Officer for review and approval.

3.2.1 Sampling and Analysis Plan

The SAP shall be composed of a Field Sampling Plan (FSP) and a Quality Assurance Program Plan (QAPP). The plans shall be site specific and include method to be used for field screening and frequency of sampling.

3.2.2 Control

The Contractor shall exercise a high degree of control over field screening in conjunction with construction in order to adequately screen for POL contaminated soil.

3.2.3 Field Screening Tests

The Contractor's consultant shall use a Hydrocarbon Vapor (HV) test or other appropriate field test to qualitatively check for the presence or absence of soil contamination where visible stains are not apparent. Field screening shall be utilized according to prudent, professional judgement. The Contractor shall include in the SAP a description of the type of instruments selected, limits, action levels, procedures for testing, and the consultant's training to use the instruments and interpret the data. The Contractor shall prepare a table of field screening results to be updated as work proceeds. A final copy, including an explanatory narrative, shall be part of the Field Report.

3.2.4 Additional Sampling

If unsuitable (contaminated) soil conditions, in the opinion of the Contracting Officer, are encountered within the site boundaries, (s)he may direct sampling and testing beyond that outlined in the SAP be performed. The Contractor shall perform such additional sampling and testing only when so directed in writing. Sampling and testing shall include quality control and Government quality assurance sampling, as required. An equitable modification of the Contract will be made for any directed additional sampling and testing.

3.3 PERSONNEL

3.3.1 Consultant

The Contractor shall provide an experienced and qualified consultant. The consultant shall be on site during all excavation operations involving soil to be checked for contamination. The consultant's qualifications shall be submitted to the Contracting Officer for approval. Acceptability will be determined on the basis of education, training, experience, and past performance. The Consultant shall be experienced in all phases of the required work. The Consultant shall perform all field screening. The Consultant shall review the SAP, review tests results, and provide recommendations for the Contractor's testing program. The Consultant shall have a minimum of 2-years experience in the development and preparation of SAP's. The Consultant shall have a minimum of a 4-year college degree in Chemistry, Environmental Science, Engineering, Geology, Hydrology, or a related field; experience in and knowledge of EPA methods for collecting environmental and hazardous waste samples; and experience in operation of field screening equipment.

3.4 EXCAVATION

The Contractor shall conduct field screen testing prior to excavation to determine the approximate boundaries of any soil contamination and throughout the duration of excavation activities to identify any contaminated soils.

3.5 BACKFILL

The Contractor shall obtain approval for backfilling from the Contracting Officer in writing prior to placement of any backfill. Backfill shall be placed in accordance with other sections of these specifications, as appropriate. Excavated materials conforming to specification requirements for materials to be used for fills, backfilling, grading or topsoiling, may be utilized provided there are no indications of contamination as defined herein.

3.6 FIELD REPORT

3.6.1 Field Report Contents

The Contractor shall prepare and submit a draft and final Field Report to the Contracting Officer. All copies, except one final Field Report, shall be bound, including all photographs/slides. The Contractor shall make an assessment of the site based on the field work and analysis required by this contract. The Field Report shall contain a Chemical Data Final Report as discussed in paragraph Chemical Data Final Report. As a minimum, each Field Report shall include the following:

a. the owner's name and address (_____);

b. the operator's name and address, if different form the owner (_____);

c. the name and business address of each person who supervised the site assessment or site inspection;

d. a scaled site sketch that approximately shows;

1. the location and configuration of any tanks and piping (if applicable);

2. the locations and depths of field screening tests;

3. the proximity to buildings and residences;

4. any release sites (if applicable);

5. any free product sites (if applicable);

6. the facility and property boundaries;

7. a bar scale and north arrow; and

8. any other pertinent information;

e. a photographic history and description of the contract work to include pre- and post-construction photographs. Each print shall show the following information in typewritten format.

* Location	Contract No.
* Contractor/Photographer	Date/Time:
* Photograph No.	
* Description	
* Direction of View	

f. local climatological conditions during the on-site work;

g. field screening information to include:

1. date, time, and location of tests, including a plan and section view of the excavation;

2. name of person performing;

3. unusual/unexpected problems;

4. photographs;

5. Summary of test results.

h. General Site Inspection: The inspection of the site(s) shall be documented in the Field Report. The inspection shall include:

1. checking for obvious leaks and spills;

2. checking for any obvious soil contamination caused by a

release or leakage;

3. classifying the soil strata according to ASTM D 2488 from visual observations of the site and any required excavation. (Note: sieve analyses ARE NOT required; excavation is not required SOLELY for soil strata classification);

4. recording local climatological conditions during inspection.

i. Field Notes: The Contractor shall maintain field notes in a bound book. Field notes shall be written in ink. Erasures will not be allowed. The Contractor shall document all field activities and any visibly contaminated soil. The Contractor shall include a copy of the field notes as part of the draft Field Report. The original field notes shall be submitted as part of the final Field Report.

3.6.2 Chemical Data Final Report

3.6.2.1 CHEMICAL DATA FINAL REPORT

The CDFR shall be produced including a summary of quality control practices employed and all chemical parameter measurement activities after project completion. As a minimum, the CDFR shall contain the following:

a. Summary of project scope and description.

b. Summary of any deviations from the design chemical parameter measurement specifications.

c. Summary of chemical parameter measurements performed as contingent measurements.

d. Summary discussion of resulting data including achieving data reporting requirements.

e. Summary of achieving project specific DQO.

f. Presentation and evaluation of the data to include an overall assessment on the quality of the data for each method and matrix.

g. Internal QC data generated during the project, including tabular summaries correlating sample identifiers with all blank, matrix spikes, surrogates, duplicates, laboratory control samples, and batch identifiers.

h. A list of the affected sample results for each analyte (indexed by method and matrix) including the appropriate data qualifier flag (J, B, R, etc.), where sample results are negatively impacted by adverse quality control criteria.

i. Summary of field and laboratory oversight activities, providing a discussion of the reliability of the data, QC problems encountered, and a summary of the evaluation of data quality for each analysis and matrix as indicated by the laboratory QC data and any other relevant findings.

j. Conclusions and recommendations.

k. Appendices containing: (1) Chemistry data package, and (2) Electronic Deliverables. The Chemistry data package shall be in accordance with EM 200-1-3, Appendix I: Definitive Data Package. The Electronic Deliverables will be in accordance with the following: The laboratory shall have demonstrated capability to produce electronic data deliverables using EDF 1.2a. All laboratory data shall be furnished in accordance with Electronic Deliverable Format (EDF) version 1.2a. All chemical laboratory data shall be delivered in the EDF format along with a printed error-free summary log generated with the EDCC (Electronic Data Consistency Checker). Two final EDF copies shall be delivered to CEPOA as part of the chemical data package. The government will only accept paper copy reports and electronic deliverables with no discrepancies between the two. If any discrepancies are found, no payment will be made to the contractor for analyses in the affected data package until corrected deliverables are received. Late penalties will be assessed until corrections are received. The EDF shall be delivered on 3.5 inch diskettes or CD-ROM. Diskettes shall be labeled with the project name, identification number, report number, data, name of the laboratory, and a point of contact.

3.6.3 Field Report Schedule

The Contractor shall submit the draft field report to the Contracting Officer within 21 calendar days of completion of excavation. The Contracting Officer will provide comments on the draft report to the Contractor within 30 calendar days after the draft report has been submitted. The Contractor shall incorporate all Government comments in the final report. The Contractor shall submit the final report to the Contracting Officer within 14 calendar days or receipt of comments.

3.7 SAFETY AND HEALTH

3.7.1 Safety and Health Program (SHP)

The Contractor shall have a developed and maintained written Safety and Health Program in compliance with the requirements of OSHA standard 29 CFR 1910.120(b)(1) through (b)(4). Relevant portions of 29 CFR 1910 Subpart Z - Toxic and Hazardous Substances; 29 CFR 1926 Subparts 21(b), 651(g), and 800(h) & (i); 8 AAC 61 Subchapter 10; 18 AAC 75; COE ER 385-1-92; and
COE EM 385-1-1, SECTIONS 01.B through 01.E, 05.E, 06, 28, and Appendices K and L shall be addressed. The SHP shall incorporate an Accident Prevention Plan and description of work phase safety plans as required by Section 01.A of COE EM 385-1-1. The level of detail provided in the SHP shall be tailored to the type of work, complexity of operations to be accomplished, and the hazards anticipated. The SHP shall be reviewed and signed by a Certified Industrial Hygienist or Certified Safety Professional. All subcontractors shall comply with the prime Contractor's SHP unless the subcontractor has submitted a separate SHP through the prime Contractor. The SHP shall be updated when required. The SHP shall be submitted in its entirety to the Contracting Officer prior to any work on site.

3.7.2 Qualifications

The SHP shall provide evidence of related safety and health training received by the supervisors and employees. Supervisors' and employees'

qualifications shall be submitted to the Contracting Officer for approval. Acceptability will be determined on the basis of education, training, experience and past performance. Additionally, at least one person certified in first aid and CPR by the Red Cross, or equivalent agency, shall be present on site during all field operations.

3.7.3 Site Specific Safety and Health Plan (SSSHP)

The SSSHP part of the SHP shall be prominently displayed at the job site. Alaska Statutes Title 18.60.066 - .068 shall also be displayed at the same location.

3.7.4 Correspondence

Copies of all correspondence with other Government agencies shall be furnished to the Contracting Officer immediately upon issue or receipt. All Contractor correspondence with ADEC shall be through the Contracting Officer. Cover letters shall be appropriately addressed with "TO:" and "THROUGH:" headings.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02220

DEMOLITION

PART 1 GENERAL

1.1 REFERENCES
1.2 GENERAL REQUIREMENTS
1.3 SUBMITTALS
1.4 SUBMITTALS SUPPLEMENT
1.4.1 Work Plan
1.5 DUST CONTROL
1.6 PROTECTION
1.6.1 Protection of Personnel
1.6.2 Protection of Structures
1.6.3 Protection of Existing Property
1.6.4 Protection From the Weather
1.6.5 Protection of Trees
1.6.6 Environmental Protection
1.7 BURNING
1.8 USE OF EXPLOSIVES

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 UTILITIES
3.2 DISPOSITION OF MATERIAL
3.2.1 Salvageable Items and Material
3.2.1.1 Material Salvaged for the Contractor
3.2.1.2 Historical Items
3.2.2 Unsalvageable Material
3.3 CLEAN UP
3.4 PAVEMENTS

-- End of Section Table of Contents --

SECTION 02220

DEMOLITION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2003) Safety and Health Requirements Manual

1.2 GENERAL REQUIREMENTS

The work includes demolition, salvage of identified items and materials, and removal of resulting rubbish and debris. Rubbish and debris shall be removed from Government property daily, unless otherwise directed, to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Contracting Officer. In the interest of occupational safety and health, the work shall be performed in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections. In the interest of conservation, salvage shall be pursued to the maximum extent possible; salvaged items and materials shall be disposed of as specified.

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

Work Plan; G, RE

1.4 SUBMITTALS SUPPLEMENT

See paragraphs below for further descriptions (when available) of submittals required by paragraph SUBMITTALS.

1.4.1 Work Plan

The procedures proposed for the accomplishment of the work. The procedures shall provide for safe conduct of the work, including procedures and methods to provide necessary supports, lateral bracing and shoring when required, careful removal and disposition of materials specified to be salvaged, protection of property which is to remain undisturbed, coordination with other work in progress, and timely disconnection of utility services. Work plan shall include proposed

salvage procedures, including careful excavation, disassembly, removal, transport and storage. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations in accordance with EM 385-1-1.

1.5 DUST CONTROL

The amount of dust resulting from demolition shall be controlled to prevent the spread of dust to occupied portions of the construction site and to avoid creation of a nuisance in the surrounding area. Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as ice, flooding and pollution.

1.6 PROTECTION

1.6.1 Protection of Personnel

During the demolition work the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

1.6.2 Protection of Structures

Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, shall remain standing without additional bracing, shoring, of lateral support until demolished, unless directed otherwise by the Contracting Officer. The Contractor shall ensure that no elements determined to be unstable are left unsupported and shall be responsible for placing and securing bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

1.6.3 Protection of Existing Property

Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The Contractor shall take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government; any damaged items shall be repaired or replaced as approved by the Contracting Officer. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

1.6.4 Protection From the Weather

The interior of buildings to remain; salvageable materials and equipment shall be protected from the weather at all times.

1.6.5 Protection of Trees

Any tree designated to remain that is damaged during the work under this contract shall be replaced in kind or as approved by the Contracting Officer.

1.6.6 Environmental Protection

The work shall comply with the requirements of SECTION 01411 ENVIRONMENTAL PROTECTION.

1.7 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted.

1.8 USE OF EXPLOSIVES

Use of explosives will not be permitted.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 UTILITIES

Existing utilities shall be removed as indicated. When utility lines are encountered that are not indicated on the drawings, the Contracting Officer shall be notified prior to further work in the area.

3.2 DISPOSITION OF MATERIAL

Title to material and equipment to be demolished, except Government salvage and historical items, is vested in the Contractor upon receipt of notice to proceed. The Government will not be responsible for the condition, loss or damage to such property after notice to proceed.

3.2.1 Salvageable Items and Material

Remove materials and equipment that are indicated on the drawings and listed below to be removed by the Contractor and that are to remain the property of the Government.

Contractor shall salvage items and material to the maximum extent possible.

Salvaged items to remain the property of the Government shall be removed in a manner to prevent damage, pipe ends covered and packed or stacked to protect the items from damage while in storage or during shipment. Items damaged during removal or storage shall be repaired or replaced to match existing items. The following items reserved as property of the Government shall be stored at the Contractor's staging area and the Government notified when all salvaged material is ready:

Direct buried 6" condensate line between Manhole H4-8-3 and Manhole H4-8-4.
Direct buried 6" condensate line between Manhole H4-9-1 and Manhole H4-9-2.

3.2.1.1 Material Salvaged for the Contractor

Material salvaged for the Contractor shall be stored as approved by the Contracting Officer and shall be removed from Government property before completion of the contract. Material salvaged for the Contractor shall not be sold on the site.

3.2.1.2 Historical Items

Historical items shall be removed in a manner to prevent damage. The following historical items shall be delivered to the Government for disposition.

3.2.2 Unsalvageable Material

Concrete, masonry, and other noncombustible material, except concrete permitted to remain in place, shall be disposed of in the disposal area located as shown on the drawings. The fill in the disposal area shall be uniformly graded to drain. Combustible material shall be disposed of in the sanitary fill area located as shown on the drawings.

3.3 CLEAN UP

Debris and rubbish shall be removed from basement and similar excavations. Debris shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

3.4 PAVEMENTS

Existing pavements designated for removal shall be saw cut and removed in accordance with the details shown on the drawings.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02300

EARTHWORK

PART 1 GENERAL

1.1 REFERENCES
1.2 DEFINITIONS
1.2.1 Nonfrost Susceptible Soils
1.2.2 Satisfactory Materials
1.2.3 Unsatisfactory Materials
1.2.4 Classified Fill
1.2.5 Unclassified Fill and Backfill
1.2.6 Fill
1.2.7 Backfill
1.2.8 Cohesionless and Cohesive Materials
1.2.9 Degree of Compaction
1.2.10 Topsoil
1.3 SUBMITTALS
1.4 SOURCE OF MATERIALS
1.5 MAXIMUM DENSITY DETERMINATIONS
1.5.1 Definition
1.5.2 Density Tests
1.6 SUBSURFACE DATA
1.7 BLASTING
1.8 UTILIZATION OF EXCAVATED MATERIALS

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 CONSERVING OF TOPSOIL
3.2 CLEARING AND GRUBBING
3.2.1 Disposal of Cleared and Grubbed Material
3.3 EXCAVATION
3.3.1 General
3.3.2 Groundwater
3.3.3 Contaminated Soil
3.3.4 Field Modifications
3.3.5 Drainage
3.3.6 Shoring
3.3.7 Disposal of Excavated Material
3.3.8 Protection of Utilities
3.4 FILL AND BACKFILL
3.4.1 General
3.4.2 Backfilling of Trenches
3.4.3 Fill and Backfill Against Walls of Structures
3.4.4 Fill and Backfill Over Utilidors
3.5 TESTS FOR DISPLACEMENT OF SEWERS
3.6 PAVEMENT REMOVAL
3.7 SELECTION OF BORROW MATERIAL

3.8 OPENING AND DRAINAGE OF EXCAVATION AND BORROW PITS
3.9 GRADING AREAS
3.10 BACKFILL
3.11 SUBGRADE PREPARATION
3.11.1 Construction
3.11.2 Compaction
3.11.2.1 Subgrade for Pavements
3.12 FINISHING
3.13 PLACING TOPSOIL
3.14 TESTING
3.15 SUBGRADE AND EMBANKMENT PROTECTION
3.16 WEATHER LIMITATIONS
3.17 REPAIR OF EXISTING WORK
3.18 CLEANING UP
3.19 ATTACHMENT

-- End of Section Table of Contents --

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.

ASTM INTERNATIONAL (ASTM)

ASTM C 117	(1995) Materials Finer Than 75 micrometer (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates
ASTM D 422	(1963; R 1998) Particle-Size Analysis of Soils
ASTM D 1140	(1997) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve
ASTM D 1556	(1990; R 1996el) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1991; R 1998) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu. m.)
ASTM D 2167	(1994) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2487	(2000) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	(1996el) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(1988; R 1996el) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 4318	(1998) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2003) Safety and Health Requirements

Manual

1.2 DEFINITIONS

1.2.1 Nonfrost Susceptible Soils

Nonfrost susceptible soils are inorganic soils containing less than 3 percent by weight of grains finer than 0.02 mm.

1.2.2 Satisfactory Materials

Satisfactory materials shall comprise any materials classified by ASTM D 2487 as GW, GP, GP-GM, GP-GC, GW-GM, GW-GC, SW, SW-SM, SW-SC, SP, SP-SM, and SP-SC, nonfrost susceptible material and containing not more than 60 percent by weight passing the No. 4 sieve. Testing required for classifying materials shall be in accordance with ASTM D 4318, ASTM D 422 and ASTM D 1140 as referenced in ASTM D 2487. Satisfactory materials for grading shall not exceed a size equally 2/3 of the specified lift thickness. Satisfactory materials for grading shall be comprised of stones less than 8 inches, except for fill material for pavements, utilities and railroads which shall be comprised of stones less than 3 inches in any dimension.

1.2.3 Unsatisfactory Materials

Materials that 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 contain roots, other organic matter or frozen material. The Contracting Officer shall be notified of any contaminated materials.

1.2.4 Classified Fill

Classified fill shall consist of non-frost susceptible materials meeting the requirements for satisfactory materials.

1.2.5 Unclassified Fill and Backfill

Unclassified fill and backfill shall be approved materials consisting of sand, gravel or other materials and shall be free of organic materials, frozen lumps, trash, lumber, or other debris. Material may be frost susceptible.

1.2.6 Fill

Fill is considered to be material placed above the original ground line.

1.2.7 Backfill

Backfill is considered to be material placed in an excavation made under this contract.

1.2.8 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic. Testing

required for classifying materials shall be in accordance with ASTM D 4318, ASTM C 136, ASTM D 422, and ASTM D 1140 as referenced in ASTM D 2487.

1.2.9 Degree of Compaction

Degree of compaction shall be as expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557.

1.2.10 Topsoil

Material suitable for use as topsoil shall be defined in SECTION 02921 SEEDING.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Compaction Test Plan;

The proposed locations of all compaction test, in 3 copies prior to commencing placing operations.

SD-06 Test Reports

Testing;

Within 24 hours of conclusion of physical tests, 6 copies of test results, including calibration curves and results of calibration tests.

SD-07 Certificates

Testing;

Certificate demonstrating the commercial testing laboratory has been inspected and approved by the Corps of Engineers.

1.4 SOURCE OF MATERIALS

Excavated material shall be used to the maximum extent possible for fill and backfill, or as directed. Only clean, non-contaminated material shall be used as backfill. Excavated material not used shall be wasted as directed, provided, however, that no material shall be wasted prior approval.

Classified fill, backfill and unclassified fill shall be obtained by selection from the excavated material. If the excavation is insufficient in quantity, or unsuitable, it shall be the Contractor's responsibility to obtain satisfactory borrow material. No borrow sources are available on Ft. Wainwright.

1.5 MAXIMUM DENSITY DETERMINATIONS

1.5.1 Definition

Degree of compaction shall be expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557.

1.5.2 Density Tests

a. Characteristics of backfill materials shall be determined in accordance with particle size analysis of soils ASTM D 422 and moisture-density relations of soils ASTM D 1557. A minimum of one particle size analysis and one moisture-density relation test shall be performed on each different type of material used for bedding and backfill.

b. Test shall be performed per paragraph TESTING. Field in-place density shall be determined in accordance with ASTM D 1556, ASTM D 2167, or ASTM D 2922. When ASTM D 2922 is used, the calibration curves shall be checked and adjusted using the sand cone method as described in paragraph Calibration of the ASTM publication. ASTM D 2922 results in a wet unit weight of soil and when using this method, ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in ASTM D 3017. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job, on each different type of material encountered, at intervals as directed by the Contracting Officer. Copies of calibration curves, results of calibration tests and laboratory density tests shall be furnished to the Contracting Officer.

1.6 SUBSURFACE DATA

Subsurface soil boring logs are appended to this section. Exploration consisting of drill holes have been made along Oak Avenue to assist the Contractor in ascertaining the character of the excavation material to be encountered and water table level; however, the Government does not guarantee that materials other than those disclosed by the drill hole will not be encountered, or that the proportions of the various materials will not vary from those indicated by the exploration. These data represent the best subsurface information available; however, variations may exist in the subsurface between boring locations.

1.7 BLASTING

Blasting will not be permitted.

1.8 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 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 CONSERVING OF TOPSOIL

Where area grading operations are to be performed, topsoil shall be stripped and separated from the grading operation. Topsoil shall be spread on areas already graded and prepared for topsoil, or transported and deposited in stockpiles convenient to areas that are to receive application of the topsoil later. Topsoil shall be kept separate from other excavated materials, brush, litter, objectionable weeds, roots, stones larger than 2 inches in diameter, and other materials that would interfere with planting and maintenance operations. Any surplus of topsoil from excavations and grading shall be removed from the site.

3.2 CLEARING AND GRUBBING

Unless otherwise shown, the areas within lines outside of each building and structure line shall be cleared and grubbed of trees, stumps, roots, brush and other vegetation, existing foundations, pavements, utility lines, and other items that would interfere with construction operations. Stumps, logs, roots more than 1-1/2 inch in diameter, and other organic or metallic debris shall be completely excavated and removed within building and structure lines, and shall be excavated and removed to a depth not less than 18 inches below original ground surfaces in the remainder of the cleared areas. The resulting depressions shall be completely filled and compacted in accordance with applicable paragraph of this specification unless further excavation is required. Building and utilities materials shown to be salvaged or to be re-installed in the work under this contract shall be removed carefully by workmen skilled in the particular trade involved.

3.2.1 Disposal of Cleared and Grubbed Material

Material removed and not designated as salvage material shall be disposed of outside the limits of Government-controlled property, except as specified in SECTION 01015 SPECIAL ITEMS.

3.3 EXCAVATION

3.3.1 General

The excavation shall conform to the dimensions, elevations and lines indicated on the drawings for the new utilidor structure except as specified below, and shall include trenching for utility systems, and all work incidental thereto. Walls of the excavation shall be as nearly vertical as practicable and shall conform to "Safety and Health Requirements", EM 385-1-1. The extent of excavation for the removal of undesirable materials such as frost susceptible materials has been determined from the results of the explorations and has been shown on the drawings as the excavation line. Any excavation beyond the authorized dimensions, elevations, and lines shall be backfilled with compacted classified material without cost to the Government. Unless otherwise shown on the drawings, excavation shall extend to a vertical line outside the projected exterior wall line to allow for placing and removal of forms, installation of services, and for inspection. Undercutting will not be permitted. Excavated material conforming to the contract specification requirements for materials to be used for embankments, fills, backfilling, grading, or topsoiling required for the project under the contract shall be considered as suitable. No materials shall be wasted or used for the convenience of the Contractor

unless so authorized. Contractor shall aerate or moisten soils materials as required to attain specified percent compaction.

3.3.2 Groundwater

The water table was measured at levels below the excavation lines of new work and is annotated on the attached Exploration Logs.

Excavations shall be performed in the dry. The excavation limits have been set above predicted groundwater levels at the site. If excavation activity encounters groundwater, the opened trench shall be backfilled to ground water elevation with classified fill and compacted to achieve best effort compaction. The remaining backfill shall be added and compacted as specified in paragraph FILL AND BACKFILL. The Contractor shall conduct excavation activities to protect the excavation from ponding due to precipitation and drainage.

3.3.3 Contaminated Soil

All excavated soils are to be field screen tested as specified in SECTION 02112 FIELD SCREEN TESTING FOR POL CONTAMINATION. Only clean, non-contaminated soil shall be used for backfill.

3.3.4 Field Modifications

If nonfrost susceptible soils are encountered within the depth below finished grade as indicated on the drawings for depth of excavation, the Contractor shall excavate only to depths such that the nonfrost susceptible materials are uncovered or to the bottom of the footing or slab whichever is greater. If unsuitable soil conditions, in the opinion of the Contracting Officer, are encountered at the excavation lines specified, (s)he may direct that extra excavation be performed.

3.3.5 Drainage

Excavation shall be performed in the dry. The excavation and the area immediately surrounding each excavation, including slopes and ditches, shall be continually and effectively drained away from the excavation. The excavation for inlet, outlet, and diversion ditches and the furnishing and operating of dewatering equipment, as necessary, shall be performed under this specification. Suitable precautions shall be taken to prevent any erosion from undercutting previously concreted footings and slabs. Excavations shall be kept free from ponding until the permanent work in the excavations has been completed and accepted, and the excavations have been completely backfilled.

3.3.6 Shoring

Shoring, including sheet piling, shall be installed during excavation where required for the protection of workmen, banks, adjacent paving, structures and utilities.

3.3.7 Disposal of Excavated Material

Suitable excavated material shall be placed in the proper section of the permanent work. Suitable excavated material in excess of that required for the work under this specification shall be used in other portions of the permanent site work required for the project under contract. Suitable material that cannot be placed readily in the permanent work

shall be separately stockpiled as directed. Dust control measures shall be utilized for stockpiled materials. Stockpiles shall be kept in a neat, well-drained and workable condition at all times. Material in excess of that required for the permanent work under this contract and any unsuitable material shall be disposed of at the base landfill.

3.3.8 Protection of Utilities

When utility lines are encountered within the area of operations, the Contractor shall notify the Contracting Officer in ample time for the necessary measures to be taken to prevent interruption of the service. The existing utilities to be retained and utilities constructed under this contract that are shown on the drawings or the location of which is made known to the Contractor prior to excavation shall be protected from damage during the excavation and backfilling and if damaged shall be repaired by the Contractor at its own expense. If the Contractor damages any existing utility lines that are not shown or the location of which is known to the Contractor, report thereof shall be made immediately to the Contracting Officer, repairs shall be made at rates determined or approved by the Contracting Officer. Inactive or abandoned utilities shall be removed and the remaining ends capped or plugged outside the building excavation line.

3.4 FILL AND BACKFILL

3.4.1 General

Classified fill and backfill shall be used in the areas designated on the drawings or hereinafter specified. Classified fill and backfill under pipe or conduit shall be placed in layers not exceeding 8 inches in thickness and thoroughly compacted to 95 percent of maximum density. Fill or backfill immediately under utilidors, footings, manholes, and similar structures shall be a minimum of 12 inches thick and shall be placed in layers not exceeding 6 inches in thickness compacted to a minimum of 95 percent of maximum density. Fill or backfill immediately under portland cement concrete slabs shall consist of classified material to a minimum thickness of 24 inches and shall be placed in layers not exceeding 6 inches in thickness compacted to 100 percent of maximum density. Portions of any layer in which the materials become segregated to the extent that the required percent compaction cannot be attained, shall be removed and replaced with satisfactory materials, or blended with additional material until segregation is eliminated and specified percent compaction can be attained. Prior to backfilling, all form lumber shall be removed and the excavated area cleaned of all trash and debris. No backfilling shall be done until construction work to be covered by backfill has been inspected and approved.

3.4.2 Backfilling of Trenches

The trenches shall not be backfilled until all required pressure and other tests are performed and until the utilities systems as installed conform to the requirements specified in the several sections covering the installation of the various utilities. Where, in the opinion of the Contracting Officer, damage is likely to result from withdrawing sheeting, the sheeting shall be left in place and the contract price will be adjusted accordingly. The trenches shall be carefully backfilled with excavated materials as required for backfilling, which shall be deposited in 6 inch layers and thoroughly and carefully rammed until the pipe has a cover not less than 12 inches above the top of the

pipe conduit. The sand shall be placed in 4 inch layers which shall be carefully tamped into place in a manner recommended by the manufacturer of the pipe or conduit. The remainder of the backfill material shall then be placed into the trench in 12 inch layers and tamped. Settling the backfill with water will not be permitted except when so directed by the Contracting Officer, and then only when the fill is noncohesive granular material and the backfill is under nontraffic area. Any trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth required for proper compaction, then refilled and compacted, with the surface restored to the required grade and compaction, mounded over and smoothed off. Open trenches across roadways or other areas to be surfaced shall be backfilled and compacted as indicated on the drawings, or if not indicated on the drawings, shall be backfilled with classified materials the entire depth of compaction, except the upper 6 inches shall be compacted to 100 percent compaction, so that surfacing of the area can proceed immediately after backfilling is completed. Along all other portions of the trenches, the ground shall be graded to a reasonable uniformity, and the mounding over the trenches shall be left in a uniform and neat condition.

3.4.3 Fill and Backfill Against Walls of Structures

Fill and backfill against walls of utilidors, manholes and similar structures shall be as shown on the drawings, or if not shown on the drawings, shall consist of unclassified material which shall be placed in horizontal layers not in excess of 8 inches in thickness and shall have a moisture content such that the required degree of compaction may be attained. The material shall be compacted by hand or machine tampers or by other suitable equipment to a degree of compaction that will prevent excessive settlement or shrinkage. Fill and backfill shall be brought to a suitable elevation above grade to provide for anticipated settlement and shrinkage thereof. Care shall be exercised to avoid undue pressure against unsupported walls.

3.4.4 Fill and Backfill Over Utilidors

Upon completion of the structure, fill and backfill shall be as shown on the drawings, or if not shown on the drawings, fill and backfill with unclassified material shall be used to effect top coverage and restore surface as nearly as practicable to match adjacent areas, with a minimum cover of 12 inches.

3.5 TESTS FOR DISPLACEMENT OF SEWERS

Direct burial sewer lines shall be checked in the presence of the Contracting Officer to determine whether any displacement of the pipe has occurred after the trench has been backfilled to 24 inches above the pipe and compacted as specified. The test will be as follows: A light or laser will be flashed between manhole and utilidor, or if the manholes have not as yet been constructed, between the locations of the manholes. If the illuminated interior of the pipe-line shows poor alignment or any other defects that, in the Contracting Officer's judgement, would cause improper functioning, the defects designated by the Contracting Officer shall be remedied by the Contractor at its expense.

The Contractor shall propose alternative methods of testing when testing by lamping or laser is not feasible. Alternative methods of testing shall be approved by the Contracting Officer prior to placement of sewer

piping in the trench.

3.6 PAVEMENT REMOVAL

Where necessary to remove existing concrete or asphalt pavement, the excavation shall be performed as indicated on the drawings, or if not indicated on the drawings, in a manner to prevent excessive breaking and spalling at the edges. Just prior to replacement of the pavement, the existing asphalt pavement shall be removed not less than 12 inches beyond firm subgrade on each side of the excavation, to the full depth of the pavement. Concrete pavement shall be removed to a joint. The cut shall be made with a concrete saw or similar abrasive and shall be true to line. The area shall then be repaired as indicated on the drawings, or if not indicated on the drawings, with surfacing of similar composition and thickness as the existing, flush with the adjacent unbroken pavement.

3.7 SELECTION OF BORROW MATERIAL

Borrow material shall be selected to meet the requirements and conditions of the particular fill or embankment for which it is to be used. Borrow material shall be obtained from the borrow areas of approved private sources. Unless otherwise provided in the contract, the Contractor shall obtain from the owners the right to procure material, pay royalties and other charges involved, and bear the expense of developing the sources, including rights-of-way for hauling. Unless specifically provided, no borrow shall be obtained within the limits of the project site without prior written approval. Necessary clearing, grubbing, and satisfactory drainage of borrow pits and the disposal of debris thereon shall be considered related operations to the borrow excavation.

3.8 OPENING AND DRAINAGE OF EXCAVATION AND BORROW PITS

The Contractor shall notify the Contracting Officer sufficiently in advance of the opening of any excavation or borrow pit to permit elevations and measurements of the undisturbed ground surface to be taken. Except as otherwise permitted, borrow pits and other excavation areas shall be excavated providing adequate drainage. Overburden and other spoil material shall be transported to designated spoil areas or otherwise disposed of as directed. Borrow pits shall be neatly trimmed and drained after the excavation is completed. The Contractor shall ensure that excavation of any area, operation of borrow pits, or dumping of spoil material results in minimum detrimental effects on natural environmental conditions.

3.9 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.

3.10 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. Compaction requirements for backfill materials shall also conform to the applicable portions of paragraphs FILL AND BACKFILL, SUBGRADE AND EMBANKMENT PROTECTION and SUBGRADE PREPARATION. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.11 SUBGRADE PREPARATION

3.11.1 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.

3.11.2 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 95 percent of laboratory maximum density.

3.11.2.1 Subgrade for Pavements

Subgrade for pavements shall be compacted to at least 100 percent of laboratory maximum density for the depth below the surface of the pavement shown.

3.12 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.

3.13 PLACING TOPSOIL

On areas to receive topsoil, the compacted subgrade soil shall be scarified to a 2 inch depth for bonding of topsoil with subsoil. Topsoil then shall be spread evenly to a thickness of 4 inches and graded to the elevations and slopes shown. Topsoil shall not be spread when frozen or excessively wet or dry. Material required for topsoil in excess of that produced by excavation within the grading limits shall be obtained from offsite areas.

3.14 TESTING

Compaction, gradation, and nonfrost susceptibility tests shall be performed on each layer of compacted material placed. Testing shall be the responsibility of the Contractor and shall be performed by an independent testing agency satisfactory to the Contracting Officer. The Contracting Officer may direct that the tests be taken at locations other than those shown on the submitted compaction test plan and that additional tests be taken to supplement these required tests. The Contractor shall remove and replace nonconforming materials and shall recompact and retest failed and replaced areas until the specified degree of compaction is obtained. The Contractor shall amend its submitted compaction test plan to show the exact location and number of tests taken. This plan shall be keyed to the test results. The record of each test shall reflect the type of test procedure and, for compaction tests, the volume or unit weight of the standard and the volume or unit weight of the compacted soil. The record shall also reflect the firm or person that performed the test, the project title, and contract number. The area referred to hereinafter which determines the minimum number of tests required shall be an area that is compacted in one continuous operation.

a. Subbase and classified materials in-place shall be sampled and tested for gradation and nonfrost susceptibility requirements at least once for every 100 cubic yards of compacted volume or portion thereof. Gradation shall be determined in accordance with ASTM C 136, with ASTM C 117 used to determine minus sieve material and ASTM D 422 used to determine minus material.

b. Base course in-place shall be sampled and tested in accordance with SECTION 02740 BASE COURSE AND BITUMINOUS PAVING FOR VEHICLE TRAFFIC AREAS, ADOT & PF Specifications, and as specified herein.

c. The following density tests are required for backfill in utility trenches.

1. Bedding Layers Under Utilities: One test per 200 linear feet of trench or a minimum of two tests, whichever is greater.

2. Trench Backfill in Graded Areas: Minimum of two tests per layer or one test per layer for each 300 linear feet of trench, whichever provides the greatest number of tests.

3. Trench Backfill in Traffic Areas: Minimum of two tests per layer or one test per layer for each 100 linear feet of trench, whichever provides the greatest number of tests.

4. Backfill in portland cement concrete slab areas: Minimum of two tests per layer for each 3000 square feet of area, whichever provides the greatest number of tests.

3.15 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 or pavement be placed on a muddy, spongy, or frozen subgrade.

3.16 WEATHER LIMITATIONS

It shall be the responsibility of the Contractor to protect all areas of completed work against any detrimental effects due to weather, by approved methods. Any areas of completed work that are damaged by freezing or rain, shall be reconditioned, reshaped and recompacted by the Contractor in conformance with the requirements of this specification without additional cost to the Government.

3.17 REPAIR OF EXISTING WORK

All sidewalks, fences, poles and any other existing feature that is to be retained but has been damaged or removed as a result of performance of the work shall be repaired or replaced in kind in a satisfactory manner.

3.18 CLEANING UP

The Contractor shall at all times keep the construction area, including storage areas used by it, free from accumulations of waste materials or rubbish and, prior to completion of the work, remove any rubbish from and about the premises and all tools, equipment and materials not the property of the Government. Upon completion of the construction, the Contractor shall leave the work and premises in a clean, neat and satisfactory condition.

3.19 ATTACHMENT

Soil Logs

ALASKA DISTRICT
CORPS OF ENGINEERS
ENGINEERING SERVICES

Soils and Geology Section

EXPLORATION LOG

Project:	*Ice Skating Rink Change House, FTW263 Fort Wainwight, Alaska*
Page	1 of 1
Date:	*1 Aug 2002*
Drilling Agency:	☒ Alaska District ☐ Other
Elevation Datum:	☒ MSL ☐ other
Location:	Northing: *3,959,702 ft.* Easting: *1,384,709 ft.*
Top of Hole Elevation:	*456.6 ft.*
Hole Number, Field:	*AP-1*
Permanent:	*AP-8104*
Operator:	*William Tester*
Inspector:	*Robert Weakland*
Type of Hole:	☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer
Depth to Groundwater:	*19.0 ft. GE*
Depth Drilled:	*24.5 ft.*
Total Depth:	*26.0 ft.*
Hammer Weight:	*340 lbs*
Split Spoon I.D:	*3 in.*
Size and Type of Bit:	*8 in. HSA with bullet bit*
Type of Equipment:	*CME 850 with Autohammer*
Type of Samples:	*Grab and Drive*

Depth (ft.)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (in.)	PID (ppm)	% Water	Description and Remarks
														Landscaped Lawn
		1		F2	GRAB	SM	Silty SAND with Gravel				1	0.6		Brown, moist, rounded gravel, fine to medium sand, nonplastic (NP) fines, FILL
2		2		F2	5 5 6	SM	Silty SAND with Gravel				1	0.6		Brown, moist, rounded gravel, fine to medium sand, NP fines, FILL
4		3		F2	4 5 6	SM	Silty SAND with Gravel				1	0.5		Brown, moist, subrounded to rounded gravel, fine sand, NP fines, some coal pieces, FILL
6		4		F2	2 2 4	SM	Silty SAND with Gravel				1	0.6		Brown, orange mottled, moist, rounded gravel, fine sand, NP fines, some coal pieces, FILL
8		5a		F2	3 5 6	SM	Silty SAND with Gravel					0.6		FILL
10		5b		NFS		SP	Poorly graded SAND					0.6		Brown, moist, medium sand
12														
14		6		NFS	3 5 7	SP	Poorly graded SAND with Gravel				1	0.6		Brown to gray, moist, subrounded to rounded gravel, medium sand
16														
18														
20		7			3 4 5	SP-SM	Poorly graded SAND with Silt and Gravel					0.6		Brown, wet, fine to medium sand, NP fines
22														
24														1.5 ft heaving sand
		8			3 2 3 7	GW	Well-graded GRAVEL with Sand				1			Gray, wet, subangular to subrounded gravel, medium to coarse sand
26														Bottom of Hole 26.0 ft. Elevation 430.6 ft. Groundwater Encountered: at depth 19.0 ft. PID = (Hot) Photo Ionization Detector
28														
30														
32														

EXPLORATION LOG FTW263.GPJ ACE_ANC.GDT 3/6/03

NPA Form 19-E
May 94 Prev. Ed. Obsolete

Project: *Ice Skating Rink Change House, FTW263*

Hole Number: *AP-8104*

ALASKA DISTRICT
CORPS OF ENGINEERS
ENGINEERING SERVICES

Soils and Geology Section

EXPLORATION LOG

Project:	*Ice Skating Rink Change House, FTW263 Fort Wainwight, Alaska*
Page	1 of 1
Date:	*1 Aug 2002*
Drilling Agency:	☒ Alaska District ☐ Other
Elevation Datum:	☒ MSL ☐ other
Location:	Northing: *3,959,704 ft.* Easting: *1,384,768 ft.*
Top of Hole Elevation:	*457.1 ft.*
Hole Number, Field:	*AP-2*
Permanent:	*AP-8105*
Operator:	*William Tester*
Inspector:	*Robert Weakland*
Type of Hole:	☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer
Depth to Groundwater:	*20.3 ft. GE*
Depth Drilled:	*29.5 ft.*
Total Depth:	*31.0 ft.*
Hammer Weight:	*340 lbs*
Split Spoon I.D:	*3 in.*
Size and Type of Bit:	*8 in. HSA with bullet bit*
Type of Equipment:	*CME 850 with Autohammer*
Type of Samples:	*Grab and Drive*

Depth (ft.)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (in.)	PID (ppm)	% Water	Description and Remarks
														Landscaped Lawn
		1			Grab	SM	Silty SAND with Gravel				1	0.6		Brown, moist, subangular to rounded gravel, fine to coarse sand, nonplastic fines (NP), FILL
2		2		F2	5 5 5	SM	Silty SAND with Gravel	20	37	43	2		4	Brown, moist, subrounded gravel, fine to medium sand, NP fines, FILL
4														
6		3		F4	3 3 3	SM	Silty SAND with Gravel	20	34	46	2		5	Brown, moist, subrounded to rounded gravel, fine to coarse sand, NP fines, FILL
8		4		F2	3 3 3	SM	Silty SAND with Gravel	24	35	41	1		9	Brown, moist, subrounded gravel, fine to medium sand, NP fines, FILL
10		5		F2	3 3 6	SM	Silty SAND							Brown to gray, moist, fine to medium sand, NP fines, possibly FILL
12														
14		6		NFS	4 5 4	SP	Poorly graded SAND with Gravel	44	62	4	2		3	Brown to gray, subrounded gravel, fine to medium sand
16														
18														
20		7			4 3 3	SP	Poorly graded SAND with Gravel							Brown to gray, subrounded gravel, fine to medium sand, NP fines
22														
24														0.5 ft heaving sand
26		8			1 2 2 2									No recovery, sample washed out
28														
30		9			3 5 5 3	GW-GM	Well-graded GRAVEL with Silt and Sand				2			Brown to gray, wet, subrounded gravel, fine to coarse sand, NP fines
32														Bottom of Hole 31.0 ft. Elevation 426.1 ft. Groundwater Encountered: at depth 20.3 ft. PID = (Hot) Photo Ionization Detector

NPA Form 19-E
May 94 Prev. Ed. Obsolete

Project: *Ice Skating Rink Change House, FTW263*

Hole Number: *AP-8105*

EXPLORATION LOG FTW263.GPJ ACE_ANC.GDT 3/6/03

ALASKA DISTRICT
CORPS OF ENGINEERS
ENGINEERING SERVICES

Soils and Geology Section

EXPLORATION LOG

Project: *Oak Avenue Utilities Upgrade (FTW268)*
Fort Wainwright, Alaska

Page 1 of 1

Date: *17 Nov 2002*

Drilling Agency: ☒ Alaska District ☐ Other

Elevation Datum: ☒ MSL ☐ other

Location: Northing: *3,959,749 ft.* Easting: *1,384,628 ft.*

Top of Hole Elevation: *452.4 ft.*

Hole Number, Field: *TB-1* Permanent: *AP-8394*

Operator: *William Tester*

Inspector: *James Robson*

Type of Hole: ☐ other _____
☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer

Depth to Groundwater: *NE*

Depth Drilled: *14.5 ft.*

Total Depth: *16.5 ft.*

Hammer Weight: *340 lbs*

Split Spoon I.D.: *3 in.*

Size and Type of Bit: *8 in. HSA with Bullet bit*

Type of Equipment: *CME 850 with Automatic Hammer*

Type of Samples: *Grab and Drive*

Depth (ft.)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (in.)	PID (ppm)	% Water	Description and Remarks Surface: grass north of fieldhouse, 1 in. snow
		1	Nbn	F4	Grab	ML	SILT					0.4		Dark brown, moist, subrounded gravel, fine to coarse sand, nonplastic (NP) fines, FILL
2, 4		2		F2	4 3 4 4	SM	Silty SAND	0	58	42		0.3	11	Yellow tan, moist, fine to medium sand, NP fines (silt coarsening downward to fine and medium sand)
6, 8, 10, 12		3		NFS	3 5 5	SW	Well-graded SAND with Gravel and Cobbles				>3	0.3		Tan, moist, rounded gravel, fine to coarse sand, cobbles fractured while driving
14, 16		4		NFS	3 3 4 4	SP	Poorly graded SAND with Gravel				2			Gray, moist to wet, subrounded gravel, fine to medium sand
18														Bottom of Hole 16.5 ft. Elevation 435.9 ft. Groundwater Not Encountered PID = (Hot) Photo Ionization Detector

EXPLORATION LOG FTW268.GPJ ACE_ANC.GDT 3/6/03

NPA Form 19-E
May 94 Prev. Ed. Obsolete

Project: *Oak Avenue Utilities Upgrade (FTW268)*

Hole Number: *AP-8394*

ALASKA DISTRICT
CORPS OF ENGINEERS
ENGINEERING SERVICES

Soils and Geology Section

EXPLORATION LOG

Project: *Oak Avenue Utilities Upgrade (FTW268)*
Fort Wainwright, Alaska

Page 1 of 1

Date: *17 Nov 2002*

Drilling Agency: ☒ Alaska District ☐ Other

Elevation Datum: ☒ MSL ☐ other

Location: Northing: *3,959,737 ft.* Easting: *1,385,240 ft.*

Top of Hole Elevation: *452.6 ft.*

Hole Number, Field: *TB-3* Permanent: *AP-8395*

Operator: *William Tester*

Inspector: *James Robson*

Type of Hole: ☐ other _____ ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer

Depth to Groundwater: *NE*

Depth Drilled: *14.5 ft.*

Total Depth: *16.5 ft.*

Hammer Weight: *340 lbs*

Split Spoon I.D: *3 in.*

Size and Type of Bit: *8 in. HSA with Bullet bit*

Type of Equipment: *CME 850 with Automatic Hammer*

Type of Samples: *Grab and Drive*

Depth (ft.)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (in.)	PID (ppm)	% Water	Description and Remarks Surface: grass
		1	Nbn	F3	Grab	SM	Silty SAND with Gravel					0.5		Yellow to brown, moist, angular gravel, fine to coarse sand, nonplastic (NP) fines, possible FILL
2														
4		2		NFS	3 2 3 3	SM	Silty SAND	1	85	14		0.5	3	Brown, moist, fine to medium sand, NP fines
6														
8														Wood in cuttings, creosote-like odor in wood
10		3		NFS	8 10 7	GW	Well-graded GRAVEL with Sand and Cobbles				>3	0.5		Light brown, moist, rounded gravel, fine to coarse sand
12														
14		4		NFS	4 5 6 5	GW	Well-graded GRAVEL with Sand				2	0.5		Olive, moist to wet, rounded gravel, fine to medium sand
16														
18														Bottom of Hole 16.5 ft. Elevation 436.1 ft. Groundwater Not Encountered PID = (Hot) Photo Ionization Detector

EXPLORATION LOG FTW268.GPJ ACE_ANC.GDT 3/6/03

NPA Form 19-E
May 94 Prev. Ed. Obsolete

Project: *Oak Avenue Utilities Upgrade (FTW268)*

Hole Number: *AP-8395*

ALASKA DISTRICT
CORPS OF ENGINEERS
ENGINEERING SERVICES

Soils and Geology Section

EXPLORATION LOG

Project:	*Oak Avenue Utilities Upgrade (FTW268)* *Fort Wainwright, Alaska*
Page	1 of 1
Date:	*17 Nov 2002*
Drilling Agency:	☒ Alaska District ☐ Other
Elevation Datum:	☒ MSL ☐ other
Location:	Northing: *3,959,730 ft.* Easting: *1,385,409 ft.*
Top of Hole Elevation:	*452.3 ft.*
Hole Number, Field:	*TB-4*
Permanent:	*AP-8396*
Operator:	*William Tester*
Inspector:	*James Robson*
Type of Hole:	☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer
Depth to Groundwater:	*14.7 ft. WD*
Depth Drilled:	*14.5 ft.*
Total Depth:	*16.5 ft.*
Hammer Weight:	*340 lbs*
Split Spoon I.D:	*3 in.*
Size and Type of Bit:	*8 in. HSA with Bullet bit*
Type of Equipment:	*CME 850 with Automatic Hammer*
Type of Samples:	*Grab and Drive*

Depth (ft.)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (in.)	PID (ppm)	% Water	Description and Remarks
														Surface: compacted gravel lot
		1	Nbn	F4	Grab	ML	SILT					0.5		Dark brown, frozen, fine to coarse sand, nonplastic (NP) fines, thin lense of gravel
2														
4														
		2a		F4	5	ML	SILT					0.5		Yellow to tan, moist, nonplastic (NP) fines
		2b		NFS	7 6 6	SW-SM	Well-graded SAND with Silt and Gravel	26	68	6	2	0.5	2	Tan, moist, rounded gravel, fine to medium sand
6														
8														
10		3		NFS	13 15 16	SW	Well-graded SAND with Gravel and Cobbles				>3	0.5		Tan, moist, rounded gravel, fine to coarse sand, cobbles fractured while driving
12														
14														
		4		PFS	7 5 9 8	GW	Well-graded GRAVEL with Sand				3			Brownish orange, wet, rounded gravel, fine to coarse sand
16														
18														Bottom of Hole 16.5 ft. Elevation 435.8 ft. Groundwater Encountered While Drilling: at depth 14.7 ft. PID = (Hot) Photo Ionization Detector

EXPLORATION LOG FTW268.GPJ ACE_ANC.GDT 3/6/03

NPA Form 19-E
May 94 Prev. Ed. Obsolete

Project: *Oak Avenue Utilities Upgrade (FTW268)*

Hole Number: *AP-8396*

ALASKA DISTRICT
CORPS OF ENGINEERS
ENGINEERING SERVICES

Soils and Geology Section

EXPLORATION LOG

Project: *Oak Avenue Utilities Upgrade (FTW268)*
Fort Wainwright, Alaska

Page 1 of 1

Date: *17 Nov 2002*

Drilling Agency: ☒ Alaska District ☐ Other

Elevation Datum: ☒ MSL ☐ other

Location: Northing: *3,959,728 ft.* Easting: *1,385,530 ft.*

Top of Hole Elevation: *452.1 ft.*

Hole Number, Field: *TB-5* Permanent: *AP-8397*

Operator: *William Tester*

Inspector: *James Robson*

Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer

Depth to Groundwater: *14.5 ft. WD*

Depth Drilled: *14.5 ft.*

Total Depth: *16.0 ft.*

Hammer Weight: *340 lbs*

Split Spoon I.D.: *3 in.*

Size and Type of Bit: *8 in. HSA with Bullet bit*

Type of Equipment: *CME 850 with Automatic Hammer*

Type of Samples: *Grab and Drive*

Depth (ft.)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (in.)	PID (ppm)	% Water	Description and Remarks
														Surface: 1 in. asphalt
		1	Nbn	NFS	Grab	SW	Well-graded SAND with Gravel				1	8.5		Grayish tan, frozen to moist, rounded gravel, fine to coarse sand, FILL
2														
4		2a		F4	3 5	ML	SILT					0.4		Yellow, moist, nonplastic (NP) fines
6		2b		NFS	7	SW	Well-graded SAND with Gravel				1	0.4		Gray, moist, rounded gravel, fine to coarse sand
8														
10		3		NFS	5 5 4 4	GP	Poorly graded GRAVEL with Sand and Cobbles	67	30	3	>3	0.5	2	Reddish brown, moist, rounded gravel, fine to coarse sand, limonite cement coating material
12														
14		4		NFS	8 8 8	GW	Well-graded GRAVEL with Sand				2	0.5		Brown, moist to wet, rounded gravel, fine to coarse sand
16														Bottom of Hole 16.0 ft. Elevation 436.1 ft. Groundwater Encountered While Drilling: at depth 14.5 ft. PID = (Hot) Photo Ionization Detector
18														

NPA Form 19-E
May 94 Prev. Ed. Obsolete

Project: *Oak Avenue Utilities Upgrade (FTW268)*

Hole Number: *AP-8397*

EXPLORATION LOG FTW268.GPJ ACE_ANC.GDT 3/6/03

ALASKA DISTRICT
CORPS OF ENGINEERS
ENGINEERING SERVICES

Soils and Geology Section

EXPLORATION LOG

Project: *Oak Avenue Utilities Upgrade (FTW268)*
Fort Wainwright, Alaska

Page 1 of 1

Date: *17 Nov 2002*

Drilling Agency: ☒ Alaska District ☐ Other

Elevation Datum: ☒ MSL ☐ other

Location: Northing: *3,959,724 ft.* Easting: *1,385,727 ft.*

Top of Hole Elevation: *451.7 ft.*

Hole Number, Field: *TB-6* Permanent: *AP-8398*

Operator: *William Tester*

Inspector: *James Robson*

Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer

Depth to Groundwater: *14.0 ft. WD*

Depth Drilled: *14.5 ft.*

Total Depth: *16.5 ft.*

Hammer Weight: *340 lbs*

Split Spoon I.D.: *3 in.*

Size and Type of Bit: *8 in. HSA with Bullet bit*

Type of Equipment: *CME 850 with Automatic Hammer*

Type of Samples: *Grab and Drive*

Depth (ft.)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (in.)	PID (ppm)	% Water	Description and Remarks
														Surface: 3.5 in. asphalt
		1	Nbn	PFS	Grab	SW	Well-graded SAND with Gravel				1	0.5		Gray, frozen to moist, rounded gravel, fine to coarse sand, FILL
2														
4		2		F4	4 3 4 5	ML	SILT					0.5		Olive, moist, fine to coarse sand, nonplastic (NP) fines
6														
8														
10		3		NFS	2 1 2	SP-SM	Poorly graded SAND with Silt	2	91	7		0.5	9	Grayish brown, moist, medium sand, 2.5 in. of reddish wood
12														
14		4		NFS	4 2 1 4	GW	Well-graded GRAVEL with Cobbles				>3			Tan, wet, rounded gravel, fine to coarse sand
16														
18														Bottom of Hole 16.5 ft. Elevation 435.2 ft. Groundwater Encountered While Drilling: at depth 14.0 ft. PID = (Hot) Photo Ionization Detector

NPA Form 19-E
May 94 Prev. Ed. Obsolete

Project: *Oak Avenue Utilities Upgrade (FTW268)*

Hole Number: *AP-8398*

EXPLORATION LOG FTW268.GPJ ACE_ANC.GDT 3/6/03

ALASKA DISTRICT
CORPS OF ENGINEERS
ENGINEERING SERVICES

Soils and Geology Section

EXPLORATION LOG

Project: *Oak Avenue Utilities Upgrade (FTW268)*
Fort Wainwright, Alaska

Page 1 of 1

Date: *17 Nov 2002*

Drilling Agency: ☒ Alaska District ☐ Other

Elevation Datum: ☒ MSL ☐ other

Location: Northing: *3,959,780 ft.* Easting: *1,386,316 ft.*

Top of Hole Elevation: *449.3 ft.*

Hole Number, Field: *TB-7* Permanent: *AP-8399*

Operator: *William Tester*

Inspector: *James Robson*

Type of Hole: ☐ other _____
☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer

Depth to Groundwater: *12.2 ft. WD*

Depth Drilled: *14.0 ft.*

Total Depth: *16.0 ft.*

Hammer Weight: *340 lbs*

Split Spoon I.D.: *3 in.*

Size and Type of Bit: *8 in. HSA with Bullet bit*

Type of Equipment: *CME 850 with Automatic Hammer*

Type of Samples: *Grab and Drive*

Depth (ft.)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (in.)	PID (ppm)	% Water	Description and Remarks Surface: ditch with grass
		1	Nbn	F4	Grab	ML	SILT					0.5		Yellow, frozen to moist, fine sand, nonplastic (NP) fines
2														3-in. sand lense
4		2		F4	2 2 1 2	ML	SILT with Sand	0	26	74		0.5	25	Gray and yellow, moist, NP fines
6														
8														
		3		NFS	4 8 8	SW	Well-graded SAND with Gravel				2	0.5		Light brown, moist, rounded gravel, fine to coarse sand
10														
12														
14		4		PFS	4 10 6 10	GP	Poorly graded GRAVEL with Sand				2			Gray to brown, wet, rounded gravel, fine to coarse sand
16														Bottom of Hole 16.0 ft. Elevation 433.3 ft. Groundwater Encountered While Drilling: at depth 12.2 ft. PID = (Hot) Photo Ionization Detector
18														

NPA Form 19-E
May 94 Prev. Ed. Obsolete

Project: *Oak Avenue Utilities Upgrade (FTW268)*

Hole Number: *AP-8399*

EXPLORATION LOG FTW268.GPJ ACE_ANC.GDT 3/6/03

ALASKA DISTRICT
CORPS OF ENGINEERS
ENGINEERING SERVICES

Soils and Geology Section

EXPLORATION LOG

Project: *Oak Avenue Utilities Upgrade (FTW268)*
Fort Wainwright, Alaska

Page 1 of 1

Date: *17 Nov 2002*

Drilling Agency: ☒ Alaska District ☐ Other

Elevation Datum: ☒ MSL ☐ other

Location: Northing: *3,959,731 ft.* Easting: *1,386,791 ft.*

Top of Hole Elevation: *452.1 ft.*

Hole Number, Field: *TB-8* Permanent: *AP-8400*

Operator: *William Tester*

Inspector: *James Robson*

Type of Hole: ☐ other ☐ Test Pit ☒ Auger Hole ☐ Monitoring Well ☐ Piezometer

Depth to Groundwater: *13.7 ft. WD*

Depth Drilled: *14.5 ft.*

Total Depth: *16.5 ft.*

Hammer Weight: *340 lbs*

Split Spoon I.D.: *3 in.*

Size and Type of Bit: *8 in. HSA with Bullet bit*

Type of Equipment: *CME 850 with Automatic Hammer*

Type of Samples: *Grab and Drive*

Depth (ft.)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2488	%Gravel	%Sand	%Fines	Max Size (in.)	PID (ppm)	% Water	Description and Remarks Surface: cleared lot
		1	Nbn	F3	Grab	ML	SILT	11	47	42	1	0.3	11	Brown, frozen to moist, rounded gravel, fine to coarse sand, nonplastic (NP) fines
2														
4		2		NFS	2 4 7	GP	Poorly graded GRAVEL with Sand	52	43	5	2	0.3	2	Brown, moist, rounded gravel, fine to medium sand
6														
8														
10		3		NFS	4 6 9 10	GW	Well-graded GRAVEL with Sand and Cobbles				>3	0.4		Olive, moist, rounded gravel, fine to medium sand
12														
14		4		NFS	5 3 3 5	SP	Poorly graded SAND				1			Gray, moist to wet, rounded gravel, fine to medium sand
16														
18														Bottom of Hole 16.5 ft. Elevation 435.6 ft. Groundwater Encountered While Drilling: at depth 13.7 ft. PID = (Hot) Photo Ionization Detector

NPA Form 19-E
May 94 Prev. Ed. Obsolete

FTW268)

Hole Number: *AP-8400*

EXPLORATION LOG FTW268.GPJ ACE_ANC.GDT 3/6/03

--END OF SECTION--

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02511

WATER DISTRIBUTION SYSTEMS IN UTILIDORS

PART 1 GENERAL

1.1 REFERENCES
1.2 PIPING
1.2.1 Piping for Water Distribution Lines
1.2.2 Piping for Water Service Lines
1.2.3 Piping for Fire Lines
1.2.4 Standard Products
1.3 SUBMITTALS
1.4 SUBMITTALS SUPPLEMENTAL
1.4.1 Materials
1.4.2 Pipe Supports
1.4.3 Anchors
1.4.4 Manufacturer's Recommendations
1.4.5 Hydrostatic tests
1.4.6 Disinfection

PART 2 PRODUCTS

2.1 MATERIALS
2.2 PIPE
2.2.1 Ductile-Iron Pipe
2.2.2 Galvanized-Steel Pipe, Less Than 4 Inches
2.2.3 Copper Tubing
2.3 JOINTS
2.3.1 Ductile-Iron Pipe
2.3.1.1 Mechanical Joints
2.3.1.2 Restrained Push-On Joint Fittings
2.3.1.3 Flanges
2.3.2 Steel Pipe, Galvanized
2.3.2.1 Mechanical Joints
2.3.2.2 Flanges
2.3.3 Copper Tubing
2.4 ISOLATION JOINTS
2.5 FITTINGS AND SPECIALS
2.5.1 For Ductile-Iron Pipe
2.5.2 For Galvanized-Steel Pipe Less Than 4 Inches
2.5.3 Copper Tubing System
2.6 VALVES
2.6.1 Gate Valves
2.6.2 Combination Air Valves
2.6.3 Hose Bib
2.6.4 Ball Valve
2.7 FIRE HYDRANTS
2.8 DISINFECTION
2.9 GALVANIZED COATINGS
2.10 MASTIC
2.11 INSULATION AND JACKETING

2.11.1 Insulation for Piping in Utilidors
2.11.2 Aluminum Jacket
2.11.3 Nonmetallic Jacket
2.11.4 Bands
2.11.5 Insulation for Flanges, Unions, and Fittings
2.11.6 Insulation Thickness
2.11.7 Water Valve and Equipment Insulation Cover
2.12 COAL-TAR COATING
2.13 POLYURETHANE AND POLYISOCYANURATE INSULATION
2.14 POLYSTYRENE INSULATION
2.15 SERVICE CLAMPS
2.16 TAPPING SLEEVES
2.17 PIPE ALIGNMENT GUIDES
2.17.1 Insulation Inserts at Pipe Supports and Pipe Carriers

PART 3 EXECUTION

3.1 INSTALLATION
3.2 HANDLING
3.3 CUTTING OF PIPE
3.4 PIPE SUPPORTS AND HANGERS
3.4.1 Pre-Cast Concrete Block Pipe Support
3.4.2 Pipe Support Racks
3.5 JOINT DEFLECTION
3.6 PLACING AND LAYING
3.6.1 Connections
3.7 JOINTING
3.7.1 Ductile-Iron Pipe
3.7.2 Steel Pipe, Not Galvanized
3.7.2.1 Mechanical Couplings
3.7.2.2 Rubber Gaskets
3.7.2.3 Welding
3.7.3 Galvanized-Steel Pipe
3.7.3.1 Screw Joints
3.7.3.2 Welding
3.7.4 Copper Tube
3.7.5 Isolation Joints
3.7.6 Transition Fittings
3.8 INSTALLATION OF SERVICE LINES
3.9 FIELD COATING AND LINING OF PIPE
3.9.1 Pipe 3 Inches and Larger
3.9.1.1 Cement-Mortar Coating and Lining
3.9.1.2 Galvanized-Steel Pipe
3.10 SETTING OF FIRE HYDRANTS
3.10.1 Fire Hydrants
3.10.2 Hydrants, After Delivery
3.11 CHECK VALVES AND VACUUM AND AIR RELIEF VALVES
3.12 TEES, CROSSES, AND WYES
3.13 THRUST RESTRAINT
3.14 EXPANSION JOINTS
3.14.1 Bellows Type Joints
3.14.2 Cut Grooved Pipe Type Coupling Expansion Joints
3.14.3 Restrained Push-On Joints
3.15 ALIGNMENT GUIDES
3.15.1 General
3.16 ANCHORS
3.17 INSULATION
3.17.1 General Requirements
3.17.2 Insulation

3.17.3 Aluminum-Jacket
3.17.4 Nonmetallic Jacket
3.18 HYDROSTATIC TESTS
3.18.1 Hydrostatic Test
3.18.2 Time for Making Test
3.18.3 Concurrent Hydrostatic Tests
3.18.3.1 Hydrostatic Tests and Disinfection
3.19 DISINFECTI0N
3.20 CLEANUP

-- End of Section Table of Contents --

SECTION 02511

WATER DISTRIBUTION SYSTEMS IN UTILIDORS

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.

ASME INTERNATIONAL (ASME)

ASME B16.26	(1988) Cast Copper Alloy Fittings for Flared Copper Tubes

ASTM INTERNATIONAL (ASTM)

ASTM A 36/A 36M	(2000a) Carbon Structural Steel
ASTM A 47	(1999) Ferritic Malleable Iron Castings
ASTM A 48	(2000) Gray Iron Castings
ASTM A 53	(2001) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
ASTM A 123/A 123M	(2001a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 126	(1995; R 2001) Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A 307	(1993) Alloy Steel Bolting Materials for Low-Temperature Service
ASTM A 536	(1994; 1999e1) Ductile Iron Castings
ASTM A 563	(2000) Carbon and Alloy Steel Nuts
ASTM A 780	(2000) Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM B 209	(2000) Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B 32	(2000) Solder Metal
ASTM B 88	(1999) Seamless Copper Water Tube
ASTM C 272	(1991; R 1996) Water Absorption of Core Materials for Structural Sandwich Constructions
ASTM C 518	(1991) Steady-State Heat Flux

	Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
ASTM D 1621	(2000) Compressive Properties of Rigid Cellular Plastics
ASTM D 2000	(2000) Rubber Products in Automotive Applications
ASTM D 2842	(2001) Water Absorption of Rigid Cellular Plastics
ASTM D 4586	(2000) Asphalt Roof Cement, Asbestos Free

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA B300	(1999) Hypochlorites
AWWA B301	(1999) Liquid Chlorine
AWWA C104	(1995) Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
AWWA C110	(1998) Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (75 mm through 1200 mm), for Water and Other Liquids
AWWA C111	(2000) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C115	(1999) Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges
AWWA C151	(1996) Ductile-Iron Pipe, Centrifugally Cast, for Water
AWWA C203	(1997) Coal-Tar Protective Coatings and Lining for Steel Water Pipelines - Enamel and Tape - Hot Applied
AWWA C205	(1995) Cement-Mortar Protective Lining and Coating for Steel Water Pipe - 4 in. and Larger - Shop Applied
AWWA C207	(2001) Steel Pipe Flanges for Waterworks Service - Sizes 4 In. Through 144 In. (100 mm Through 3,600 mm)
AWWA C500	(1993) Metal-Seated Gate Valves for Water Supply Service
AWWA C502	(1994) Dry-Barrel Fire Hydrants
AWWA C512	(1999) Air Release, Air/Vacuum, and Combination Air Valves for Waterworks Service

AWWA C600	(1999) Installation of Ductile-Iron Water Mains and Their Appurtenances
AWWA C606	(1997) Grooved and Shouldered Joints
AWWA C651	(1999) Disinfecting Water Mains

ASME INTERNATIONAL (ASME)

ASME B16.3	(1998) Malleable Iron Threaded Fittings

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS SP-110	(1996) Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends
MSS SP-80	(1997) Bronze Gate, Globe, Angle and Check Valves

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 325M	(1991) Fire Hazard Properties of Flammable Liquids, Gases and Volatile Solids
NFPA 24	(1995) Installation of Private Fire Service Mains and Their Appurtenances
NFPA 49	(1994) Hazardous Chemicals Data
NFPA 704	(1996) Identification of the Fire Hazards of Materials for Emergency Response

NSF INTERNATIONAL (NSF)

NSF 61	(2002e) Drinking Water System Components - Health Effects

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC Paint 21	(1991) White or Colored Silicone Alkyd Paint
SSPC Paint 25	(1997) Oxide, Zinc Oxide, Raw Linseed Oil and Alkyd Primer (Without Lead or Chromate Pigments).

1.2 PIPING

This section covers water distribution lines, water service lines, connections to building services as shown on the drawings, fire lines and fire hydrants. The Contractor shall have a copy of the manufacturer's recommendations for each material or procedure to be utilized available at the construction site at all times.

1.2.1 Piping for Water Distribution Lines

Piping for water distribution lines shall be ductile iron, unless otherwise shown or specified.

1.2.2 Piping for Water Service Lines

Piping for water service lines less than 4 inches and greater than or equal to 3 inches in diameter shall be galvanized steel or ductile iron, unless otherwise shown or specified. Piping for water service lines less than 3 inches shall be copper tubing, unless otherwise shown or specified.

1.2.3 Piping for Fire Lines

Piping for fire lines shall be ductile iron.

1.2.4 Standard Products

The equipment to be furnished under this specification shall be essentially the standard product of the manufacturer. Where two or more units of the same class of equipment are required, these units shall be the products of a single manufacturer; however, the component parts of the system need not be the products of the same manufacturer. The products of any reputable manufacturer regularly engaged in the commercial production of water distribution equipment will not be excluded on the basis of minor differences, provided all essential requirements of this specification relative to materials, capacity and performance are met.

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

Materials

Alignment Guides

Hangers

Couplings

Gaskets

Pipe

Valves

Fire Hydrants

Fittings

Pipe Supports

Anchors

SD-08 Manufacturer's Instructions

Manufacturer's Recommendations

SD-06 Test Reports

Hydrostatic tests

Disinfection

1.4 SUBMITTALS SUPPLEMENTAL

See paragraphs below for further descriptions of submittals required by paragraph SUBMITTALS:

1.4.1 Materials

Manufacturer's descriptive data, catalog cuts, and brochures for each type and size of the following: alignment guides, and expansion joints.

1.4.2 Pipe Supports

Calculation of pipe supports shall be submitted with support system descriptive data, see submittal in SECTION 02560 UTILIDOR SYSTEM.

1.4.3 Anchors

Calculation of pipe anchors shall be submitted with anchor sizes and drawings showing location and details of anchor. At a minimum anchors shall be placed near the locations shown on the drawings.

1.4.4 Manufacturer's Recommendations

Manufacturer's recommendations for each material or procedure to be utilized which is required to be in accordance with such recommendations. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions unless otherwise directed by the Contracting Officer.

1.4.5 Hydrostatic tests

Submit a hydrostatic test procedure describing method including method proposed for disposal of wastewater.

1.4.6 Disinfection

Submit a disinfection and test procedure describing method of disinfection with drawings showing proposed flush points, proposed chlorine injection points, method for disposal of wastewater and proposed sampling locations 30 days prior to disinfection being conducted. Submit satisfactory test results conducted by a laboratory certified by the State of Alaska.

PART 2 PRODUCTS

2.1 MATERIALS

Materials shall conform to the respective specifications and other requirements specified below: Pipe and fittings that are connected to anchors shall be steel. All water system components shall comply with NSF 61 requirements.

2.2 PIPE

2.2.1 Ductile-Iron Pipe

Ductile-Iron pipe shall conform to AWWA C151, Class 53, working pressure not less than 150 psi, unless otherwise shown or specified. Pipe shall be cement-mortar lined in accordance with AWWA C104. Linings shall be standard. Pipe 4 inches and larger shall be ductile iron.

2.2.2 Galvanized-Steel Pipe, Less Than 4 Inches

Galvanized steel pipe shall conform to ASTM A 53, standard weight.

2.2.3 Copper Tubing

Copper tubing shall conform to ASTM B 88, Type K, annealed.

2.3 JOINTS

2.3.1 Ductile-Iron Pipe

2.3.1.1 Mechanical Joints

Mechanical joints shall be of the restrained stuffing box type and shall conform to AWWA C606. Pipe joints shall be cut grooved and shouldered joints in accordance with AWWA C606 with a minimum working pressure of 150 psi. The coupling shall provide for full circumferential bearing against the face of the pipe groove or shoulder end, with a positive locking action when the components being joined are in line. Restrained joints shall be of the type that cannot be separated without failure of the pipe joint material.

Rubber gaskets and lubricants shall be as specified by the manufacturer of the jointing system and shall conform to the applicable requirements of ASTM D 2000.

2.3.1.2 Restrained Push-On Joint Fittings

Restrained Push-on joints shall conform to AWWA C111. Restrained push-on joint fittings shall be TR Flex Fittings as manufactured by U.S. Pipe or Flex-Ring Fittings as manufactured by American Pipe, or equal.

Rubber gaskets and lubricant shall be as specified by the manufacturer of the jointing system and shall conform to the applicable requirements of AWWA C111.

2.3.1.3 Flanges

Flanges shall conform to AWWA C115 and/or AWWA C110. Flanges shall be flat faced.

2.3.2 Steel Pipe, Galvanized

2.3.2.1 Mechanical Joints

Pipe joints for steel piping 2 inches and larger shall be cut grooved and shouldered joints in accordance with AWWA C606 with a minimum working pressure of 150 psi. All joints are to be flexible and use the same gasket material as specified for ductile iron pipe.

2.3.2.2 Flanges

Flanges shall conform to AWWA C207. Flanges shall be flat faced.

2.3.3 Copper Tubing

Joints shall be solder type.

2.4 ISOLATION JOINTS

Isolation joints shall be installed between nonthreaded ferrous and nonferrous metallic pipe, fittings, and valves. Isolation joints shall consist of a sandwich-type flange isolation gasket of the dielectric type, isolation washers, and isolation sleeves for flange bolts. Isolation gaskets shall be full faced with outside diameter equal to the flange outside diameter. Bolt isolation sleeves shall be full length. Units shall be of a shape to prevent metal-to-metal contact of dissimilar metallic piping elements and shall be suitable for the required working pressure.

2.5 FITTINGS AND SPECIALS

Fittings and specials for ductile-iron pipe and steel pipe may be interchanged where applicable. Mating surfaces between steel and iron flanges shall be plain faced. Protective materials for fittings and specials that cannot be mechanically lined and coated shall be lined and coated by hand using the same materials as are used for the pipe with the same number of applications of each material carefully and smoothly applied.

2.5.1 For Ductile-Iron Pipe

Fittings and specials shall have a pressure rating no less than that of adjoining pipe, unless otherwise specified. Fittings and specials for flanged joint pipe shall conform to AWWA C110. Fittings required on the drawings that are not covered in AWWA C110 shall have AWWA flanges and be based on AWWA C110 design principles. Fittings and specials for cut grooved and shouldered end pipe shall conform to AWWA C606 without field preparation. Malleable iron shall be ASTM A 47. Ductile iron shall be ASTM A 536.

2.5.2 For Galvanized-Steel Pipe Less Than 4 Inches

Steel fittings shall be galvanized. Screwed fittings shall conform to ASME B16.3. Flanged fittings shall conform to AWWA C207. Dresser-type fitting shall not be used.

2.5.3 Copper Tubing System

Fittings and specials shall be flared and conform to ASME B16.26.

2.6 VALVES

2.6.1 Gate Valves

Gate valves shall be designed for a working pressure of not less than 150 psi. Valve connections shall be as required for the piping in which they are installed. Valves shall have a clear waterway equal to the full nominal diameter of the valve, and shall be opened by turning counterclockwise. The operating wheel shall have an arrow cast in the metal, indicating the direction of opening.

a. Valves 2 inches and smaller shall be union bonnet all bronze and shall conform to MSS SP-80, Type 1, Class 150.

b. Valves larger than 2 inches shall be iron body, bronze mounted, and shall conform to AWWA C500, Class 125. Valves shall be non-rising stem and no raised faces.

2.6.2 Combination Air Valves

Combination air valves shall be single housing, combining both an air/vacuum relief valve and an air release valve. The air/vacuum portion shall automatically exhaust large quantities of air during filling of the pipeline and automatically relieve vacuum during draining of the pipeline. The air/vacuum large orifice size shall be a minimum of 2 inches. The air release portion shall automatically release small pockets of air that collect during operation. The small orifice size shall be 3/32 inches. Bodies and covers shall be of gray cast iron conforming to ASTM A 126, Class B, or ASTM A 48, Class 35, or ductile iron conforming to ASTM A 536, Grade 65-45-12, with stainless steel or plastic float. The valves shall be manufactured and tested in accordance with AWWA C512. Valve shall be as manufactured by Val-Matic Valve and Manufacturing Corp., Elmhurst, IL, or equal.

2.6.3 Hose Bib

Hose bib shall be brass with 3/4 inch male inlet threads, hexagon shoulder, and 3/4 inch hose connection. Faucet handle shall be securely attached to stem. Hose bib shall incorporate a threaded cap for the male end with chain securely fastened to bib.

2.6.4 Ball Valve

Threaded ends 2 inch and smaller: 400# WOG., forged brass two piece body, hard chrome plated forged brass ball, true adjustable packing nut ("O"-ring only type stem seal not acceptable), blow-out proof stem meeting Manufacturers Standardization Society MSS SP-110.

2.7 FIRE HYDRANTS

Hydrants shall be dry-barrel type conforming to AWWA C502 with valve opening at least 5 inches in diameter and designed so that the flange at the main valve seat can be removed with the main valve seat apparatus remaining intact, closed and reasonably tight against leakage and with a breakable valve rod coupling and breakable flange connections located no more than 8 inches above the ground or concrete lid. Hydrants shall have a 6 inch bell connection, two 2-1/2 inch hose connections and one 4-1/2 inch pumper connection. Outlets shall have American National Standard fire-hose coupling threads. Working parts shall be bronze. Design, material and workmanship shall be similar and equal to the latest stock pattern ordinarily produced by the manufacturer. The

exterior of fire hydrants below the breakable coupling shall be painted as specified for pipes inside the utilidor, with the added requirement of two (total) coats of the asphalt varnish. Hydrants shall be painted with one coat of zinc oxide primer conforming to SSPC Paint 25, and two finish coats of silicone alkyd enamel conforming to SSPC Paint 21, of the installation's standard colors or as directed by the Contracting Officer. Suitable bronze adapter for each outlet, with caps, shall be furnished. Hydrants shall be Mueller or equal.

2.8 DISINFECTION

Chlorinating materials shall conform to the following:

Chlorine, Liquid: AWWA B301.

Hypochlorite, Calcium and Sodium: AWWA B300.

2.9 GALVANIZED COATINGS

Repair shall conform to ASTM A 780 for damaged and uncoated areas of hot-dip galvanized coating.

2.10 MASTIC

Mastic shall conform to ASTM D 4586, Type I.

2.11 INSULATION AND JACKETING

2.11.1 Insulation for Piping in Utilidors

Insulation for piping, fittings, and valves shall be closed cell elastomer foam rubber, polyurethane foam, polyethylene foam, or extruded polystyrene. Insulation for piping, fittings, and valves in manholes and to a point 5 feet into the utilidors shall be the same as specified for the main lines. Insulation shall be factory or field applied. Laminated construction shall not be used. Insulation on piping in utilidor shall be covered with aluminum or nonmetallic jacket and insulation in manholes shall be covered with an aluminum jacket.

2.11.2 Aluminum Jacket

Jacket shall be smooth sheet, 0.016 inch nominal thickness; ASTM B 209, Type 3003, 3105, or 5005.

2.11.3 Nonmetallic Jacket

Nonmetallic jackets shall be of the AWJ (All Weather Jacket) type. Nonmetallic jacket shall consist of a 0.042 pounds per square foot fiberglass fabric impregnated with chlorosulfonated polyethylene (Hypalon)and a 0.0015-inch (1.5 mils) polyvinyl fluoride film (Tedlar) bonded to it. Overall thickness of the composite shall be 0.01 inch and weigh approximately 0.073 pounds per square foot. Jacket may be either field or factory applied to the insulation.

2.11.4 Bands

Bands for aluminum jacket shall be 3/8 inch wide and 32 gauge thickness made of aluminum or annealed stainless steel. Bands for insulation shall be 1/2 inch wide and 32 gauge thickness made of annealed stainless

steel.

2.11.5 Insulation for Flanges, Unions, and Fittings

Flanges, unions, and fittings shall be insulated with removable and reusable jackets. The insulation shall have essentially the same thermal characteristics and thickness as the adjoining piping. Removable valve blankets shall be secured with nylon straps and buckles.

2.11.6 Insulation Thickness

Provide pipe insulation thicknesses according to the following schedule:

Pipe size	Insulation Thickness
3/4"	1"
1" and larger	1-1/2"
In manhole and 5 feet into utilidor	1"

2.11.7 Water Valve and Equipment Insulation Cover

a. Removable, one-piece sewn cover construction with Velcro fasteners.

b. Thread: High temperature bonded multi-filament, Teflon coated. Rated for 475 degrees F maximum.

c. Seams: Double sewn, 8 stitches per inch minimum.

d. Closures: 2 inch minimum flap. Provide end closures with drawstrings.

e. Jacket: Silicon coated fiberglass fabric, 16 ounce/square yard minimum.

f. Insulation: 2 inch thick Owens Corning thermal insulation wool or equal.

2.12 COAL-TAR COATING

Coal-tar coating shall be as specified in SECTION 02560 UTILIDOR SYSTEM.

2.13 POLYURETHANE AND POLYISOCYANURATE INSULATION

The manufacture of polyurethane and/or polyisocyanurate shall be based on the reaction of an isocyanurate with a polyol using a fluorocarbon blowing agent to form a rigid closed-cell structured polyurethane foam, or on the reaction of an isocyanurate with itself using a catalyst and a blowing agent to form a rigid closed-cell structured polyisocyanurate foam. The insulation foam shall be homogeneous, of uniform density and self-extinguishing. The insulation shall have the following properties:

Compressive Strength by ASTM D 1621 @74 degrees F	20 psi (min.)
Initial Thermal Conductivity K value @ 75 degrees F	0.014 BTU/(hr.ft. deg F) (max.)

by ASTM C 518

Moisture Absorption 3% by volume (max.)
by ASTM D 2842

2.14 POLYSTYRENE INSULATION

Extruded Polystyrene Pipe Insulation

Compressive Strength 20 psi (min.)
by ASTM D 1621 @74 degrees F

K value @ 75 degrees F
by ASTM C 518 0.259

Moisture Absorption 0.5% by volume (max.)
by ASTM C 272

Expanded Polystyrene Pipe Insulation

Compressive Strength 25 psi (min.)
by ASTM D 1621 @74 degrees F

K value @ 75 degrees F
by ASTM C 518 0.238

Moisture Absorption <2% by volume (max.)
by ASTM C 272

2.15 SERVICE CLAMPS

Service clamps shall have a pressure rating not less than that of the pipe to be connected and shall be either the single or double flattened strap type. Clamps shall have a galvanized malleable iron body with cadmium plated straps and nuts. Clamps shall have rubber gaskets cemented to the body.

2.16 TAPPING SLEEVES

Tapping sleeves of the sizes indicated for connection to existing main shall be the cast gray, ductile, or malleable iron, split-sleeve type with flanged or grooved outlet, and with bolts, follower rings and gaskets on each end of the sleeve. Construction shall be suitable for a maximum working pressure of 150 psi. Bolts shall have square heads and hexagonal nuts. Longitudinal gaskets, and mechanical joints with gaskets shall be as recommended by the manufacturer of the sleeve. When using grooved mechanical tee, it shall consist of an upper housing with full locating collar for rigid positioning which engages a machine-cut hole in the pipe, encasing an elastomeric gasket which conforms to the pipe outside diameter around the hole and a lower housing with positioning lugs, secured together during assembly by nuts and bolts as specified, pretorqued to 50 pound feet. Romac 202N service saddles may be used for 2" or less diameter connections to ductile iron pipe.

2.17 PIPE ALIGNMENT GUIDES

Pipe alignment guide type shall conform to SECTION 02559 HEAT

DISTRIBUTION SYSTEMS IN UTILIDORS AND MANHOLES. Alignment Guides shall not require lubrication. The alignment guide shall not be affected by high humidity or mildly corrosive atmosphere. The guide surfaces shall be protected from accumulation of dirt and other foreign matter.

2.17.1 Insulation Inserts at Pipe Supports and Pipe Carriers

Insulation inserts at pipe supports or carriers shall be a pre-manufactured system consisting of calcium silicate pipe insulation, an ultra-high density insulation insert with a minimum compressive strength of 900 psi, a vapor barrier and jacket to match the adjacent insulation system, and a galvanized steel shield. Insert and metal shield dimensions shall be appropriate for calculated loads.

PART 3 EXECUTION

3.1 INSTALLATION

Piping shall be installed as indicated on the drawings. Piping in manholes is shown in general configuration. Dimensions and lengths may vary slightly depending on pipe and fitting dimensions, location of supports and anchors, and fabrication. It shall be the Contractor's responsibility to insure that the final piping arrangement fits and conforms to the general configuration shown on the drawings. Pipe shall be cut accurately to measurements established at the site by the Contractor and shall be worked into place without springing or forcing. Care shall be taken not to weaken structural portions of the utilidor or manholes. Changes in pipe sizes shall be made with reducing fittings. Use of long screws and bushings will not be permitted. Tapping into existing systems shall be accomplished with as little system down time as possible. The Contractor shall submit his plan of action for tapping into existing systems for each tap.

3.2 HANDLING

Pipe and accessories shall be handled so as to insure delivery to the utilidor in sound, undamaged condition. Particular care shall be taken not to injure the pipe coating or lining. If the coating or lining of any pipe or fitting is damaged, the repair shall be made by the Contractor at his expense in a satisfactory manner. No other pipe or material of any kind shall be placed inside a pipe or fitting after the coating has been applied. Pipe shall be carried into position and not dragged. Use of pinch bars and tongs for aligning or turning pipe will be permitted only on the bare ends of the pipe. The interior of pipe and accessories shall be thoroughly cleaned of foreign matter before being lowered into the utilidor and shall be kept clean during laying operations by plugging or other acceptable method. Before installation, the pipe shall be inspected for defects. Material found to be defective before or after laying shall be replaced with sound material without additional expense to the Government. Rubber gaskets that are not to be installed immediately shall be stored in a cool and dark place. Storage facilities shall be classified and marked in accordance with NFPA 704, with classification as indicated in NFPA 49 and NFPA 325M.

3.3 CUTTING OF PIPE

Cutting of pipe shall be done in a neat and workmanlike manner without damage to the pipe. Unless otherwise recommended by the manufacturer and authorized by the Contracting Officer, cutting shall be done with a

mechanical type cutter. Wheel cutter shall be used when practicable. Squeeze type mechanical cutters shall not be used for ductile iron.

3.4 PIPE SUPPORTS AND HANGERS

Supports shall be designed to prevent the accumulation or provide for the drainage of liquid where water lines and sewer lines are placed on the same support. Pipe inserts and supports shall be an engineered system stamped and signed by a registered professional engineer, in accordance with SECTION 02560, UTILIDOR SYSTEM. The maximum spacing between pipe supports for straight runs shall be as follows unless a lesser amount is recommended by the pipe and/or coupling manufacturer. The Contractor shall submit design calculations showing the adequacy of the pipe support system.

Nominal Pipe Size (Inches)											
	1/2 to 1	1-1/4	1-1/2	2	2-1/2	3	4	6	8	10	12 and over
Max Span (Feet)	7	7	9	10	10	10	10	10	10	20	20

Nominal Tubing Size (Inches)										
	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6 and over
Max Span (Feet)	5	5	6	7	8	8	9	10	10	10

Pipe supports shall be spaced not over 5 feet apart at heavy fittings and valves. Pipe shall be supported near each coupling and at multiple fittings as required. A support shall be installed not over 1 foot from each change in direction of piping. Straight runs of pipe over 15 feet supported on beams or brackets shall be provided with a cylinder type alignment guide with a guide spider attached to the pipe. No hangers or supports shall be suspended from removable manhole tops or removable utilidor lids, except as shown on the drawings. All pipe hangers and supports shall be hot dip galvanized after fabrication to provide a Coating Grade of 65 (average zinc coating of 1.5 ounces/square foot) in accordance with ASTM A 123/A 123M. Supports in utilidors and manholes that rest on the utilidor or manhole bottom shall be protected with two coats of coal-tar coating or equal applied to a minimum of the lower 12 inches of the support. Scratches and chips in the coating acquired during transport or installation shall be re-coated.

3.4.1 Pre-Cast Concrete Block Pipe Support

Concrete blocks shall generally not be used to support pipes within manholes except for sewer pipe over 14 inches. Concrete blocks can be used for support within the fire hydrant utilidor. The pre-cast concrete block pipe supports shall be attached to the floor using structural epoxy adhesive. Apply the adhesive to the full footprint of the block per adhesive manufacturer's instructions. The bonding surfaces must be clean and sound. The surface may be dry or damp, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles, and disintegrated materials. Prepare the utilidor

floor for the adhesive by grinding and pressure washing. If concrete supports are used to support sewer pipe, they must be constructed in such a way that they are vertically adjustable in 1/2 inch increments up to 4 inches in each direction to allow adjustment for settlement.

3.4.2 Pipe Support Racks

Pipe support system shall be an engineered system design stamped and signed by a Registered Professional Engineer (P.E.).

3.5 JOINT DEFLECTION

The maximum allowable deflection will be 15 minutes, unless a lesser amount is recommended by the manufacturer. If the alignment requires deflection in excess of the above limitations, special bends or a sufficient number of shorter lengths of pipe shall be furnished to provide angular deflections within the limit set forth. Under no circumstances shall pipes or fittings be forced into position, with or without heat.

3.6 PLACING AND LAYING

Pipe and accessories shall be carefully lowered into the utilidor by means of derrick, ropes, belt slings, or other authorized equipment. Under no circumstances shall any of the waterline materials be dropped or dumped into the utilidor. Care shall be taken to avoid abrasion of the pipe coating. When work is not in progress, open ends of pipe, fittings, and valves shall be securely closed so that no water, earth or other substance will enter the pipes or fittings. Where any part of the coating or lining is damaged, the repair shall be made by the Contractor at his expense in a satisfactory manner. Pipe ends left for future connections shall be valved, plugged or capped, and anchored, as shown.

3.6.1 Connections

Where connections are made between new work and existing mains, the connections shall be made by using specials and fittings to suit the actual conditions. Standard methods are available for making connections to various types of pipe, either under pressure or in the dewatered
condition. Where made under pressure, these connections shall be installed as required by the Contracting Officer.

3.7 JOINTING

Unrestrained sleeve type couplings shall not be used on fire lines.

3.7.1 Ductile-Iron Pipe

Split sleeve joints shall be installed in accordance with AWWA C606 for cut grooved and shouldered pipe. Mechanical and restrained push-on joints shall be installed in accordance with the applicable portions of AWWA C600.

3.7.2 Steel Pipe, Not Galvanized

3.7.2.1 Mechanical Couplings

Mechanical couplings shall be installed in accordance with the

recommendations of the couplings manufacturer.

3.7.2.2 Rubber Gaskets

Rubber gaskets shall be handled, lubricated where necessary, and installed in accordance with the recommendations of the pipe manufacturer.

3.7.2.3 Welding

Welding shall be in accordance with SECTION 05093 WELDING PRESSURE PIPING.

3.7.3 Galvanized-Steel Pipe

3.7.3.1 Screw Joints

Screw joints shall be made tight with a stiff mixture of graphite and oil, inert filler and oil, or with an equivalent graphite compound, applied with a brush to the male threads only. Compounds shall not contain lead. Unions shall be provided where required for disconnection of piping.

3.7.3.2 Welding

Welding shall be in accordance with SECTION 05093 WELDING PRESSURE PIPING. Exterior welded surface shall be finished with galvanized coating.

3.7.4 Copper Tube

Joints for copper tubing shall be made with soldered or brazed fittings. Tube shall be cut square with burrs removed. Outside surface of the tube where engaged in the fitting, and inside surface of the fitting in contact
with the tube, shall be cleaned with an abrasive material before soldering. Care shall be taken to prevent annealing of tube and fittings when making connections. Solder joints shall be made with flux and wire form or paste-type solder. The flux shall be mildly corrosive liquid or petroleum-based paste containing chlorides of zinc and ammonium. Core solder shall not be used. Joints in copper tube 2-1/2 inches and larger shall be made with heat applied uniformly around the entire circumference of the tube and fittings by a multiflame torch. Joint material shall be 95/5 solder. 95/5 indicates 95 percent tin - 5 percent antimony solder in
accordance with ASTM B 32.

3.7.5 Isolation Joints

Isolation joints shall be installed in accordance with details specified in paragraph ISOLATION JOINTS.

3.7.6 Transition Fittings

Connections between different types of pipe and accessories shall be made with transition fittings as required.

3.8 INSTALLATION OF SERVICE LINES

Services lines shall include the pipeline connecting water distribution lines to the connections with the building service as shown on the drawings. Where building services are not installed, the Contractor shall terminate the service lines inside the appropriate manhole on the main utilidor. Such service lines shall be closed with plugs or caps. Service lines shall be connected to the main by a rigid connection and shall have a gate valve.

3.9 FIELD COATING AND LINING OF PIPE

3.9.1 Pipe 3 Inches and Larger

3.9.1.1 Cement-Mortar Coating and Lining

Field jointing shall conform to Appendix, AWWA C205. Any defective area found in the coating and/or lining of pipe and joints shall be removed to the pipe wall, and the area shall be repaired in a manner such that the repaired areas will be at least equal in thickness to the minimum coating and/or lining required for the pipe. Steel reinforcement in the coating shall be repaired or replaced as necessary to assure a complete and soundly reinforced coating.

3.9.1.2 Galvanized-Steel Pipe

Field joints shall be given one coat of coal-tar primer and two coats of coal-tar enamel conforming to AWWA C203, and any flaws or holidays found in the coating of pipe and joints shall be repaired by patching or other approved means; the repaired areas shall be at least equal in thickness to the minimum coating required for the pipe.

3.10 SETTING OF FIRE HYDRANTS

3.10.1 Fire Hydrants

Fire hydrants shall be located and installed as shown. Each hydrant shall be connected to the main with a 6 inch branch line. This branch shall contain one gate valve. Hydrants shall be set plumb with pumper nozzle facing the roadway and with the center of the lowest outlet not less than 18 inches above the top of concrete lid and the operating nut not more than 48 inches above the top of concrete lid.

3.10.2 Hydrants, After Delivery

Hydrants, after delivery, shall be drained to prevent freezing and shall have the interior cleaned of all foreign matter before installation. Stuffing boxes shall be tightened and the hydrant shall be fully opened and fully closed to insure that all parts are in working condition.

3.11 CHECK VALVES AND VACUUM AND AIR RELIEF VALVES

Check valves and vacuum and air relief valves shall be installed in manholes as shown.

3.12 TEES, CROSSES, AND WYES

Tees, crosses and wyes for future connections shall be installed as shown.

3.13 THRUST RESTRAINT

Plugs, caps, tees and bends on all waterlines 4 inches in diameter or larger, and on fire hydrants, shall be provided with concrete or structural steel thrust blocking, anchors or metal tie rods and clamps or lugs, as shown on the drawings. Valves shall be securely anchored or shall be provided with thrust blocking to prevent movement. Blocking shall be placed between solid surface and the hydrant, valve, or fitting to be anchored. Blocking shall be placed so that the fitting joints will be accessible for repair. The connection between the utilidor water or fire lines and the interior building water or sprinkler piping, and all bends, plugs and tees on fire protection lines, shall be installed and restrained against thrust in accordance with NFPA 24, and as shown on the drawings. Steel rods and clamps shall be protected by coating with asphalt varnish or by galvanized coating.

3.14 EXPANSION JOINTS

Expansion in water lines and fire lines shall be provided by cut grooved pipe type couplings or other pipe joints, which permit 4 inches minimum of pipe movement, except as indicated on the drawings. Expansion Joints shall be designed for a minimum working pressure of 150 psi. Installation shall be per manufacturer's installation instructions. The length of the piping section where the expansion joint is to be installed shall be adjusted for the temperature of the pipe at the time of installation. Flexible type couplings may be used if full expansion is accounted for. The Contractor shall submit a table showing, for each 10 degrees F above and below the design temperature of 70 degrees F, the amount the center-to-end dimension of the joint shall be decreased or increased per each 100 feet of pipe length in the run (joint at mid-length when temperature of pipe section is 55 degrees F).

3.14.1 Bellows Type Joints

Bellows type joints shall not be used with pipe joints or couplings that allow axial movement. Joints shall be packless and flexible with no internal sleeves. Expansion elements shall be of stainless steel. Joints shall be equipped with limit rods to prevent the expansion joint from exceeding the rated travel.

3.14.2 Cut Grooved Pipe Type Coupling Expansion Joints

Joints shall be flexible. Expansion joints shall be combinations of couplings and short nipples, joined in tandem to provide increased expansion. Joints and nipples shall conform to applicable requirements of paragraphs FITTINGS AND SPECIALS. Expansion joints shall be installed as recommended by the manufacturer. Spacing requirements shall conform to SECTION 02559 HEAT DISTRIBUTION SYSTEMS IN UTILIDORS AND MANHOLES (See paragraph EXPANSION JOINTS) except that manufacturer requirements govern when using flexible pipe systems.

3.14.3 Restrained Push-On Joints

Flexible joints shall be installed as recommended by the pipe manufacturer to allow for axial movement within the joint due to thermal expansion and contraction.

3.15 ALIGNMENT GUIDES

3.15.1 General

Alignment Guides shall be cast-iron or steel and shall be so constructed that the axial movement of the pipe caused by thermal expansion will be guided in a straight line only and movement in any other direction will be adequately restrained. Pipe alignment guides shall be the cylinder type with a guide spider attached to the pipe. Pipe alignment guides using a slide plate shall not be acceptable. The anchor base shall be correctly designed, adequately supported, and properly aligned to prevent distortion and binding of the pipe in the guide. The upper half of the guiding cylinder must be removable. All types must be designed for a pipe movement of not less than 8 inches. Guides shall be securely anchored against pipe movement. In no case will pipe rollers, racks, or hangers be considered substitutes for guides. Alignment guides that are supported from the floor of manholes or utilidors shall have the bottom 12 inches protected with two coats of coal-tar coating.

3.16 ANCHORS

Pipe anchors in manholes and utilidors shall be of welded construction, designed by the Contractor and submitted for written approval to the Contracting Officer. Shop drawings indicating anchor locations and details of design, including calculations, shall be submitted for Government Approval. Shop drawing approval shall be received prior to placing any piping. The range of anticipated pipe temperatures, which shall be used to determine the design forces on waterline anchors, is from 10 degrees F to 100 degrees F. Pressures for calculating forces are as follows: Working Pressure of 150 psi and a test pressure of 200 psi. If expansion anchors are used in lieu of cast in place anchor bolts, an additional safety factor of 1.5 shall be used in sizing the anchor bolts. No supports, anchors, or stays shall be attached in places where they will injure the construction whether in installing or by the weight or expansion of the pipe. Coordination of all aspects of anchor placement shall be the Contractor's responsibility. All steel shapes shall conform to ASTM A 36/A 36M. Bolts and nuts shall conform to ASTM A 307 and ASTM A 563, as applicable. The type and class shall be the Contractor's option. For finishing, see SECTION 02560 UTILID0R SYSTEM, paragraph PAINTING AND FINISHING. Additionally, any anchor that is supported from the manhole or utilidor bottom shall have the lower 6 inches of the anchor protected with two layers of coal-tar coating. Anchors shall be attached to pipes by welding.

3.17 INSULATION

3.17.1 General Requirements

Cold water lines, including valves and fittings, throughout utilidors shall be covered with insulation. As a part of the installation, the insulation shall have the joints buttered with mastic in such a manner as to fill all insulation joints and to prevent any future passage of vapor to the cold water pipe after the assembly is complete. Special care shall be exercised to insure that joint sealer material does not drip on the utilidor floor or become smeared on the outer surface of the insulation or adjacent piping. The insulation shall be adequately secured to the pipe with 3/4-inch lacquered steel or other rust-resistant type bands, placed not over 12 inches on centers. Protection sleeves shall be provided at each support to protect the insulation. Sleeves shall be made up from a 12 inch wide strip of 20 gauge galvanized sheet metal cut to provide a one inch minimum overlap. Sleeves shall be secured to the insulation by 2 bands located

approximately 1-1/2 inches from each end of the sleeve. Bands shall be the same type as used to secure insulation to pipe.

3.17.2 Insulation

Pipe insulation shall be extruded polystyrene, expanded polystyrene, polyurethane foam or closed cell polyisocyanurate foam.

Insulation shall be at least 1 inch thick. Application shall be as described in General Requirements except that a positive vapor barrier shall be provided on the outside surface of all insulation, except for elastomer foam rubber insulation, including that protected by an aluminum jacket. Joints or fittings requiring routing out of more than 1/4 inch of insulation to secure proper insulation fit shall be covered with oversize insulation of sufficient thickness to obtain a minimum thickness of 1 inch.

3.17.3 Aluminum-Jacket

Aluminum-jacket shall be provided over insulation on cold water lines in the manholes and to a distance of 5 feet into the new utilidors including valves and fittings. Aluminum-jacket material shall be of the best grade suitable for service. Aluminum-jackets shall be not less than 0.016-inch thick and shall be secured with aluminum bands not less than 3/8-inch wide and not more than 8 inches apart. Jacket sections shall have 1 inch hem turned along one longitudinal edge and shall be applied with the hemmed edge over the unhemmed edge. The longitudinal and circumferential seams shall be lapped not less than 2 inches. Jackets on horizontal lines shall be installed so that the longitudinal seams are on the bottom side of the pipe with the seam of each jacket slightly offset from the seam of the adjacent jackets. The seams of jackets installed on vertical lines shall be slightly offset as on horizontal lines. The jackets on vertical lines and lines pitched from the horizontal shall be installed from low point to high point so that the lower circumferential edge of each jacket overlaps the jacket below it. Special fitting jackets conforming to the above, with the exception of longitudinal lapping dimensions and location of seams, may be used for fittings, valves, and flanges. Jackets for fittings, valves, and flanges shall be properly overlapped and secured. Under no conditions shall the jacketing be allowed to become electrically coupled to the piping or be installed vapor tight.

3.17.4 Nonmetallic Jacket

Nonmetallic jackets shall be of the AWJ (All Weather Jacket) type. Nonmetallic jacket shall consist of a 0.042 pounds per square foot fiberglass fabric impregnated with chlorosulfonated polyethylene (Hypalon)
and a 0.0015-inch (1.5 mils) polyvinyl fluoride film (Tedlar) bonded to it. Overall thickness of the composite shall be 0.01 inch and weigh approximately 0.073 pounds per square foot. Jacket may be either field or factory applied to the insulation.

3.18 HYDROSTATIC TESTS

Where any section of a water line is provided with concrete thrust blocking for fittings or hydrants, the hydrostatic tests shall not be made until at least 5 days after installation of the concrete thrust blocking unless otherwise approved. The method proposed for disposal of

waste water from hydrostatic tests and disinfection shall be submitted to the Contracting Officer prior to performing hydrostatic tests. Contractor is responsible to meet ADEC requirements and to obtain permits for water discharge during hydrostatic testing and disinfection.

3.18.1 Hydrostatic Test

After the pipe is laid, the joints completed, and the fire hydrants permanently installed, the newly laid piping or any valved section of water distribution, or water service piping, or fire line shall, unless otherwise specified, be subjected for 2 hours to a hydrostatic pressure test of 200 psi. Each valve shall be opened and closed several times during the test. Exposed pipe, joints, fittings, valves and hydrants shall be carefully examined during the test. No leakage will be allowed. Joints showing visible leakage shall be replaced or remade as necessary. Cracked or defective pipe, joints, fittings, valves, or hydrants discovered in consequence of this pressure test shall be removed and replaced with sound material, and the test shall be repeated until the test results are satisfactory.

3.18.2 Time for Making Test

Except for joint material setting or where concrete thrust blocking necessitates a 5-day delay, pipelines may be subjected to hydrostatic pressure, inspected, and tested at any time after the line is secured. Cement-mortar lined pipe may be filled with water as recommended by the manufacturer before being subjected to the hydrostatic test.

3.18.3 Concurrent Hydrostatic Tests

The Contractor may elect to conduct the hydrostatic tests using the following procedures. Regardless of the sequence of tests employed, the results of hydrostatic tests and disinfection shall be satisfactory as specified. All replacement, repair or retesting required shall be accomplished by the Contractor at no additional cost to the Government.

3.18.3.1 Hydrostatic Tests and Disinfection

Hydrostatic tests and disinfection may be conducted concurrently, using the water treated for disinfection to accomplish the hydrostatic tests. If water is lost when treated for disinfection and air is admitted to the unit being tested, or if any repair procedure results in contamination of the unit, disinfection shall be reaccomplished.

3.19 DISINFECTI0N

Before acceptance of potable water operation, each unit of completed water
and fire line shall be disinfected as prescribed by AWWA C651. Disinfection shall be repeated until tests indicate the absence of pollution for at least 2 full days. The unit will not be accepted until satisfactory results have been obtained from water samples submitted by the Contractor to a laboratory certified by the State of Alaska to perform
testing for coliform bacteria.

3.20 CLEANUP

Upon completion of the installation of the water distribution lines and

water service lines, fire lines, and appurtenances, all debris and surplus materials resulting from the work shall be removed.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02533

SEWERS IN UTILIDORS

PART 1 GENERAL

1.1 REFERENCES
1.2 GENERAL
1.3 SUBMITTALS
1.4 SUBMITTALS SUPPLEMENT
1.4.1 Materials
1.4.2 Calculation of Pipe Supports
1.4.3 Calculation of Pipe Anchors
1.4.4 Hydrostatic tests
1.4.5 Manufacturer's Recommendations

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT
2.1.1 Pipe
2.1.2 Combination Sewage Air Valves
2.1.3 Expansion Joints
2.1.3.1 Cut Grooved Pipe Type Coupling Expansion Joints
2.1.4 Quick Disconnect Couplings
2.1.5 Clean Out Cap
2.1.6 Pipe Clamp Restraining System
2.1.7 Valves
2.1.8 Portland Cement Grout
2.1.9 Pipe Water Stop

PART 3 EXECUTION

3.1 INSTALLATION REQUIREMENTS

-- End of Section Table of Contents --

SECTION 02533

SEWERS IN UTILIDORS

PART 1 GENERAL

1.1 REFERENCES

The publication listed below form a part of this specification to the extent referenced. The publication are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI B18.2.1	(1996) Square and Hex Bolts and Screws Inch Series

ASTM INTERNATIONAL (ASTM)

ASTM A 123	(2000) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 126	(1995; R 2001) Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A 351/A 351M	(2000) Castings, Austenitic, Austenitic-Ferritic (Duplex), for Pressure-Containing Parts
ASTM A 536	(1994; 1999e1) Ductile Iron Castings
ASTM B 584	(2000a) Copper Alloy Sand Castings for General Applications
ASTM D 2000	(2000) Rubber Products in Automotive Applications

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C111	(2000) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

STATE OF ALASKA ADMINISTRATIVE CODE (AAC)

18 AAC 72	(2003) Wastewater Treatment and Disposal

1.2 GENERAL

This section covers sewage lines, both gravity and force mains.

Recommendations of the Manufacturer: The Contractor shall, as a part of the shop drawings, submit to the Contracting Officer the manufacturer's recommendations for each material or procedure to be utilized which is required to be in accordance with such recommendations. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions

unless otherwise directed by the Contracting Officer.

The Contractor shall obtain the construction certification as required by the Alaska Department of Environmental Conservation (ADEC) under 18 AAC 72.235. The Contractor's construction certification works shall include the record drawings, the observing engineer, and signing the certificate of construction form.

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

Materials

Calculation of Pipe Supports

Calculation of Pipe Anchors; G

Pipe Support System Descriptive Data; G

SD-06 Test Reports

Hydrostatic tests

SD-08 Manufacturer's Instructions

Manufacturer's procedures

1.4 SUBMITTALS SUPPLEMENT

See paragraphs below for further descriptions of submittals required by paragraph SUBMITTALS:

1.4.1 Materials

Manufacturer's descriptive data, catalog cuts, and brochures for each type and size of the following:

a. Couplings and gaskets

b. Combination sewage air valve

c. Pipe

1.4.2 Calculation of Pipe Supports

Calculation of pipe supports shall be submitted with pipe support system descriptive data, see submittal in SECTION 02560 UTILIDOR SYSTEM. Sewer pipe supports must be designed so that the elevation of the pipe can be adjusted at each support point to compensate for seismic movement and settling in the future. Pipes 10 inches and larger must be restrained at pipe supports with a two inch wide stainless steel strap to prevent the pipe from floating in a high water event in the utilidor.

1.4.3 Calculation of Pipe Anchors

Calculation of pipe anchors shall be submitted with anchor sizes and drawings showing location and details of anchor. At a minimum anchors shall be placed near the locations shown on the drawings, see SECTION 02560 UTILIDOR SYSTEM.

1.4.4 Hydrostatic tests

Submit a hydrostatic test procedure describing method including method proposed for disposal of wastewater, see SECTION 02560 UTILIDOR SYSTEM.

1.4.5 Manufacturer's Recommendations

Manufacturer's recommendations for each material or procedure to be utilized which is required to be in accordance with such recommendations. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions unless otherwise directed by the Contracting Officer.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

Products shall be in accordance with the applicable provisions of PART 2 - PRODUCTS of SECTION 02511 WATER DISTRIBUTION SYSTEMS IN UTILIDORS except as modified herein.

2.1.1 Pipe

Pipe 4 inches and larger shall be ductile iron pipe as specified in SECTION 02511 WATER DISTRIBUTION SYSTEMS IN UTILIDORS. Sewer pipe less than 4 inches shall be Schedule 40 galvanized steel pipe as specified in SECTION 02511 WATER DISTRIBUTION SYSTEMS IN UTILIDORS. Pipe for sewer force main shall have a working pressure of 150 psi. Pipe for the gravity sewer line shall have a working pressure of 50 psi.

2.1.2 Combination Sewage Air Valves

The combination sewage air valves shall consist of one sewage air release valve and one sewage air and vacuum valve. The air valve shall be installed at the highest point of the main sewer line. Valves shall be piped into a compact assembly and not exceed 32 inches in height including piping and backwash accessories. Valves shall be vented to the atmosphere.

a. The sewage air release valve shall be of the type that automatically releases air, gas or vapor under pressure during system operation. The valve shall have a maximum working pressure of 150 psi. The orifice button shall insure positive seating. The valve body and cover shall be constructed of ASTM A 126 Class B cast iron. The float, plug, guide shafts, and bushings shall be constructed of Type 304 stainless steel. Non-metallic guides and bushings are not acceptable. Resilient seats shall be Buna-N. Optional body materials include ASTM A 536 Grade 65-45-12 ductile iron, ASTM A 351/A 351M Grade CF8M stainless steel, and ASTM B 584 Alloy 836 cast bronze. The sewage air and vacuum valve shall be of the type that

automatically exhausts large quantities of air during the filling of a system and allows air to re-enter during draining or when a vacuum occurs. The valve shall have an inlet size of 2 inch diameter and a discharge size of 1 inch diameter. Valve shall be constructed of cast iron body and cover, stainless steel float, and bronze or stainless steel trim and internal parts.

b. Backwash accessories shall be furnished and assembled to the valves, consisting of two inlet shut-off valves, two blow-off valves, two clear water inlet valves, 10 feet minimum of rubber hose and quick disconnect couplings. Backwash accessories must be of the type recommended by the air valve manufacturer for use with the air valve. Isolate air valve from the sewer system before backwashing commences. Manufacturer's procedures for backwashing and isolating water and sewer sources connected to the valve must be provided and followed to insure no cross contamination.

c. The combination sewage air valves shall be Model Series ABW as manufactured by Valmatic Valve and Manufacturing Corp. of Lyons, Illinois, or approved equal.

2.1.3 Expansion Joints

Expansion joints in sewer force mains shall be cut grooved pipe type couplings permitting 2 inches minimum of pipe movement, or movement as noted on the drawings if larger than 2 inches. Expansion joints shall be designed for a minimum working pressure of 150 psi. Installation shall be per manufacturer's installation instructions. The length of the piping section where the expansion joint is to be installed shall be adjusted for the temperature of the pipe at the time of installation. Flexible type couplings may be used if full expansion is accounted for. The Contractor shall submit a table showing, for each 10 degrees F above or below the design temperature of 70 degrees F, the amount the center-to-end dimension of the joint shall be decreased or increased per each 100 feet of pipe length in the run (joint at mid-length when temperature of pipe section is 55 degrees F).

2.1.3.1 Cut Grooved Pipe Type Coupling Expansion Joints

Joints shall be flexible. Expansion joints shall be combinations of couplings and short nipples, joined in tandem to provide increased expansion. Joints and nipples shall conform to the applicable provisions of SECTION 02511 WATER DISTRIBUTION SYSTEMS IN UTILIDORS. Expansion joints shall be installed as recommended by the manufacturer.

2.1.4 Quick Disconnect Couplings

Cleanout caps shall be secured in place with quick disconnect couplings. Couplings shall be split ring type with hinged, single unit housing assembly and quick disconnect toggle housing assembly, Victaulic Style 60, Victaulic Style 31 or equal.

2.1.5 Clean Out Cap

Caps for the sanitary sewer clean outs shall be grooved ductile or gray cast iron disks. The caps shall be manufactured to mate with the quick disconnect couplings. At flanged fitting cleanouts use a flange adapter nipple. Cap: Victaulic part no. 60 or equal. Flanged Adapter Nipple: Victaulic part no. 41 or equal.

2.1.6 Pipe Clamp Restraining System

The pipe restraining system shall consist of pipe clamps, clamping bolts and nuts, restraining rods, T-bolts, and nuts. The clamps shall be cast from ductile iron meeting or exceeding ASTM A 536, Grade 65-45-12. The clamping bolts shall meet ANSI B18.2.1 and the rods, T-bolts, and nuts shall be high strength low alloy steel per AWWA C111. Hot dip galvanize all parts per ASTM A 123. Romac Industries Series 600 pipe restraining system or equal.

2.1.7 Valves

The force main gate valve and the sump gate valves shall use the same valves as specified in SECTION 02511 WATER DISTRIBUTION SYSTEMS IN UTILIDORS for their respective pipe material and diameter.

2.1.8 Portland Cement Grout

Non-Shrink Portland cement grout shall be fast setting grout. Sika Set Plug, Sika Corporation or equal.

2.1.9 Pipe Water Stop

The water stop on sanitary sewer pipe penetration at concrete walls shall be modular, mechanical type, consisting of inter-locking synthetic rubber links shaped to continuously fill the annular space between the pipe and the wall opening. The elastomeric element shall meet ASTM D 2000 M# BA510. Link Seal by Thunderline Corporation or equal.

PART 3 EXECUTION

3.1 INSTALLATION REQUIREMENTS

Execution shall be in accordance with the applicable provisions of PART 3 - EXECUTION of SECTION 02511 WATER DISTRIBUTION SYSTEMS IN UTILIDORS, except as modified herein.

a. The sewer lines shall not be disinfected.

b. The sewer lines shall not be insulated.

c. The sewer line shall have a hydrostatic pressure test of 50 psi for gravity lines and 200 psi for pressure lines.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02552

PRE-ENGINEERED UNDERGROUND HEAT DISTRIBUTION SYSTEM

PART 1 GENERAL

1.1 REFERENCES
1.2 DEFINITIONS
1.2.1 Pre-engineered System
1.2.2 Direct-Buried
1.2.3 UHDS Types
1.2.3.1 Drainable-Dryable-Testable (DDT) Direct-Buried System
1.2.3.2 Water Spread Limiting (WSL) Direct-Buried System
1.2.4 UHDS Manufacturer
1.2.5 UHDS Manufacturer's Representative
1.2.6 Corrosion Engineer
1.3 WORK DESCRIPTION
1.3.1 Scope
1.3.2 UHDS Design
1.3.3 Contract drawings
1.4 SYSTEM REQUIREMENTS
1.4.1 Cathodic Protection
1.4.2 Operating Characteristics
1.5 STANDARD PRODUCTS
1.6 SUBMITTALS
1.7 SITE CLASSIFICATION

PART 2 PRODUCTS

2.1 FACTORY FABRICATED, DIRECT-BURIED DDT SYSTEMS
2.1.1 DDT Steam Carrier Pipes
2.1.2 DDT Condensate Carrier Pipes
2.1.3 DDT Carrier Pipe Insulation
2.1.4 Insulation Banding and Scrim
2.1.5 Casing
2.1.6 Casing End Plates, Vents, and Drains
2.1.7 Air Space
2.1.8 Casing Coating
2.1.8.1 Fusion-Bonded Epoxy
2.1.8.2 Urethane Elastomer
2.1.9 Coating of End Plates and Conduit Extending into Manholes
2.1.10 Carrier Pipe Guides
2.1.11 Anchor Plates
2.1.12 Field Connection of Casing Sections
2.1.13 Manufacturer's Identification
2.2 PIPE INSULATION TYPE AND MINIMUM THICKNESS
2.3 HEAT DISTRIBUTION PIPING
2.3.1 Steam and High Temperature Hot Water Pipe
2.3.1.1 Condensate Pipe
2.3.1.2 Joints
2.3.2 Fittings
2.3.2.1 Butt-Welded

2.3.2.2 Socket-Welded

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS
3.1.1 Work Plan
3.1.2 Quality Assurance Plan
3.1.3 Grading
3.1.4 Connecting to Existing Work
3.1.5 Coordination
3.1.6 Variations
3.1.7 Storage and Handling During Installation
3.2 DEMOLITION
3.2.1 Demolition Procedures
3.2.2 Asbestos Removal
3.3 PIPE, PIPING JOINTS AND FITTINGS
3.3.1 Joint Preparation
3.3.2 Direction Changes
3.4 WELDING
3.5 HEAT DISTRIBUTION SYSTEM INSTALLATION
3.5.1 Verification of Final Elevations
3.5.2 Excavation, Trenching, and Backfilling
3.5.3 UHDS Manufacturer's Representative Responsibilities
3.5.4 UHDS Manufacturer's Representative Reports
3.5.5 Protection
3.5.6 Defective Material
3.5.7 Cathodic Protection Installation
3.6 TESTS
3.6.1 Holiday Testing of Direct-buried System Steel Casings
3.6.2 Pneumatic, Hydrostatic and Operational Tests
3.6.2.1 Pneumatic Test
3.6.2.2 Hydrostatic Test
3.6.2.3 Operational Test
3.6.3 Deficiencies
3.7 VALVE MANHOLES
3.8 BURIED UTILITY WARNING AND IDENTIFICATION
3.8.1 Plastic Marking Tape

-- End of Section Table of Contents --

SECTION 02552

PRE-ENGINEERED UNDERGROUND HEAT DISTRIBUTION SYSTEM

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 300	(2000) Inorganic Zinc Rich Primer

ASTM INTERNATIONAL (ASTM)

ASTM A 36/A 36M	(2000a) Carbon Structural Steel
ASTM A 53/A 53M	(1999b) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A 106	(1999el) Seamless Carbon Steel Pipe for High-Temperature Service
ASTM A 134	(1996) Pipe, Steel, Electric-Fusion (Arc)-Welded (Sizes NPS 16 and over)
ASTM A 135	(1997c) Electric-Resistance-Welded Steel Pipe
ASTM A 139	(2000) Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and over)
ASTM A 167	(1999) Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A 234/A 234M	(2000) Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
ASTM D 2487	(2000) Classification of Soils for Engineering Purposes (Unified Soil Classification System)

ASME INTERNATIONAL (ASME)

ASME B16.9	(1993) Factory-Made Wrought Steel Buttwelding Fittings
ASME B16.11	(1996) Forged Fittings, Socket-Welding and Threaded

ASME B31.1	(1998) Power Piping
ASME B40.1	(1991) Gauges - Pressure Indicating Dial Type - Elastic Element

1.2 DEFINITIONS

The following definitions shall apply to the work.

1.2.1 Pre-engineered System

A complete underground heat distribution and condensate return system including all required components such as carrier pipes, steam pipe, condensate return pipe, and fittings, anchors, pipe supports, insulation, protective casing, and cathodic protection, for the system supplied. The pre-engineered system does not include valve manholes and the piping and equipment inside the valve manholes; The pre-engineered system shall include all piping and components to a point at least 6 inches inside the building and valve manhole walls. The UHDS shall not use any part of the building or valve manhole structure as an anchor point.

1.2.2 Direct-Buried

A system which is buried, without the need for a field-fabricated protective enclosure such as a concrete trench or tunnel.

1.2.3 UHDS Types

1.2.3.1 Drainable-Dryable-Testable (DDT) Direct-Buried System

A factory-fabricated system including an air and water-tight outer protective casing, air space and an insulated carrier pipe. Drains and vents are provided at the end plates of the system (in manholes or buildings). The drains are normally capped but the caps can be removed to drain water which may leak into the air space if there is a failure in the casing or the carrier pipe. The vents allow water vapor to escape and provide a tell-tale sign of leakage.

1.2.3.2 Water Spread Limiting (WSL) Direct-Buried System

A factory fabricated system including an outer protective casing and an insulated carrier pipe. The system is fabricated in sections which are independent from each other; ground water or condensate which leaks from or into one section cannot travel into the next section. Field-assembly of the sections requires no welding as the sections push together and are sealed with a system of couplings and seals.

1.2.4 UHDS Manufacturer

The UHDS manufacturer is the company responsible for the design and manufacture of the pre-engineered system. The UHDS manufacturer directs the installation of the system and has a representative on the jobsite.

1.2.5 UHDS Manufacturer's Representative

The UHDS manufacturer's representative shall be a person who regularly performs the duties specified is certified in writing by the UHDS

manufacturer to be technically qualified and experienced in the installation of the system, and shall be authorized by the manufacturer to make and sign the daily reports specified. The UHDS manufacturer's representative shall be under the direct employ and supervision of the UHDS manufacturer.

1.2.6 Corrosion Engineer

Corrosion engineer refers to a person who by knowledge of the physical sciences and the principles of engineering and mathematics, acquired by professional education and related practical experience, is qualified to engage in the practice of corrosion control. Such person may be a licensed professional corrosion engineer or certified as being qualified by the National Association of Corrosion Engineers (NACE), if such licensing or certification includes 3 years experience in corrosion control on underground metallic surfaces of the type under this contract. NACE certification shall be technologist, corrosion specialist, or cathodic protection specialist. The corrosion engineer shall make at least 3 visits to the project site. The first of these visits shall include obtaining soil resistivity data, acknowledging the type of pipeline coatings to be used and reporting to the Contractor the type of cathodic protection required. Once the submittals are approved and the materials delivered, the corrosion engineer shall revisit the site to ensure the Contractor understands installation practices and laying out the components. The third visit shall involve testing the installed cathodic protection systems and training applicable personnel on proper maintenance techniques. The corrosion engineer shall supervise, inspect, and test the installation and performance of the cathodic protection system.

1.3 WORK DESCRIPTION

1.3.1 Scope

The work shall include the design and fabrication; furnishing; installing, and testing of a direct buried underground insulated heat-distribution system and insulated steel condensate return pipe, consisting of piping as indicated, cathodic protection system (where required by this specification), together with fittings and appurtenances necessary for a complete and operable system. Gland type end seals will not be permitted. DDT systems with fiberglass casings shall not be provided.

1.3.2 UHDS Design

The UHDS manufacturer shall be responsible for the complete design of the UHDS, the product to be supplied, fabrication, witnessing installation and testing of the system within the design parameters established by the contract drawings and specifications, and in compliance with the detailed design. The complete design of the UHDS shall be sealed by a Professional Engineer in the employ of the UHDS manufacturer.

1.3.3 Contract drawings

The contract drawings accompanying this specification provide information on:

a. The size of carrier pipes, approximate length, and site location

of the system.

b. The routing and elevation of the piping along the route.

c. Location and design of manholes.

d. The obstacles that must be avoided along the path.

e. Location of piping anchors (anchors will be no closer than 3 feet or further than 5 feet from entrance to manholes or buildings) at manholes and/or buildings. The UHDS manufacturer shall incorporate anchors as needed for the system.

f. Operating pressure and temperature of system.

1.4 SYSTEM REQUIREMENTS

1.4.1 Cathodic Protection

Cathodic protection shall be provided for systems with coated steel casings in accordance with paragraph Cathodic Protection Installation.

1.4.2 Operating Characteristics

The steam supply system shall have an operating temperature of 390 to 500 degrees F and an operating pressure of 85 psig. condensate return system shall have an operating temperature of 200 to 325 degrees F and an operating pressure of 20 psig.

1.5 STANDARD PRODUCTS

The designed system and equipment provided for this project shall be of current production and shall essentially duplicate systems that have been in satisfactory use for at least 5 years prior to bid opening at 3 locations. The systems shall have been operated under pressure, temperature and site characteristics that are equal to or more severe than the operating conditions in this specification and shall have distributed the same medium. The system shall be supported by a service organization that can reach the site after a service call within 24 hours.

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Heat Distribution System; G.

A complete description of the design and assembly of the system, materials of construction and field installation instructions, not later than 21 days prior to the start of field measurements. Submittal shall also include sufficient system details to show that the specified minimum insulation thickness has been met. A detailed design layout of the system (plan and elevation views)

showing size, type, elevations and location of each component to be used in the system, the design and location of anchors, pipe guides, pipe supports, expansion loops, Z-bends, L-bends, end seals, leak plates, joint locations, pipe and insulation thickness and sizes, types, and movements, connection to manhole and building wall penetrations, and including, if applicable, details of transition point to aboveground or other type systems. Also, if applicable, type and details of the cathodic protection system to be used. Detailed design layout drawings shall be stamped by a registered Professional Engineer.

SD-03 Product Data

Cathodic Protection Installation; G.

Design life calculations for the cathodic protection system, not later than 30 days after notice to proceed. Calculations shall be stamped by an NACE qualified corrosion engineer.

Operational Test; G.

Schedule of testing, 14 days in advance.

Work Plan; G.

Quality Assurance Plan.

Tests; G.

A proposed test procedure and proposed samples of test data sheets for each required test, 30 days prior to the proposed test date. The procedure shall contain a complete description of the proposed test with calibration curves or test results furnished by an independent testing laboratory of each instrument, meter, gauge, and thermometer to be used in the tests. The test shall not commence until the procedure has been approved.

UHDS Manufacturer's Representative Reports.

A daily written report from the representative of the UHDS manufacturer, whenever the representative is required to be on the jobsite.

Connecting to Existing Work; G.

Changes required to the UHDS design due to interferences or conflicts, upon realization of interferences or conflicts.

UHDS Manufacturer; G.

Certification stating that the UHDS manufacturer regularly and currently manufactures direct-buried systems, and that the designs of the system and equipment to be provided for this project conform to specification requirements. This certification shall be an original signed by a principal officer of the UHDS manufacturer and shall be submitted at least 2 weeks prior to the start of work.

UHDS Manufacturer's Representative; G.

A letter from the system manufacturer, at least 2 weeks prior to the start of work, listing the experience and training of the manufacturer's representative.

UHDS Design; G.

A Certificate of Satisfactory Operation certifying that at least 3 systems installed by the UHDS manufacturer within the previous 5 years are operating satisfactorily, not later than 30 days after notice to proceed. The certificate shall indicate the location, type of system, size of system, point of contact (POC) including phone number, for information verification. This certificate of satisfactory operation shall be an original signed by a principal officer of the UHDS manufacturer.

Certificate of Compliance; G.

Upon completion of the work, and before final acceptance, a notarized statement signed by a principal officer of both the UHDS manufacturer and the Contractor, certifying that the system has been installed satisfactorily and in accordance with the contract drawings, specifications, UHDS manufacturer's detailed design layout drawings and with the UHDS manufacturer's recommendations.

SD-10 Operation and Maintenance Data

Heat Distribution System; G.

Operation and maintenance manual listing routine maintenance procedures, possible breakdowns and repairs, procedures for recording conduit temperatures biannually, and troubleshooting guides, before completion of work. Manual shall include as-built piping layout of the system including final elevations.

1.7 SITE CLASSIFICATION

Classification of the site conditions for the UHDS shall be based on ASTM D 2487 and the following criteria: MODERATE.

PART 2 PRODUCTS

2.1 FACTORY FABRICATED, DIRECT-BURIED DDT SYSTEMS

2.1.1 DDT Steam Carrier Pipes

Requirements shall be in accordance with paragraph HEAT DISTRIBUTION PIPING.

2.1.2 DDT Condensate Carrier Pipes

Carrier piping for condensate return systems shall be steel, schedule 80. Pipe requirements shall be in accordance with paragraph HEAT DISTRIBUTION PIPING. Condensate carrier pipes shall not be located in conduit casings which contain steam pipes or any other piping unless otherwise indicated on the drawings.

2.1.3 DDT Carrier Pipe Insulation

Carrier pipe insulation shall conform to minimum thicknesses and type listed in Tables 1 and 2 as required for temperature specified under paragraph Rated Characteristics.

2.1.4 Insulation Banding and Scrim

Stainless steel bands and clips at least 1/2 inch wide, conforming to ASTM A 167 (304 stainless steel), at a maximum spacing of 18 inches shall be used over the scrim to secure the insulation onto the carrier pipe; a minimum of 2 bands shall be used for each 4 foot section of insulation. Scrim shall be vinyl-coated fiberglass with 18 x 16 mesh (number of filaments per inch) and made of 0.013 inch diameter vinyl-coated fibrous glass yarn.

2.1.5 Casing

Casing shall be smooth-wall steel, electric resistance spiral welded, conforming to ASTM A 134, ASTM A 135 or ASTM A 139 and the values tabulated below. Eccentric connectors shall be provided between casing sections as needed to provide drainage of casing section between manholes and between manholes and buildings.

Casing Diameter (in)	Minimum Thickness (in)
6 - 26	0.250
27 - 36	0.250
37 - 42	0.250
46	0.250

2.1.6 Casing End Plates, Vents, and Drains

End plates shall be made of ASTM A 36/A 36M steel, minimum thickness 1/2 inch for conduit pipe sizes above 12 inches and 0.375 inches for conduit pipe sizes 12 inches and less. A 1 inch ASTM A 53/A 53M, Sch 40, galvanized vent riser pipe shall be provided on end plate vent opening. Vent pipe shall extend to top of manhole and terminate 12 inches above grade with a 180 degree bend. A 1 inch drain shall be provided at the bottom and vent at the top. Brass plugs and half coupling, constructed with welded steel and welded to the end plate, shall be furnished; drains shall be plugged; vents shall not be plugged.

2.1.7 Air Space

Continuous 1 inch minimum air space shall be provided between carrier pipe insulation and casing.

2.1.8 Casing Coating

Coating shall be rated by manufacturer for continuous service for at least 25 years at temperatures of 230 degrees F. Coating shall be applied in accordance with the coating manufacturer's instructions, shall be factory inspected for holidays and repaired as necessary.

2.1.8.1 Fusion-Bonded Epoxy

Casing coating shall be fusion-bonded epoxy, minimum thickness 0.04

inches.

2.1.8.2 Urethane Elastomer

Coating shall be urethane elastomer, minimum thickness 0.04 inches.

2.1.9 Coating of End Plates and Conduit Extending into Manholes

End plates and conduit extending into manholes shall be coated with a zinc-rich coating conforming to AASHTO M 300 Type IA, except that volatile organic compounds shall not exceed 2.8 pounds/gallon. The zinc-rich coating shall be applied in accordance with the coating manufacturer's requirements including surface preparation. No additional top coat shall be applied.

2.1.10 Carrier Pipe Guides

Carrier pipe guides shall be spaced 10 feet on centers maximum, no more than 5 feet from pipe ends, with a minimum of 3 guides per elbow section. Guides shall be designed to allow thermal expansion without damage, to provide proper pipe guiding, and to allow horizontal movement in 2 directions as required at expansion loops and bends. Design of supports shall permit flow of water through the support. Pipe insulation shall extend through the pipe guides and be protected by steel sleeves. Design of guides shall negate metal-to-metal contact between the casing and the carrier pipe. Insulation or non-metallic material used to ensure no metal-to-metal contact shall not be compressed by the weight of the carrier pipe when full of water.

2.1.11 Anchor Plates

Anchor plate shall be ASTM A 36/A 36M steel, welded to carrier pipe and casing, 1/2 inch minimum thickness, with passages for air flow and water drainage thru the annular air space in the system. Exterior surface of the anchor plate shall be coated with the same coating material as the casing.

2.1.12 Field Connection of Casing Sections

Field connection of casing shall be made using a compatible steel section, welded to casing sections, coated on all surfaces with UHDS manufacturer's coating field repair compound, and covered with a 0.05 inch minimum thickness polyethylene shrink sleeve designed for a service temperature exceeding 176 degrees F.

2.1.13 Manufacturer's Identification

Embossed brass or stainless steel tag, hung by brass or stainless steel chain at each end of each conduit or insulated piping in the manholes and buildings, shall be provided. The tag shall identify UHDS manufacturer's name, date of installation, Government contract, and manufacturer's project number.

2.2 PIPE INSULATION TYPE AND MINIMUM THICKNESS

Materials containing asbestos will not be permitted. The minimum thickness of insulation for the heat distribution system shall be in accordance with Tables 1 and 2 in which the insulations listed have

passed the 96 hour boiling water test.

TABLE 1

Minimum Pipe Insulation Thickness (inches)

For steam piping 16 psig to 250 psig and high temperature hot water supply and return piping up to 450 degrees F

Nominal Pipe Diameter (in.)	Insulation Thermal Conductivity (k) k less than 0.29	k from 0.29 to 0.40	k greater than 0.40
1.0	1.0	1.0	1.0
1.5	1.0	1.0	1.0
2.0	1.0	1.0	1.5
2.5	1.0	1.0	1.5
3.0	1.0	1.5	1.5
4.0	1.0	1.5	1.5
5.0	1.5	1.5	2.0
6.0	1.5	2.0	2.0
8.0	1.5	2.0	2.0
10.0	2.0	2.0	2.5
12.0	2.0	2.5	2.5
14.0	2.0	2.5	2.5
16.0	2.5	2.5	3.0
18.0	2.5	3.0	3.0
20.0	2.5	3.0	3.5
22.0	3.0	3.5	4.0
24.0	3.0	3.5	4.0

NOTE: Insulation thermal conductivity (k-value) is in units of Btu-inches/hour-square feet-degrees F at 200 degrees F mean temperature.

TABLE 2

Minimum Pipe Insulation Thickness (inches)

(For low pressure (less than 16 psig) steam, condensate return, and low temperature (less than 250 degrees F) hot water supply and return piping.)

Nominal Pipe Diameter (in.)	Insulation Thermal Conductivity (k) k less than 0.29	k from 0.29 to 0.40	k greater than 0.40
1.0	0.5	0.5	1.0
1.25	0.5	1.0	1.0
1.5	1.0	1.0	1.0
2.0	1.0	1.0	1.0
2.5	1.0	1.0	1.5

TABLE 2

Minimum Pipe Insulation Thickness (inches)

(For low pressure (less than 16 psig) steam, condensate return, and low temperature (less than 250 degrees F) hot water supply and return piping.)

Nominal Pipe Diameter (in.)	Insulation Thermal Conductivity (k) k less than 0.29	k from 0.29 to 0.40	k greater than 0.40
3.0	1.0	1.5	1.5
4.0	1.5	1.5	1.5
5.0	1.5	1.5	1.5
6.0	1.5	1.5	2.0
8.0	1.5	2.0	2.0
10.0	2.0	2.0	2.0
12.0	2.0	2.0	2.0
14.0	2.0	2.0	2.5
16.0	2.0	2.0	2.5
18.0	2.0	2.5	2.5

NOTE: Insulation thermal conductivity (k-value) is in units of Btu-inches/hour-square feet-degrees F at 200 degrees F mean temperature.

2.3 HEAT DISTRIBUTION PIPING

2.3.1 Steam and High Temperature Hot Water Pipe

Pipe material shall be steel; seamless ASTM A 53/A 53M, Grade B or ASTM A 106, Grade B; or electric resistance welded ASTM A 53/A 53M, Grade B; Schedule 40. ASTM A 53/A 53M, Type F furnace butt welded pipe will not be allowed. Joints will not be allowed in the factory fabricated straight section of the carrier pipe. Factory fabricated piping sections, as part of an expansion loop or bend, shall have all welded joints 100% radiographically inspected in accordance with ASME B31.1. Radiographs shall be reviewed and interpreted by a Certified American Society for Nondestructive Testing (ASNT) Level III radiographer, employed by the testing firm, who shall sign the reading report.

2.3.1.1 Condensate Pipe

Pipe shall be steel; seamless ASTM A 53/A 53M, Grade B or ASTM A 106, Grade B, schedule 80; electric resistance welded ASTM A 53/A 53M, Grade B; Schedule 80. ASTM A 53/A 53M, Type F furnace butt welded pipe will not be allowed. Joints will not be allowed in the factory fabricated section of the carrier pipe. Factory fabricated piping sections, as part of an expansion loop or bend shall have all welded joints 100% radiographically inspected in accordance with ASME B31.1. Radiographs shall be reviewed and interpreted by an ASNT Certified Level III radiographer, employed by the testing firm, who shall sign the reading report.

2.3.1.2 Joints

Joints shall be butt-weld except socket-weld joints will be permitted for pipe sizes 2 inches and smaller. Dye penetrant may be used in place of 100% radiographic inspection for pipe sizes 2 inches and below. Location and elevation of all field joints shall be indicated on detailed design layout drawings. Split-ring welding rings may be used.

2.3.2 Fittings

Welds in factory fittings shall be radiographically inspected. Radiographs shall be reviewed and interpreted by a Certified ASNT Level III radiographer, employed by the testing firm, who shall sign the reading report. The Contracting Officer may review all inspection records, and if any welds inspected are found unacceptable in accordance with ASME B31.1, the fitting shall be removed, replaced, and radiographically reexamined at no cost to the Government.

2.3.2.1 Butt-Welded

Fittings shall be steel; ASTM A 234/A 234M, Grade B or ASME B16.9, same schedule as adjoining pipe. Elbows shall be long radius unless otherwise indicated. Tees shall be full size or reducing as required, having interior surfaces smoothly contoured. Split-ring welding rings may be used.

2.3.2.2 Socket-Welded

Fittings shall be forged steel ASME B16.11; 2000 pound class shall be used for pipe sizes 2 inch and below. Dye penetrant inspection may be used in lieu of radiographic inspection of welded fittings for pipe sizes 2 inches and below.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

3.1.1 Work Plan

A proposed schedule of activities indicating when various items of work and tests are to be carried out and when the representative of the UHDS manufacturer shall be present at job site, not later than 30 days after notice to proceed. A list of characteristics from the UHDS manufacturer shall be submitted indicating what defects or damage will necessitate replacement.

3.1.2 Quality Assurance Plan

Manufacturer's quality assurance plan for fabrication, delivery, storage, installation and testing of system, not later than 30 days after notice to proceed.

3.1.3 Grading

Grading shall be as shown on the contract drawings.

3.1.4 Connecting to Existing Work

New work shall be connected to existing work in a neat and workmanlike

manner. Connections shall be made only in manholes. Where an existing structure must be cut or existing utilities interfere, such obstructions shall be bypassed, removed, replaced or relocated, restored and repaired. Any changes required to the UHDS design as a result of interferences or conflicts shall be approved by the UHDS designer and the Contracting Officer. Work disturbed or damaged shall be replaced to its prior condition.

3.1.5 Coordination

The location of all items of equipment and work of all trades shall be coordinated. Operability and maintainability of the equipment and systems shall be maintained.

3.1.6 Variations

Any variations from the approved, detailed design layout drawings shall be submitted to the Contracting Officer for approval. Variations shall be signed and sealed by the UHDS manufacturers' professional engineer responsible for the complete design of the UHDS.

3.1.7 Storage and Handling During Installation

Equipment and material placed on the job shall remain in the custody of the Contractor until final acceptance whether or not the Contractor has been reimbursed for the equipment and material by the Government. The Contractor shall be solely responsible for the protection of the equipment and material against damage from any source while stored or during installation. Materials shall be protected against damage from UV light, and entry of water and mud, by installing watertight protection on open ends at all times. Sections of the casing or carrier piping found to have been subjected to full or partial submergence in water (which would allow the insulation to become wet) shall be immediately replaced. Materials awaiting installation shall be covered to protect from UV degradation.

3.2 DEMOLITION

3.2.1 Demolition Procedures

Work shall be performed in accordance with requirements for phasing. Pipe, valves, fittings, insulation, and hangers, including the connection to the structure and any fastenings, shall be removed. Openings in manhole or building walls shall be sealed after removal of piping. Material and equipment removed shall become the property of the Contractor and shall be removed from Government property within 1 week and shall not be stored in operating areas. Flame cutting shall be performed with adequate fire protection facilities available as required by safety codes and Contracting Officer.

3.2.2 Asbestos Removal

Asbestos removal shall conform to SECTION 13280 ASBESTOS ABATEMENT.

3.3 PIPE, PIPING JOINTS AND FITTINGS

3.3.1 Joint Preparation

Pipe and fittings shall be cleaned inside and outside before and after

assembly. Dirt, scale, and other foreign matter shall be removed from inside the piping by use of a pipe swab or pipe pig before connecting pipe sections, valves, equipment or fittings. Eccentric connectors shall be used as needed between casing sections to provide drainage of casing section between manholes and between manholes and buildings.

3.3.2 Direction Changes

Changes in direction shall be made with factory-built reinforced fittings. Field-fabricated fittings and miters will not be permitted.

3.4 WELDING

Welding shall conform to SECTION 05093 WELDING PRESSURE PIPING.

3.5 HEAT DISTRIBUTION SYSTEM INSTALLATION

The UHDS manufacturer's representative shall oversee the delivery, storage, installation and testing of the system. Work shall be in accordance with the requirements specified and with the printed instructions of the manufacturer. These specifications shall take precedence over the printed instructions if conflicts arise. Printed instructions shall be submitted to the Contracting Officer prior to system installation.

3.5.1 Verification of Final Elevations

Prior to covering the top of the casing with backfill material, but after all temporary supports have been removed and initial backfilling of the conduit system has been accomplished, the Contractor shall measure and record the elevation of the top of the casing in the trench. Elevations shall be taken at every completed field joint, 1/3 points along each pipe section and top of elbows. These measurements shall be checked against the contract drawings and shall confirm that the conduit system has been installed to the elevations shown on the contract drawings. Slope shall be uniform to within 0.1%. These measurements shall be recorded by the Contractor, included in the UHDS manufacturer's representative daily report, and given to the Contracting Officer prior to covering the casing with backfill material.

3.5.2 Excavation, Trenching, and Backfilling

Excavation, trenching, and backfilling shall be performed as required by the UHDS manufacturer's design and as specified in SECTION 02300 EARTHWORK. Pipe shall lay on a 12 inch minimum sand bed and shall be backfilled with sand on all sides to a minimum of 6 inches as measured from outside of casing. Foundation for system shall be firm and stable. Foundation and backfill shall be free from rocks or substances which could damage the system coating. Concrete anchor and thrust blocks shall be installed in undisturbed earth. Backfilling shall not commence until system has been satisfactorily pressure tested (both hydrostatic test of carrier and air test of casing). Minimum depth of burial to the top of the casing shall be 39 inches. Maximum depth of burial to the top of the casing shall be 10 feet.

3.5.3 UHDS Manufacturer's Representative Responsibilities

The UHDS Manufacturer's representative shall be present at the job site and witness when the following types of work are being performed:

a. Inspection and unloading.

b. Inspection of trench prior to commencing installation of system.

c. Inspection of concrete anchors and thrust blocks.

d. Pneumatic and Hydrostatic testing.

e. Field joint closure work.

f. Air test of casing.

g. Holiday test of conduit coating.

h. Repair of any coating.

i. Installation of cathodic protection system.

j. Initial backfill up to 10 inches above the top of the casing.

k. Verification of final elevations. Elevation readings shall be witnessed and recorded.

l. Testing of cathodic protection system.

m. Operational tests.

The UHDS manufacturer's representative shall notify the Contractor immediately of any problems. The UHDS manufacturer's representative shall notify the Contracting Officer of problems requiring immediate action; otherwise, the daily reports shall note any problems encountered and indicate the corrective actions taken.

3.5.4 UHDS Manufacturer's Representative Reports

The UHDS manufacturer's representative shall: prepare and sign a written daily report; present the original daily report to the Contracting Officer no later than one working day after it is prepared; and forward 1 copy to the manufacturer's main office. The report shall state whether or not the condition and quality of the materials used and the delivery, storage, installation and testing of the system are in accordance with the drawings, specifications, and manufacturer's printed instructions and are satisfactory in all respects. When any work connected with the installation is unsatisfactory, the report shall state what corrective action has been taken or shall contain the UHDS manufacturer's recommendations for corrective action. The report shall identify any condition that could result in an unsatisfactory installation, including such items as open conduit ends left in the trench overnight and improper manhole entries. The daily reports shall be reviewed, signed and sealed, on a weekly basis, by the registered engineer responsible for the system design. Signed and sealed copies of the daily reports shall be submitted with the payment request. Requests for payment will be denied if the weekly review is not accomplished. Upon completion of the work and before final acceptance, a notarized Certificate of Compliance, signed by a principal officer of both the manufacturing and the contracting firms, stating that the installation is satisfactory and in accordance with drawings, specifications, and manufacturer's instructions shall be delivered to the Contracting

Officer. The UHDS manufacturer shall retain a copy of all daily reports and the Certificate of Compliance for 5 years after final acceptance of the system by the Government.

3.5.5 Protection

Casing coating shall be protected from damage during unloading, storage, rigging and installation. Casing and carrier pipe ends shall be protected from water intrusion during unloading, storage, rigging and installation. Piping and accessories shall be protected from damage due to exposure to UV light.

3.5.6 Defective Material

The UHDS manufacturer's representative shall take prompt action to remove from the site all damaged or defective material, subject to rejection in accordance with the quality assurance provisions included in the manufacturer's submittals and printed instructions, and shall order prompt replacement of such material.

3.5.7 Cathodic Protection Installation

Provide cathodic protection for all steel casing systems and all buried exposed metal. Assume that 25 percent of the exterior of the UHDS is exposed metal. Cathodic protection systems shall have a minimum design life of 25 years and shall conform to SECTION 13110 CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE). Dielectric pipe flanges and waterways, and isolation devices shall be provided at all points necessary. Test stations at grade shall be provided on each section of the piping system. Dielectric waterways shall have temperature and pressure rating equal to or greater than that specified for the connecting piping. Waterways shall have metal connections on both ends suited to match the connecting piping. Dielectric waterways shall be internally lined with an insulator specifically designed to prevent current flow between dissimilar metals. Dielectric flanges shall meet the performance requirements described herein for dielectric waterways.

3.6 TESTS

Leak-tightness of all piping systems shall be demonstrated by performing pressure tests (hydrostatic, pneumatic) and operational tests. Heat distribution system shall be pressure tested in conformance with specified requirements and printed instructions for the system supplied; tests shall include carrier piping and casing. The carrier pipe shall be hydrostatically tested. Casings of DDT systems shall be pneumatically tested. Casing and end seals of WSL system shall be tested for intrusion of water into the casing and insulation.

3.6.1 Holiday Testing of Direct-buried System Steel Casings

Entire exterior surface of the casing, including the bottom exterior surface, shall be tested for faults in coating after installation in trench, prior to backfilling, using test method and voltage recommended by coating manufacturer. If any holidays are found, they shall be repaired and the coating retested. System shall not be backfilled until all holidays are eliminated.

3.6.2 Pneumatic, Hydrostatic and Operational Tests

Before conducting heat distribution system tests, lines shall be flushed with high pressure water until discharge shows no foreign matter.

3.6.2.1 Pneumatic Test

The casing of DDT systems shall be pneumatically tested after welding and before field coating using air as the test medium. The test pressure shall be 15 psig. Persons not working on the test operations shall be kept out of the testing area while testing is proceeding. The test shall be made on the system as a whole or on sections that can be isolated. Joints in sections shall be tested prior to backfilling when trenches must be backfilled before the completion of other pipeline sections. The test shall continue for 24 hours from the time of the initial readings to the final readings of pressure and temperature. The initial test readings of the instrument shall not be made for at least 1 hour after the casing has been subjected to the full test pressure, and neither the initial nor final readings shall be made at times of rapid changes in atmospheric conditions. There shall be no indication of reduction of pressure during the test after corrections have been made for changes in atmospheric conditions in conformity with the relationship T(1)P(2) = T(2)P(1), in which T and P denote absolute temperature and pressure, respectively, and the numbers denote initial (1) and final (2) readings. Pressure shall be measured with a pressure gauge conforming to ASME B40.1. A throttling type needle valve or a pulsation dampener and shutoff valve may be included. The diameter of the face shall be at least 4.5 inches with a measurable range of 0 to 15 psig and graduations of at least 0.5 psig. During the test, the entire system shall be completely isolated from all compressors and other sources of air pressure. Each joint shall be tested while under test pressure by means of soap and water or an equivalent nonflammable solution prior to backfilling or concealing any work. All labor, materials and equipment for conducting the tests shall be furnished by the Contractor and shall be subject to inspection at all times during the tests. The Contractor shall maintain proper safety precautions for air pressure testing at all times during the tests.

3.6.2.2 Hydrostatic Test

Carrier piping shall be tested hydrostatically before insulation is applied at field joints and shall be proved tight at a pressure 1.5 times the heat distribution supply pressure of 100 psig for 2 hours. There shall be no indication of reduction of pressure during the test. Pressure shall be measured with a device calibrated to be read in increments not greater than 0.1 psi.

3.6.2.3 Operational Test

Prior to acceptance of the installation, Contractor shall subject system to operating tests simulating actual operating conditions to demonstrate satisfactory functional and operating efficiency. These operating tests shall cover a period of not less than 6 hours for each portion of system tested. Contractor shall submit for approval a schedule of the tests to be performed. The contractor shall provide calibrated instruments, equipment, facilities and labor, at no additional cost to the Government. When failures occur, problems shall be repaired and test repeated.

3.6.3 Deficiencies

Deficiencies discovered shall be corrected at the Contractor's expense. Major deficiencies, or failure to correct deficiencies, may be considered cause for rejecting the entire installation.

3.7 VALVE MANHOLES

Valve manholes, piping, and equipment in valve manholes shall be in accordance with the contract drawings and SECTION 02559 HEAT DISTRIBUTION SYSTEMS IN UTILIDORS AND MANHOLES.

3.8 BURIED UTILITY WARNING AND IDENTIFICATION

3.8.1 Plastic Marking Tape

Polyethylene plastic tape manufactured specifically for warning and identifying buried utility lines shall be supplied and installed. Tape shall be buried above the pipe during the trench backfilling operation and shall be buried approximately 12 inches below grade. Tape shall be polyethylene with a metallic core. Tape shall be acid- and alkali-resistant and shall have a minimum strength of 1750 psi lengthwise and 1500 psi crosswise with an elongation factor of 350 percent. 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 metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. The tape shall be of a type specifically manufactured for marking and locating metallic underground utilities. Tape shall be 6 inches wide and printed with a caution and identification of the piping system over the entire tape length. Tape shall be yellow with bold black letters. Tape color and lettering shall be unaffected by moisture and other substances contained in the backfill material.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02559

HEAT DISTRIBUTION SYSTEMS IN UTILIDORS AND MANHOLES

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 SUBMITTALS SUPPLEMENTAL
1.3.1 Heat Distribution System
1.3.2 Spare Parts
1.3.3 Insulation
1.3.4 Calculation of Pipe Supports
1.3.5 Calculation of Pipe Anchors
1.4 DELIVERY AND STORAGE
1.5 FIELD MEASUREMENTS
1.6 OPERATION AND MAINTENANCE MANUALS
1.6.1 Steam Distribution System

PART 2 PRODUCTS

2.1 GENERAL MATERIALS AND EQUIPMENT REQUIREMENTS
2.1.1 Standard Products
2.1.2 Nameplates
2.1.3 Asbestos Prohibition
2.1.4 Electrical Work
2.2 PIPING AND FITTINGS
2.2.1 Steel Pipe
2.2.1.1 Nipples
2.2.1.2 Steel Flanges
2.2.1.3 Flange Gaskets
2.2.1.4 Pipe Threads
2.2.2 Fittings
2.2.2.1 Welded Fittings
2.2.2.2 Malleable Iron Fittings
2.2.2.3 Unions
2.2.3 Insulating Flanges and Dielectric Waterways
2.3 VALVES
2.3.1 Steel Valves
2.3.2 Bronze Valves
2.3.2.1 Globe, Gate, and Angle Valves
2.3.2.2 Check Valves
2.3.3 Packing
2.4 STEAM TRAPS
2.4.1 Thermodynamic Traps
2.5 AIR VENTS
2.5.1 Steam Air Vents
2.5.2 Condensate Air Vents
2.6 STRAINERS
2.7 PRESSURE GAUGES
2.8 THERMOMETERS
2.8.1 Dial

2.9 INSULATION AND JACKETING
2.9.1 Insulation for Piping in Utilidors and Valve Manholes
2.9.2 Aluminum Jacket
2.9.3 Nonmetallic Jacket
2.9.4 Bands
2.9.5 Insulation for Flanges, Unions, and Fittings
2.9.6 Insulation for Valves and Expansion Joints
2.9.7 Insulation Inserts at Pipe Supports and Pipe Carriers
2.10 EXPANSION JOINTS
2.11 SUMP PUMPS
2.12 MISCELLANEOUS METAL

PART 3 EXECUTION

3.1 SITEWORK
3.1.1 Excavation, Trenching, and Backfilling
3.1.2 Removal, Replacement, or Relocation of Interferences
3.1.3 Modifications to Existing Facilities
3.1.4 Electric Work
3.1.5 Painting
3.2 INSTALLATION
3.3 PIPING
3.3.1 General Piping Requirements
3.3.2 Welded Joints
3.3.3 Flanged and Threaded Joints
3.3.3.1 Flanged Joints
3.3.3.2 Threaded Joints
3.3.4 Reducing Fittings
3.3.5 Branch Connections
3.4 AIR VENTS
3.5 PIPE INSERTS AND SUPPORTS
3.5.1 Pipe Supports in Utilidors and Valve Manholes
3.5.2 Pipe Supports
3.5.3 Pipe Racks
3.6 WELDING
3.7 RADIOGRAPHIC TESTING
3.8 INSULATION
3.8.1 Installation
3.8.1.1 Preparation
3.8.1.2 Thickness
3.8.2 Insulation on Pipes Passing Through Sleeves
3.8.3 Covering of Insulation in Utilidors and Valve Manholes
3.9 VALVE MANHOLES AND ACCESSORIES
3.9.1 Valve Manhole Construction and Accessories
3.9.1.1 Piping and Equipment in Valve Manholes
3.9.1.2 Sump Pumps Installation
3.10 UTILIDOR SYSTEM
3.10.1 Concrete
3.10.2 Coordination with Existing Utilities
3.10.3 Piping Support System
3.10.4 Pipe Expansion
3.10.5 Pipe Anchors
3.11 TESTS
3.11.1 Control Valves and PRV Stations
3.11.2 Cleaning of Piping
3.11.3 Test Pressure Gauges
3.11.4 Field Tests
3.11.4.1 Hydrostatic Tests of Service Piping
3.11.4.2 Equipment Tests

3.11.4.3 Insulating Flange Test
3.11.4.4 Operational Tests
3.11.4.5 Utilidor Water Removal Tests

-- End of Section Table of Contents --

SECTION 02559

HEAT DISTRIBUTION SYSTEMS IN UTILIDORS AND MANHOLES

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 designations only.

ASTM INTERNATIONAL (ASTM)

ASTM A 36/A 36M	(2000a) Carbon Structural Steel
ASTM A 47/A 47M	(1999) Ferritic Malleable Iron Castings
ASTM A 53/A 53M	(1999b) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A 106	(1999el) Seamless Carbon Steel Pipe for High-Temperature Service
ASTM A 123/A 123M	(2001a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 234/A 234M	(2000) Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
ASTM A 733	(1999) Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples
ASTM B 209	(2000) Aluminum and Aluminum-Alloy Sheet and Plate
ASTM C 533	(1995) Calcium Silicate Block and Pipe Thermal Insulation
ASTM C 547	(1995) Mineral Fiber Pipe Insulation
ASTM C 552	(2000) Cellular Glass Thermal Insulation
ASTM F 1139	(1988; R 1998) Standard Specification for Steam Traps and Drains

ASME INTERNATIONAL (ASME)

ASME B1.20.1	(1983; R 1992) Pipe Threads, General Purpose (Inch)
ASME B16.3	(1998) Malleable Iron Threaded Fittings

ASME B16.5	(1996; B16.5a) Pipe Flanges and Flanged Fittings NPS 1/2 thru NPS 24
ASME B16.9	(1993) Factory-Made Wrought Steel Buttwelding Fittings
ASME B16.11	(1996) Forged Fittings, Socket-Welding and Threaded
ASME B16.34	(1997) Valves - Flanged, Threaded, and Welding End
ASME B16.39	(1998) Malleable Iron Threaded Pipe Unions Classes 150, 250, and 300
ASME B31.1	(1998) Power Piping
ASME B40.1	(1991) Gauges - Pressure Indicating Dial Type - Elastic Element

EXPANSION JOINT MANUFACTURERS ASSOCIATION (EJMA)

EJMA Stds	(1993; Addenda 1995; Errata 1996; 7th Ed, 1998) EJMA Standards

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS SP-25	(1998) Standard Marking System for Valves, Fittings, Flanges and Unions
MSS SP-45	(1998) Bypass and Drain Connections
MSS SP-58	(1993) Pipe Hangers and Supports - Materials, Design and Manufacture
MSS SP-69	(1996) Pipe Hangers and Supports - Selection and Application
MSS SP-80	(1997) Bronze Gate, Globe, Angle and Check Valves

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2002) National Electrical Code

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC SP 10	(1994) Near-White Blast Cleaning

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Heat Distribution System

SD-03 Product Data

Spare Parts

SD-04 Samples

Insulation

SD-05 Design Data

Calculation of Pipe Supports; G.

Calculation of Pipe Anchors; G.

SD-06 Test Reports

Tests

Performance test reports in booklet form showing all field tests performed to adjust each component and all field tests performed to prove compliance with the specified performance criteria, upon completion and testing of the installed system. Each test report shall indicate the final position of controls and valves.

SD-07 Certificates

Flange Gasket Kits

Certificate from the material supplier of the electrically insulating flange gasket kits stating that the supplied material meets specified requirements and that provides evidence that satisfactory operating requirements have been met, before the materials are delivered. Certificate shall be signed by an official authorized to certify in behalf of material supplier or product manufacturer and shall identify quantity and date or dates of shipment or delivery to which the certificates apply.

SD-10 Operation and Maintenance Data

Steam Distribution System; G.

Six copies of operation and six copies of maintenance manuals for the equipment furnished. One complete set, prior to performance testing and the remainder upon acceptance. Manuals shall be provided prior to the field training course.

1.3 SUBMITTALS SUPPLEMENTAL

See paragraphs below for further descriptions of submittals required by paragraph SUBMITTALS:

1.3.1 Heat Distribution System

Detail drawings for alignment guides, anchors, expansion joints, flanges, gaskets, and supports, insulation, pipe, pressure gauges, steam traps, sump pumps, thermometers, and valves, including a complete list

of equipment and material, including manufacturer's descriptive and technical literature, performance charts and curves, catalog cuts, and installation instructions. Drawings shall contain complete wiring and schematic diagrams, pipe stress calculations for any revised expansion joints or expansion loops, and any other details required to demonstrate that the system has been coordinated and will properly function as a unit. Drawings shall show proposed system layout, provisions for expansion, pipe anchors and guides, and layout and anchorage of equipment and appurtenances in valve manholes, and equipment relationship to other parts of the work including clearances for maintenance and operation.

1.3.2 Spare Parts

Spare parts data for each different item of material and equipment specified, after approval of the related submittals and not later than the start of the field tests. The data shall include a complete list of parts and supplies and source of supply.

1.3.3 Insulation

Display sample sections for insulation of pipe, elbow, tee, valve, support point, and terminating points. After approval of material and prior to insulation of piping, a display shall be prepared of insulated sections showing compliance with specifications, including showing fastening, sealing, jacketing, straps, waterproofing, supports, anchors, and saddles. Display sample sections shall remain on display at the jobsite during the construction period until no longer needed.

1.3.4 Calculation of Pipe Supports

Calculation of pipe supports shall be submitted with support system descriptive data.

1.3.5 Calculation of Pipe Anchors

Calculation of pipe anchors shall be submitted with anchor sizes and drawings showing location and details of anchor.

1.4 DELIVERY AND STORAGE

All materials and equipment delivered and placed in storage shall be stored with protection from the weather; excessive humidity and excessive temperature variation; and dirt, dust, or other contaminants.

1.5 FIELD MEASUREMENTS

The Contractor shall become familiar with all details of the work, verify all dimensions in the field, and shall advise the Contracting Officer of any discrepancy before performing the work.

1.6 OPERATION AND MAINTENANCE MANUALS

1.6.1 Steam Distribution System

Operation manuals shall detail the step-by-step procedures required for system start up, operation, and shutdown. Operation manuals shall include the manufacturer's name, model number, parts list, and brief description of all equipment and their basic operating features.

Maintenance manuals shall list routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guides. Maintenance manuals shall include piping and equipment layout and simplified wiring and control diagrams indicating location of electrical components with terminals designated for wiring, as installed.

PART 2 PRODUCTS

2.1 GENERAL MATERIALS AND EQUIPMENT REQUIREMENTS

2.1.1 Standard Products

Materials and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of such products and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. Equipment shall be supported by a service organization that is, in the opinion of the Contracting Officer, reasonably convenient to the site.

2.1.2 Nameplates

Each major item of equipment such as sump pumps, motors, steam traps, and pressure reducing valves shall have the manufacturer's name, address, type or style, model or serial number, and catalog number on a plate secured to the item of equipment.

2.1.3 Asbestos Prohibition

Asbestos and asbestos-containing products shall not be used.

2.1.4 Electrical Work

Motors, manual or automatic motor control equipment, and protective or signal devices required for the operation specified shall be provided under this section in accordance with NFPA 70 and SECTION 16375 ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND.

2.2 PIPING AND FITTINGS

Unless otherwise specified, all pipe, fittings, valves, and piping accessories shall conform to the requirements of ASME B31.1, and shall be the proper type, class, and grade for pressure and temperature of the heating medium.

2.2.1 Steel Pipe

Steel pipe 2 inches in diameter and larger shall be seamless or electric-resistance welded conforming to ASTM A 53/A 53M, Grade B, Type E or S; or to ASTM A 106, Grade B. Steel pipe 1-1/2 inches in diameter and smaller shall be seamless conforming to ASTM A 106, Grade B. Condensate piping, gauge piping, and piping 3/4 inch in diameter and smaller shall be schedule 80. All other pipe shall be schedule 40. Standard and Extra Strong schedule pipes shall not be considered an alternative to schedule 40 and 80 pipes.

2.2.1.1 Nipples

Nipples shall conform to ASTM A 733, schedule 40 or schedule 80, as required to match adjacent piping.

2.2.1.2 Steel Flanges

Steel flanges shall conform to ASME B16.5 Class 150 and shall match valves or flanged fittings on which used. Flanges shall be raised face type. Flanges shall have the manufacturer's trademark affixed in accordance with MSS SP-25 so as to permanently identify the manufacturer.

2.2.1.3 Flange Gaskets

Flange gaskets shall be metal composition, spiral wound type at steam and condensate service. Gasket materials shall be suitable for the media carried and the maximum service temperature of each location, as indicated on the drawings.

2.2.1.4 Pipe Threads

Pipe threads shall conform to ASME B1.20.1. Pipe threads may be used only on pipe 3/4 inch or smaller.

2.2.2 Fittings

Fittings shall have the manufacturer's trademark affixed in accordance with MSS SP-25 so as to permanently identify the manufacturer.

2.2.2.1 Welded Fittings

Welded fittings shall conform to ASTM A 234/A 234M, butt-welded or socket-welded, schedule 40 or schedule 80, as required to match connecting piping. Butt welded fittings shall conform to ASME B16.9, and socket welded fittings shall conform to ASME B16.11. Standard and Extra Strong schedule fittings shall not be considered an alternative to schedule 40 and 80 fittings.

2.2.2.2 Malleable Iron Fittings

Fittings shall conform to ASME B16.3, ASTM A 47/A 47M, class as required to match connecting piping.

2.2.2.3 Unions

Unions shall conform to ASME B16.39, schedule 40 or schedule 80, as required to match adjacent piping.

2.2.3 Insulating Flanges and Dielectric Waterways

Insulating flanges or flange gasket kits shall be installed at every pipe connection from the utilidor system to an underground system and at dissimilar metals. The kit shall consist of a flange gasket, bolt sleeves, and one insulating washer and one steel washer for both ends of each bolt. The gasket kits shall be capable of electrically isolating the pipe at the pressure and temperature of the heating medium at the point of application. Material of the type being used must have been installed in an installation which has been satisfactorily operating for not less than 2 years. The Contractor shall ensure that these kits are provided and properly installed according to manufacturer published instructions as indicated. Dielectric waterways shall have temperature and pressure rating equal to or greater than that specified for the connecting piping and shall be used for joining dissimilar metals, 3/4

inch and smaller threaded pipe. Waterways shall have metal connections on both ends suited to match connecting piping. Dielectric waterways shall be internally lined with an insulator specifically designed to prevent current flow between dissimilar metals. Dielectric flanges shall meet the performance requirements described herein for dielectric waterways.

2.3 VALVES

Unless otherwise specified, valves shall comply with the material, fabrication, and operating requirements of ASME B31.1. Valves shall be suitable for the temperature and pressure requirements of the system on which used. Valves 2 inches and smaller shall be bronze. Valves 2-1/2 inches and larger shall be steel. Valves shall have the manufacturer's trademark.

2.3.1 Steel Valves

Globe, gate, angle, and check valves shall conform to the requirements of ASME B16.34 and ASME B31.1 for the temperature and pressure requirements of the system. Valves shall be Class 150, cast steel, rising stem OS&Y (Outside Screw and Yoke) with raised face flanges. Adjoining flanges at piping or piping accessories shall also be raised faced type. Valves for steam service 6 inches and larger shall have a 1 inch minimum gate or globe bypass valve sized in conformance with MSS SP-45.

2.3.2 Bronze Valves

2.3.2.1 Globe, Gate, and Angle Valves

Globe, gate, and angle valves shall conform to requirements of MSS SP-80. Valves shall be Class 300, bronze body, rising stem with threaded connections.

2.3.2.2 Check Valves

Check valves shall conform to the requirements of MSS SP-80. Valves shall be Class 300, bronze body, with threaded connections.

2.3.3 Packing

Packing used with valves shall not contain asbestos. Valve stem packing shall be die-formed, ring type specifically designated as suitable for the temperature and pressure of the service and compatible with the fluid in the system. Packing rings shall be polytetrafluoroethylene with minimum 50 percent graphite filament top and bottom rings. Valves 1-1/2 inches and smaller shall have four or five packing rings and valves 2 inches and larger shall have at least six packing rings. Spiral or continuous packing will not be acceptable. A metal insert shall be provided having proper clearance around the valve stem at the bottom of the stuffing box and acting as a base for the packing material. Packing glands shall be furnished with a liner of noncorrosive material and shall be of one piece construction with provisions for not less than two bolts for packing adjustment.

2.4 STEAM TRAPS

Class of trap bodies shall be suitable for a working pressure of not

less than 1.5 times the steam supply pressure, but not less than 200 psi, and traps shall be capable of operation under a steam-supply pressure as indicated. Traps shall be sized for the operating load and shall have capacities as shown when operating under the specified working conditions. Traps shall fail open.

2.4.1 Thermodynamic Traps

Traps shall be thermodynamic type conforming to ASTM F 1139. For steam lines 2 inches and smaller, traps shall have 3/8 inch inlet and outlet. For steam lines over 2 inches, traps shall have 1/2 inch inlet and outlet.

2.5 AIR VENTS

2.5.1 Steam Air Vents

Steam air vents shall be a quick-acting valve that continuously removes air. The air vent shall use a self-adjusting balanced pressure thermostatic element to regulate air release, and shall automatically close tight to prevent escape of steam and condensate. The internal parts shall be constructed of corrosion-resisting metal. The vent shall be designed to withstand the maximum piping system pressure. Each vent shall be provided with a manual isolation valve. The air vents shall be sized for normal operating conditions, not for start-up conditions (Start-ups will be a supervised operation using manually operated blow down and vent valves). The maximum operating temperature shall be 600 degrees F.

2.5.2 Condensate Air Vents

Condensate air vents shall use a float type valve to regulate air release, and shall automatically close tight to prevent escape of condensate. The internal parts shall be constructed of corrosion-resisting metal. The vent shall be designed to withstand the maximum piping system pressure. Each vent shall be provided with a manual isolation valve. The air vents shall be sized for normal operating conditions, not for start-up conditions (Start-ups will be a supervised operation using manually operated blow down and vent valves). The maximum operating temperature shall be 325 degrees F.

2.6 STRAINERS

Strainers shall be basket or Y-type with connections the same size as the pipe lines in which the connections are installed. Strainer shall be suitable for the temperature and pressure requirements of the system. The strainer bodies shall be of cast steel with bottoms drilled and plugged. The bodies shall have arrows clearly cast on the sides to indicate the direction of flow. Each strainer shall be equipped with an easily removable cover and sediment basket. The body or bottom opening shall be equipped with nipple and gate valve for blowdown. The basket shall be of not less than 0.025 inch thick stainless steel, or monel with small perforations of sufficient number to provide a net free area through the basket of at least 2.5 times that of the entering pipe. The flow shall be into the basket and out through the perforations.

2.7 PRESSURE GAUGES

Gauges shall conform to ASME B40.1 and shall be provided with a pig-tail

snubber for steam lines or a pulsation dampener for condensate lines. All gauges shall be provided with a shut-off isolation valve. Minimum dial size shall be 4-1/4 inches.

2.8 THERMOMETERS

2.8.1 Dial

Dial type thermometer shall be 3-1/2 inches in diameter chromium plated case, remote-type bulb or direct-type bulb as required, plus or minus 2 degree F accuracy, white face with black digits graduated in 2 degree F increments.

2.9 INSULATION AND JACKETING

2.9.1 Insulation for Piping in Utilidors and Valve Manholes

Insulation for all piping, fittings, and valves in manholes (and extending 5 feet into the utilidors) shall be molded calcium silicate conforming to ASTM C 533, Type I, asbestos free with an aluminum jacket covering. Insulation for all piping, fittings, and valves in utilidors shall be molded calcium silicate conforming to ASTM C 533, Type I, asbestos free with an aluminum jacket covering, or molded mineral fiber insulation conforming to ASTM C 547, Class 2, asbestos free with a nonmetallic jacket covering, or cellular glass insulation conforming to ASTM C 552. Insulation shall be factory or field applied. Other than FOAMGLAS, laminated construction shall not be used in thicknesses less than 4 inches. Steam trap and steam trace piping shall be uninsulated, except in selected high traffic locations requiring crossing by personel which shall be insulated with molded mineral fiber insulation conforming to ASTM C 547, Class 2, asbestos free with an aluminum jacket covering.

2.9.2 Aluminum Jacket

Jacket shall be smooth sheet, 0.016 inch nominal thickness; ASTM B 209, Type 3003, 3105, or 5005. Aluminum jacket shall be used over calcium silicate insulation.

2.9.3 Nonmetallic Jacket

Nonmetallic jackets shall be of the AWJ (All Weather Jacket) type. Nonmetallic jacket shall consist of a 6 ounce per square yard fiberglass fabric impregnated with chlorosulfonated polyethylene (Hypalon) and a 1.5 mils polyvinyl fluoride film (Tedlar) bonded to it. Overall thickness of the composite shall be 0.010 inch and weigh approximately 10.5 ounces per square yard. Jacket may be either field or factory applied to the insulation. Nonmetallic jacket shall be used with molded mineral fiber insulation. This jacket shall not be used with any calcium silicate insulation.

2.9.4 Bands

Bands for aluminum jacket shall be 3/8 inch wide and 32 gauge thickness made of aluminum or annealed stainless steel. Bands for insulation shall be 1/2 inch wide and 32 gauge thickness made of annealed stainless steel.

2.9.5 Insulation for Flanges, Unions, and Fittings

Flanges, unions, and fittings shall be insulated with premolded prefabricated, or field fabricated segments of insulation. Insulation shall be removable and reusable and shall have essentially the same thermal characteristics and thickness as the adjoining piping.

2.9.6 Insulation for Valves and Expansion Joints

Valves and expansion joints shall be insulated with premanufactured blankets with heavy fabric covers. Products shall be manufactured for the purpose intended here and shall be suitable for the temperatures encountered. Insulation shall be removable and reusable and shall have essentially the same thermal characteristics and thickness as the adjoining piping. Insulation shall be secured with nylon buckles and straps or with velcro straps on the outside of the insulation. Insulation secured with wire or rope lacing systems shall not be acceptable.

2.9.7 Insulation Inserts at Pipe Supports and Pipe Carriers

Insulation inserts at pipe supports or carriers shall be a system consisting of calcium silicate pipe insulation, a vapor barrier and jacket to match the adjacent insulation system, and a steel protection saddle welded to the pipe. Insert and metal shield dimensions shall be appropriate for calculated loads.

2.10 EXPANSION JOINTS

Expansion joints shall be the externally pressurized, guided type. Expansion joints shall be designed with a permanent packless seal (such as an internal bellows). Expansion joints shall provide for either single or double slip of connected pipes, as required or indicated, and for not less than the traverse indicated. Joints shall be designed for steam working pressure not less than 100 psi and shall be in accordance with applicable requirements of EJMA Stds and ASME B31.1. End connections shall be flanged unless specified otherwise on the drawings. Joints shall be provided with anchor base where required or indicated. Joint components shall be fabricated from material equivalent to that of the pipeline. Expansion joint travels shall be as specified on the drawings. These travels were designed to compensate for the differences between an installation temperature of 50 degrees F to a potential operating temperature as indicated on the drawings. Initial preset extension or compression of the expansion joints shall be made in accordance with manufacturer's recommendations to compensate for the difference between ambient temperature at time of installation and a design installation temperature of 50 degrees F. Pipe alignment guides shall be the cylinder type with a guide spider attached to the pipe. Pipe alignment guides using a slide plate shall not be acceptable. Pipe alignment guides shall be installed as recommended by joint manufacturer, but in any case shall not be more than 5 feet from expansion joint, except that for lines 4 inches or smaller, guides shall be installed not more than 2 feet from the joint. Pipe alignment guides shall accommodate up to a maximum of 8 inches of movement. Service outlets shall be provided where indicated.

2.11 SUMP PUMPS

Sump pumps with capacities indicated shall be of the submersible type capable of operating while completely submerged and shall be electrically driven. The pump and motor shall be capable of

continuously pumping liquids at a temperature of 180 degrees F. Pumps shall have permanently lubricated bearings, stainless steel monel shafts, bronze impellers, screened inlets, and housings of bronze. Each sump pump shall be capable of passing a 3/8 inch solid sphere. Motors shall have horsepower indicated, and shall have overload protection. The sump pump manufacturer shall verify and provide written certification of all special requirements noted herein. Pumps shall be automatically controlled by a submersible switch assembly with pump wiring and switch suitable for submersion in 180 degrees F liquids. Motors shall be 115 volts, 60 Hz, single phase. Two sump pumps in a duplex arrangement shall be provided as indicated. An automatic, alternating lead lag controller shall be furnished. All controllers, water level switches, and electrical connections shall be suitable for service at 100 percent humidity, at 180 degrees F temperature, and occasional water submersion. Sump pump automatic on-off switches shall have demonstrated 200,000 cycles at 180 degrees F and 100 percent relative humidity and shall withstand total submersion in water at 180 degrees F. Another switch shall be provided to indicate high water level and shall be connected to an emergency warning light mounted on or adjacent to the valve manhole as shown. Auxiliary contacts in a separate junction box shall be provided to permit a future connection to an Energy Monitoring and Control System (EMCS) for monitoring the operation of each pump motor and the high water level alarm system.

2.12 MISCELLANEOUS METAL

Miscellaneous metal not otherwise specified shall conform to SECTION 05500 MISCELLANEOUS METAL. Miscellaneous metal bolted together, shop welded, or assembled in the field, and pipe supports including structural cross support members and anchors shall be hot-dip galvanized in accordance with SECTION 05500 MISCELLANEOUS METAL.

PART 3 EXECUTION

3.1 SITEWORK

3.1.1 Excavation, Trenching, and Backfilling

Excavation, trenching, and backfilling of the utilidor systems, and valve manholes, and relocation of interferences and modifications to existing facilities shall be as shown and in accordance with SECTION 02300 EARTHWORK and SECTION 02560 UTILIDOR SYSTEM

3.1.2 Removal, Replacement, or Relocation of Interferences

Interferences indicated or found during construction shall be removed, replaced, or relocated. Removal, replacement, or relocation shall be as shown, or as approved by the Contracting Officer. Examples of interferences include:

a. Storm and sanitary sewers and manholes.

b. Water lines, fire hydrants, and lawn sprinkler systems.

c. Power and communication lines, conduits, poles, and guys.

d. Fences, sidewalks, and signs.

e. Grass, shrubs, trees, and rocks.

3.1.3 Modifications to Existing Facilities

Modifications to existing facilities shall be made as shown. Examples of modifications include:

a. Removal and replacement of street or parking area pavements.

b. Removal and replacement of curbs, gutters, and sidewalks.

c. Reconstruction of existing valve manholes.

d. New heat distribution piping entrances to buildings, valve manholes, or utilidors.

3.1.4 Electric Work

Any wiring required for the operation of the equipment specified, but not shown on the electrical drawings, shall be provided under this section in accordance with SECTION 16370 ELECTRICAL DISTRIBUTION SYSTEM, AERIAL, and SECTION 16375 ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND.

3.1.5 Painting

The heat affected zone of field welded galvanized surfaces and other galvanized surfaces damaged during installation shall be cleaned in compliance with SSPC SP 10 and painted in accordance with SECTION 09900 PAINTS AND COATINGS.

3.2 INSTALLATION

Piping shall be installed as indicated on the drawings. Piping in manholes is shown in general configuration. Dimensions and lengths may vary slightly depending on pipe and fitting dimensions, location of supports and anchors, and fabrication. The Contractor shall ensure that the final piping arrangement fits and conforms to the general configuration shown on the drawings. Pipe shall be cut accurately to measurements established at the site by the Contractor and shall be worked into place without springing or forcing. Care shall be taken not to weaken structural portions of the utilidor or manholes.

3.3 PIPING

3.3.1 General Piping Requirements

Pipe shall be accurately cut to measurements established at the site and shall be worked into place without springing or forcing. Pipe shall clear all openings and equipment. Any cutting or other weakening of structural members to facilitate piping installation will not be permitted, without the prior approval of the Contracting Officer's representative. Burrs shall be removed from ends of pipe by reaming. Installation shall permit free expansion and contraction without damage to joints or supports. Piping shall be installed in accordance with ASME B31.1. Joints for piping in utilidors and valve manholes shall be welded, except joints at valves and expansion joints which shall be flanged, unless otherwise indicated on the drawings. Joints at traps, strainers, and at valves 3/4 inch and smaller in steam, condensate, and drip lines, shall use unions and be threaded. Supports, anchors, or stays shall not be attached where either expansion or the weight of the

pipe will cause damage to permanent construction. Noninsulated ferrous parts of the piping, piping support system, or equipment shall be hot-dip galvanized after fabrication in conformance with ASTM A 123/A 123M. The supports shall not rest in any drainage trenches in the utilidor floors.

a. Expansion of piping shall be provided for by expansion joints, by changes in the direction of the run of pipe, or by expansion loops as indicated on the drawings.

b. Changes in direction shall not be made by bending the pipe.

c. All piping, unless otherwise indicated, shall be pitched with a grade the same as the utilidor. The slope shall be maintained throughout the system, including through each leg of each expansion loop, each change of direction of the piping and each expansion joint.

d. Open ends of pipe lines and equipment shall be properly capped or plugged during installation to keep dirt and other foreign matter out of the system.

3.3.2 Welded Joints

Joints between sections of pipe and between pipe and fittings shall be welded. The welding shall conform to the requirements specified in paragraph WELDING. Branch connections shall be made with welding tees and reducers at all connections of building service laterals to main distribution lines, regardless of size. Forged branch outlet fittings may be used for connection of smaller miscellaneous piping. However, no forged branch outlet fittings larger than 2 inches shall be permitted to be used for connections, even where the connection is not between a building service lateral and a main distribution line. Forged branch outlet fittings shall be flared for improved flow where attached to the run, reinforced against external strains, and designed to withstand full pipe bursting strength.

3.3.3 Flanged and Threaded Joints

3.3.3.1 Flanged Joints

Joints shall be faced true, provided with gaskets, and made perfectly square and tight. Electrically isolated flange joints shall be provided at all connections to building underground systems and between dissimilar metals.

3.3.3.2 Threaded Joints

Joints shall have graphite or inert filler and oil, graphite compound, or polytetrafluoroethylene tape applied to the male threads only. Dielectric waterways shall be used at connections of dissimilar metals in 3/4 inch and smaller piping.

3.3.4 Reducing Fittings

Changes in horizontal piping sizes shall be made through eccentric reducing fittings. Eccentric reducers in horizontal runs shall be installed with the straight side down for steam lines to maintain condensate drainage (unless otherwise indicated on the drawings).

Eccentric reducers in horizontal runs shall be installed with the straight side up for condensate lines to maintain air venting (unless otherwise indicated on the drawings).

3.3.5 Branch Connections

Branches from mains shall branch off top of mains, as indicated or as approved. Connections shall insure unrestricted circulation, elimination of air pockets, and shall permit the complete drainage of the system. Branch connections providing service to and from buildings shall use standard tee fittings with standard reducers as needed for connections larger than 1 inch.

3.4 AIR VENTS

Steam and condensate air vents shall be installed at all high points in the piping system, at piping offsets where air can collect, and where shown on the drawings. The vent shall be piped to discharge outside. A manual isolation valve shall be installed just before the air vent.

3.5 PIPE INSERTS AND SUPPORTS

3.5.1 Pipe Supports in Utilidors and Valve Manholes

Horizontal and vertical runs of pipe in utilidors and valve manholes shall be securely supported. All pipe supports including the structural cross support member shall be hot-dip galvanized in accordance with SECTION 05500 MISCELLANEOUS METAL.

3.5.2 Pipe Supports

Supports shall be designed to prevent the accumulation or provide for the drainage of liquid where water lines and sewer lines are placed on the same support. The maximum spacing between pipe supports for straight runs shall be as follows unless a lesser amount is recommended by the pipe and/or coupling manufacturer. The Contractor shall submit design calculations showing the adequacy of the pipe support system.

Nominal Pipe Size (inches),

	1/2 to 1	1-1/4	1-1/2	2	2-1/2	3	4	6	8	10	12 and over
Max. Span, Feet	7	7	9	10	10	10	10	10	10	20	20

Nominal Tubing Size, Inches	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4 and over
Max. Span, Feet	5	5	6	7	8	8	9	10	10

Pipe supports shall be spaced not over 5 feet apart at heavy fittings and valves. Pipe shall be supported near each coupling and at multiple fittings as required. A support shall be installed not over 1 foot from

each change in direction of piping. Straight runs of pipe over 15 feet supported on beams or brackets shall be provided with a cylinder type alignment guide with a guide spider attached to the pipe. No supports shall be suspended from removable manhole tops or removable utilidor lids. Pipes shall be supported near each coupling or joint to prevent vertical deflection of the coupling or joint, as recommended by the pipe manufacturer. Pipes shall be secured to each horizontal support in utilidors to limit side-to-side and vertical movement but not axial movement (U-bolts or equal shall be used). Pipe rollers shall conform to MSS SP-58 and MSS SP-69 type 41, 44 or 46. Pipe rollers shall be one-piece cast iron type rollers. Split two-piece and aluminum rollers shall not be allowed. Teflon slide plate type supports shall not be allowed. All pipe hangers and supports shall be hot-dip galvanized after fabrication to provide a Coating Grade of 65 (average zinc coating of 1.5 ounces/square foot) in accordance with ASTM A 123/A 123M.

3.5.3 Pipe Racks

For pipe racks, 1-5/8 inch wide continuous slotted channels (Unistrut, or equal) shall be used, in accordance with SECTION 02560 UTILIDOR SYSTEM. As an alternative, the pipe support system may be an engineered system stamped and signed by a registered professional engineer, in accordance with SECTION 02560 UTILIDOR SYSTEM.

3.6 WELDING

Welding and radiographic examination of all steel carrier pipe welds shall be as specified in SECTION 05093 WELDING PRESSURE PIPING. Structural members shall be welded in accordance with SECTION 05090 WELDING, STRUCTURAL.

3.7 RADIOGRAPHIC TESTING

Radiographic examination of field welds in the steel carrier piping of the
heat distribution system shall be in accordance with ASME B31.1 performed as specified in SECTION 05093 WELDING PRESSURE PIPING. An approved independent testing firm or firms regularly engaged in radiographic testing shall perform the radiographic examination of field welds in the steel carrier piping of the heat distribution system in accordance with ASME B31.1. The Contractor shall furnish a set of films showing each weld
inspected, a reading report evaluating the quality of each weld, and a location plan showing the physical location where each weld is to be found
in the completed project, prior to backfilling and hydrostatic testing. All radiographs shall be reviewed and interpreted by a Certified Level III
Radiographer employed by the testing firm whose signature shall appear on the reading report. The Contracting Officer reserves the right to review all inspection records, and if any welds inspected are found unacceptable they will be removed, rewelded, and radiographically examined at no cost to the Government.

3.8 INSULATION

The insulation shall be installed in such a manner that it will not be damaged by pipe expansion or contraction. Insulation installed over welds shall be grooved to assure a snug fit. Where, applicable,

insulation shall be held in place with aluminum jackets and stainless steel straps. A minimum of 2 bands shall be installed on each individual length of insulation and maximum spacing shall not exceed 18 inch centers.

3.8.1 Installation

Material shall be installed in accordance with published installation instructions of the manufacturer. Insulation materials shall not be applied until piping tests are completed.

3.8.1.1 Preparation

Prior to application, surfaces shall be thoroughly cleaned of moisture, grease, dirt, rust, and scale. Insulation manufacturer's published installation instructions shall be followed.

3.8.1.2 Thickness

The minimum thickness of insulation for the heat distribution system and condensate return system shall be in accordance with Tables 1 and 2. The insulation thickness, where required, for steam trap and steam trace piping shall be 1/2 inch.

TABLE 1

Minimum Pipe Insulation Thickness (inches)

For steam piping 16 psig to 250 psig and high temperature hot water supply and return piping up to 450 degrees F

Nominal Pipe Diameter (in.)	Insulation Thermal Conductivity (k)		
	k less than 0.29	k from 0.29 to 0.40	k greater than 0.40
1.0	1.0	1.0	1.0
1.5	1.0	1.0	1.0
2.0	1.0	1.0	1.5
2.5	1.0	1.0	1.5
3.0	1.0	1.5	1.5
4.0	1.0	1.5	1.5
5.0	1.5	1.5	2.0
6.0	1.5	2.0	2.0
8.0	1.5	2.0	2.0
10.0	2.0	2.0	2.5
12.0	2.0	2.5	2.5
14.0	2.0	2.5	2.5
16.0	2.5	2.5	3.0
18.0	2.5	3.0	3.0
20.0	2.5	3.0	3.5
22.0	3.0	3.5	4.0
24.0	3.0	3.5	4.0

NOTE: Insulation thermal conductivity (k-value) is in units of Btu-inches/hour-square feet-degrees F at 200 degrees

TABLE 1

Minimum Pipe Insulation Thickness (inches)

For steam piping 16 psig to 250 psig and high temperature hot water supply and return piping up to 450 degrees F

Nominal Pipe Diameter (in.)	Insulation Thermal Conductivity (k) k less than 0.29	k from 0.29 to 0.40	k greater than 0.40

F mean temperature.

TABLE 2

Minimum Pipe Insulation Thickness (inches)

(For low pressure (less than 16 psig) steam, condensate return, and low temperature (less than 250 degrees F) hot water supply and return piping.)

Nominal Pipe Diameter (in.)	Insulation Thermal Conductivity (k) k less than 0.29	k from 0.29 to 0.40	k greater than 0.40
1.0	0.5	0.5	1.0
1.25	0.5	1.0	1.0
1.5	1.0	1.0	1.0
2.0	1.0	1.0	1.0
2.5	1.0	1.0	1.5
3.0	1.0	1.5	1.5
4.0	1.5	1.5	1.5
5.0	1.5	1.5	1.5
6.0	1.5	1.5	2.0
8.0	1.5	2.0	2.0
10.0	2.0	2.0	2.0
12.0	2.0	2.0	2.0
14.0	2.0	2.0	2.5
16.0	2.0	2.0	2.5
18.0	2.0	2.5	2.5

NOTE: Insulation thermal conductivity (k-value) is in units of Btu-inches/hour-square feet-degrees F at 200 degrees F mean temperature.

3.8.2 Insulation on Pipes Passing Through Sleeves

Insulation shall be continuous through sleeves as shown. Aluminum jackets shall be provided over the insulation. When penetrating building or utilidor walls, the aluminum jacket shall extend not less than 2 inches beyond the sleeve on each side of the wall and shall be

secured with an aluminum band on each side of the wall. Where flashing is provided, the jacket shall be secured with one band not more than 1 inch from the end of the jacket.

3.8.3 Covering of Insulation in Utilidors and Valve Manholes

The insulation for pipe, flanges, and fittings in utilidors and manholes shall be covered with aluminum or nonmetallic jackets as required for the insulation type in the paragraph INSULATION AND JACKETING.

3.9 VALVE MANHOLES AND ACCESSORIES

Valve manholes shall be field constructed, reinforced concrete type with access hatches.

3.9.1 Valve Manhole Construction and Accessories

The valve manholes shall be constructed of reinforced concrete conforming to SECTION 03300 CAST-IN-PLACE STRUCTURAL CONCRETE and in accordance with SECTION 02560 UTILIDOR SYSTEM.

3.9.1.1 Piping and Equipment in Valve Manholes

Piping in valve manholes shall be installed and supported as shown on the drawings. All globe, angle and gate valves shall be installed with the stems horizontal or above.

3.9.1.2 Sump Pumps Installation

Sump pumps shall be installed as indicated. Pumps shall be connected to a dedicated electrical service. All electrical connections shall be hard wired.

3.10 UTILIDOR SYSTEM

A concrete cast-in-place utilidor system shall be provided and installed with a removable top as shown on the drawings.

3.10.1 Concrete

Materials and methods for mixing and placing of concrete shall be as specified in SECTION 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

3.10.2 Coordination with Existing Utilities

Before beginning work in a given area, all utility information shall be field verified by surface markings made by the affected utility Owner's Representative. Contractor shall notify the Contracting Officer in advance, and receive prior approval before excavating in any areas. The actual utilidor routing may be offset or changed if approved by the Contracting Officer in order to reduce conflicts, interruptions, expedite the work, or for any other reason to the mutual benefit of the Contractor and the Government. Utility conflicts may be cast into the floor of the utilidor providing they do not interfere with the utilidor drainage and are approved by the Contracting Officer.

3.10.3 Piping Support System

Piping shall be supported as specified in SECTION 02560 UTILIDOR SYSTEM.

3.10.4 Pipe Expansion

The expansion of pipes shall be provided for by changes in the direction of the run of pipe, by expansion loops, or by expansion joints, as indicated. Externally pressurized guided type expansion joints shall be used for steam and low to medium temperature water systems only and shall be installed where indicated. The joints shall provide for single and or double slip of the connected pipes as indicated and for the traverse indicated. The joints shall be designed for a working temperature and pressure suitable for the application and in no case less than 100 psig. The joints shall be in accordance with applicable requirements of EJMA Stds and ASME B31.1. End connections shall be flanged, unless otherwise indicated on the drawings. Anchor bases or support bases shall be provided as indicated or required. Initial setting shall be made in accordance with the manufacturer's recommendations to allow for ambient temperature at time of installation. Pipe in the loops and bends shall accommodate expansion while maintaining required insulation clearance from floors, walls, tops, and other pipes to avoid crushing or breaking of insulation. Expansion loops may be designed around obstacles such as utility manholes, structures, or trees to avoid construction conflicts. Slopes of pipe and utilidor bottoms shall be maintained. Contractor shall have the option to adjust the loop dimensions around obstacles based on final field measurements if approved by the Contracting Officer. Contractor shall submit pipe stress calculations for each revised expansion loop or bend based on the final actual measured lengths, or shall submit dimensions to the Contracting Officer for verification of loop and bend sizes before proceeding with that segment of work. Allowable pipe stresses shall be in accordance with ASME B31.1. Final expansion loop insulation method shall be submitted for approval to the Contracting Officer. Pipe alignment guides shall be installed as recommended by the joint manufacturer, but in any case shall be not more than 5 feet from expansion joint, except in lines 4 inches or smaller where guides shall be installed not more that 2 feet from the joint.

3.10.5 Pipe Anchors

Pipe anchors in manholes and utilidors shall be of welded construction, designed by the Contractor. The number and approximate location of anchors is indicated on the contract drawings. Shop drawings indicating anchor locations and details of design, including calculations, shall be submitted for Government Approval. Shop drawing approval shall be obtained prior to placing any piping. The range of anticipated pipe temperatures, which shall be used to determine the design forces on anchors, is from 32 degrees F to a potential operating temperature as indicated on the drawings. Pressures for calculating forces are as follows: Working pressure of 85 psig and a test pressure of 200 psig. If expansion anchors are used in lieu of cast in place anchor bolts, an additional safety factor of 1.5 shall be used in sizing the anchor bolts. No supports, anchors, or stays shall be attached in places where they may cause damage during installation or by the weight or expansion of the pipe. All steel shapes shall conform to ASTM A 36/A 36M. The type and class shall be the Contractor's option. For finishing, see SECTION 02560 UTILID0R SYSTEM, paragraph PAINTING AND FINISHING. Additionally, any anchor that is supported from the manhole or utilidor bottom shall have the lower 6 inches of the anchor protected with two layers of coal-tar coating. Anchors shall be attached to pipes by welding.

3.11 TESTS

Tests shall be conducted before, during, and after the installation of the system. All instruments, equipment, facilities, and labor required to properly conduct the tests shall be provided by the Contractor.

3.11.1 Control Valves and PRV Stations

Prior to cleaning of piping and the hydro-static and operating tests, the Contractor shall install 100 mesh screens in the strainers of all control valve assemblies and PRV (pressure reducing valve) stations for all affected facilities. Facilities shall include building mechanical rooms and steam trace lines. The Contractor shall save the original existing strainer screens. The Contractor shall replace the original existing strainer screens no less than 2 months after that section of utilidor has been placed back in operation.

3.11.2 Cleaning of Piping

Prior to the hydrostatic and operating tests, the interior of the piping shall be flushed with clean water until the piping is free of all foreign materials. Flushing and cleaning out of system pipe, equipment, and components shall not be considered completed until witnessed and accepted by the Contracting Officer. After flushing the system is completed, the system shall be drained and filled with clean water. Temporary strainers shall be provided for all equipment and control valves to prevent clogging in accordance with the previous paragraph.

3.11.3 Test Pressure Gauges

Test pressure gauges for a specific test shall be approved by the Contracting Officer and shall have dials indicating not less than 1-1/2 times, nor more than 3 times the test pressure. All test gauges used for reading test pressures shall have been calibrated annually and traceable to a nationally recognized standard. When the test gauge is used for pressure testing no more than twelve months shall have elapsed since the last calibration. The contractor shall have documented evidence of calibration of the test pressure gauge available for review by the COR. A check gauge shall be installed on the test apparatus. The check gauge shall be installed during the pressure test and shall read within 2 psi of the test gauge. If the difference in readings exceeds 4 psi, one gauge shall be recalibrated.

3.11.4 Field Tests

The following field tests shall be conducted when applicable to the system involved. If any failures occur, the Contractor shall make such adjustments or replacements as the Contracting Officer may direct, and the tests shall be repeated until satisfactory tests are completed.

3.11.4.1 Hydrostatic Tests of Service Piping

Service piping shall be tested hydrostatically before insulation is applied at field joints, and shall be proved tight at a pressure 1-1/2 times the working pressure of 85 psig or at 200 psig, whichever is greater. Hydrostatic test pressure shall not exceed 500 psig. Hydrostatic test pressures shall be held for a minimum of 4 hours. If the hydrostatic test pressure cannot be held, the Contractor shall make

such adjustments or replacements and the tests repeated until satisfactory results are achieved.

3.11.4.2 Equipment Tests

All pumps, valves, traps, alarms, controls, and any other operable item of equipment shall be operated to verify proper operation and compliance with the specifications. Pump voltage, current, and discharge readings shall be recorded and submitted for approval in accordance with submittal Tests.

3.11.4.3 Insulating Flange Test

Insulating flanges shall be tested for electrical isolation in accordance with the insulating flange manufacturer's standard test. This test shall be witnessed and approved by the Contracting Officer.

3.11.4.4 Operational Tests

After installation of the utilidor system, or testable portion thereof, operational tests shall be conducted. The utilidor covers shall not be placed prior to completion of operational tests. Operational tests shall consist of operating the system at the pressure and temperature expected for the system when in normal service, and shall demonstrate satisfactory operating effectiveness. The test on each system, or portion thereof, shall last a minimum of 24 hours.

3.11.4.5 Utilidor Water Removal Tests

After the above tests are completed, and before the utilidor and valve manhole covers are placed, the utilidors, sumps, and valve manholes shall be cleaned of dirt and debris. The utilidor system shall be tested to ensure gravity drainage of water is maintained in the utilidor bottom from high points to drained low points. Contractor shall verify water does not pond between high and low points, and that drained low points are operational either by use of sump pumps or by gravity drainage to storm drains, as indicated. Test shall not be considered completed until witnessed and accepted by the Contracting Officer. The utilidor tops shall be placed and sealed immediately after approval by the Contracting Officer.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02560

UTILIDOR SYSTEM

PART 1 GENERAL

1.1 REFERENCES
1.2 GENERAL REQUIREMENTS
1.2.1 Winter Heating Requirement
1.2.2 Nameplates
1.2.3 Verification of Dimensions
1.2.4 Steam, Water, and Sewerage Facilities
1.2.5 Site Work
1.2.5.1 Excavation, Trenching, Filling and Backfilling
1.2.5.2 Relocation of Interferences
1.2.5.3 Modifications to Existing Facilities
1.2.6 Standard Products
1.3 SUBMITTALS
1.4 SUBMITTALS SUPPLEMENT
1.4.1 Detail Drawings
1.4.2 Fabrication and Erection Drawings
1.4.3 Schedules of Work and Tests Required for Installation
1.4.4 Manufacturer's Catalog Data
1.4.5 Materials
1.4.6 Waterproofing Material
1.4.7 Operation and Maintenance Manuals
1.5 CONCRETE WORK
1.5.1 Concrete
1.6 PIPE INSERTS, ANCHORS AND SUPPORTS
1.6.1 Pipe Seismic Bracing

PART 2 PRODUCTS

2.1 COATINGS AND SEALANTS
2.1.1 Coal Tar Coating
2.1.2 Asphalt Varnish
2.1.3 Utilidor Lid Seal
2.1.4 Sealant
2.1.4.1 Primer
2.1.4.2 Backstop Material
2.1.5 Zinc Oxide Primer
2.1.6 Galvanized Coating
2.2 INSULATION
2.2.1 Extruded Polystyrene
2.3 WATERPROOFING
2.3.1 Asphalt
2.3.2 Coal-Tar
2.3.3 Primer
2.4 CONSTRUCTION FABRIC
2.5 STEEL AND MISCELLANEOUS METAL
2.6 SUPPORT RACK AND INSERT SYSTEM
2.6.1 Pipe Rollers

PART 3 EXECUTION

3.1 MANHOLES AND ACCESSORIES
3.1.1 General
3.1.2 Manhole Construction and Accessories
3.1.2.1 Dimensions
3.1.2.2 Manhole Ladders
3.1.2.3 Fire Hydrant Manhole Frames and Covers
3.1.2.4 Manhole Doors
3.1.2.5 Manhole Vents
3.2 CONCRETE UTILIDOR SYSTEM
3.2.1 General
3.2.2 Concrete Utilidor Lids
3.2.3 Concrete Utilidor Construction
3.2.4 Final Elevations
3.2.5 Coordination With Existing Utilities
3.3 PIPE SLEEVE REQUIREMENTS
3.4 PIPE SUPPORT RACK
3.5 WATERPROOFING
3.5.1 Delivery and Storage
3.5.2 Preparation
3.5.3 Waterproofing
3.5.3.1 Bituminous Waterproofing
3.5.3.2 Urethane Industrial Membrane System
3.5.3 Equipment Calibration (For Two-Component Systems Only)
3.6 PAINTING AND FINISHING
3.6.1 Ferrous Metal Surfaces Inside Utilidors and Manholes
3.6.2 Ferrous Metal Surfaces Outside Manholes
3.7 INSULATION
3.7.1 Requirements
3.7.2 Installation of Insulation
3.7.2.1 Exterior Surfaces
3.8 QUALITY PROVISIONS
3.8.1 General
3.8.2 Field Tests
3.8.2.1 Equipment
3.8.3 Heating and Temperature Monitoring Plan
3.9 CLEANING OF UTILIDOR SYSTEM

-- End of Section Table of Contents --

SECTION 02560

UTILIDOR SYSTEM

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A 123	(2000) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 153	(2000) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 36	(2000a) Carbon Structural Steel
ASTM A 570/A 570M	(1998) Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality
ASTM A 780	(2000) Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM B 633	(1998) Electrodeposited Coatings of Zinc on Iron and Steel
ASTM C 578	(1995) Rigid, Cellular Polystyrene Thermal Insulation
ASTM C 920	(2001) Elastomeric Joint Sealants
ASTM D 1777	(1996) Measuring Thickness of Textile Materials
ASTM D 41	(1984; R 2000) Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
ASTM D 43	(2000) Coal Tar Primer Used in Roofing, Dampproofing, and Waterproofing
ASTM D 449	(1989; R 1999) Asphalt Used in Dampproofing and Waterproofing
ASTM D 450	(1996; R 2000) Coal-Tar Pitch Used in Roofing, Dampproofing and Waterproofing
ASTM D 5034	(1995) Breaking Force and Elongation of Textile Fabrics (Grab Test)
ASTM D 751	(2000) Coated Fabrics

INTERNATIONAL CODE COUNCIL (ICC)

IBC 2000	International Building Code 2000

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS SP-58	(1993) Pipe Hangers and Supports - Materials, Design and Manufacture
MSS SP-69	(1996) Pipe Hangers and Supports - Selection and Application

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS A-A-60005	(1998) Frames, Covers, Gratings, Steps, Sump and Catch Basin, Manhole Castings
CID A-A-1632	(Basic) Varnish, Asphalt
FS TT-S-001543	(Rev. A) Sealing Compound: Silicone Rubber Base (For Calking, Sealing, and Glazing in Buildings and Other Structures)

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC Paint 25	(1997) Oxide, Zinc Oxide, Raw Linseed Oil and Alkyd Primer (Without Lead or Chromate Pigments).

1.2 GENERAL REQUIREMENTS

1.2.1 Winter Heating Requirement

When the ambient air temperature is below 32 degrees F, the utilidor sections and manholes shall be heated. All temperatures shall be constantly and adequately monitored. The Contractor shall submit its heating and monitoring plan as detailed in paragraphs QUALITY PROVISIONS and SUBMITTALS. For the purposes of this paragraph, "backfilled" shall mean that insulation, if required, has been installed and backfill has been placed as directed by contract plans and specifications up to within 3 inches of the top of the structure's walls. This requirement shall apply to both new utilidors and manholes, and existing utilidors and manholes that have work under this contract.

a. When the utilidor sections or manholes are insulated and backfilled, the structures shall be heated such that the minimum inside air temperature at all locations is 40 degrees F.

b. When the utilidor sections or manholes are not backfilled, the entire structure, to include air spaces and all external surfaces and unbackfilled trench areas within 3 lineal feet of the structure's walls, shall be heated to 40 degrees F minimum.

c. Any utilidor system not included in this contract but connected to utilidors having work under this contract shall be heated as described above. The extent of this heating shall include all areas that are disturbed under this contract. "Disturbed" shall include

excavation or any other work that alters the thermal regime and exposes the utilidor and/or manholes to freezing temperatures.

1.2.2 Nameplates

Each major item of equipment shall have the manufacturer's name, address, type or style, and model or serial number on a plate secured to the item of equipment.

1.2.3 Verification of Dimensions

The Contractor shall become familiar with all details of the work, verify all dimensions in the field, and shall advise the Contracting Officer of any discrepancy before performing any work.

1.2.4 Steam, Water, and Sewerage Facilities

All steam, water and sewerage facilities and all other work required to be installed in the completed utilidors as called for by the drawings or specifications shall be furnished and installed in accordance with the applicable provisions of other sections of these Specifications.

1.2.5 Site Work

1.2.5.1 Excavation, Trenching, Filling and Backfilling

Excavation, trenching, filling and backfilling shall be as hereinbefore specified in SECTION 02300 EARTHWORK of these specifications. The utilidors shall be constructed to the grades as required by the drawings.

1.2.5.2 Relocation of Interferences

Interferences as indicated, or as found during construction, shall be removed or relocated as necessary. Relocations shall be as indicated or as approved by the Contracting Officer. Examples of interferences are:

a. Power and Communication lines;

b. Fences and sidewalks;

c. Utilidors.

1.2.5.3 Modifications to Existing Facilities

Modifications shall be made as indicated. Examples of modifications are:

a. Removal and replacement of street or parking area pavements.

b. Re-construction of existing manholes.

c. New utility distribution piping entrances to buildings, manholes, or utilidors.

Any other modifications shall be made as required for complete installation of the utilidor system as indicated.

1.2.6 Standard Products

The equipment to be furnished under this specification shall be

essentially the standard product of the manufacturer. Where two or more units of the same class of equipment are required, these units shall be the products of a single manufacturer; however, the component parts of the system need not be the products of the same manufacturer. The products of any reputable manufacturer regularly engaged in the commercial production of required equipment will not be excluded on the basis of minor differences, provided all essential requirements of this specification relative to materials, capacity and performance are met.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Heating and Temperature Monitoring Plan

SD-02 Shop Drawings

Detail Drawings; G, EN-TE-CS

Fabrication and Erection Drawings

SD-03 Product Data

Schedules of Work and Tests Required for Installation

Manufacturer's Catalog Data

SD-04 Samples

Materials

SD-05 Design Data

Steel Strut Pipe Support System Design Calculations

Seismic Bracing Calculations

SD-08 Manufacturer's Instructions

Waterproofing Material

SD-10 Operation and Maintenance Data

Operation and Maintenance Manuals; G

1.4 SUBMITTALS SUPPLEMENT

See paragraphs below for further descriptions (when available) of submittals required by paragraph SUBMITTALS:

1.4.1 Detail Drawings

Fabrication and assembly drawings of work in sufficient detail to verify

compliance with the contract for the following:

a. Sump Pumps

b. Precast or Site-Cast Concrete Utilidor Lids

c. Manholes to include Sumps and Vents

d. Utilidor Construction

e. Alarm Lights and posts

f. Catwalks

g. Manhole expansion and reconstruction

h. Steel pipe support, seismic bracing, and anchorage system

i. Temporary and permanent cut-off walls.

h. Details of piping and fitting transitions between awarded options and existing piping to remain

1.4.2 Fabrication and Erection Drawings

At least 30 days prior to casting any units, the Contractor shall submit complete fabrication and erection drawings and placement diagrams, and shall submit such other descriptive data as the Contracting Officer may require to demonstrate compliance with the contract requirements. The submittal shall also include the Contractor's proposed methods of curing and storing the units in the casting yard and complete details of its method of casting, handling, transporting, and erecting the units, including type and location of lifting devices. Fabrication and erection drawings shall contain plans showing the size and location of every blockout required for any opening in each unit. Openings include those necessary for mechanical or electrical work, or any other major physical interference. Fabrication and erection drawings shall include drawings showing placement of pipe supports, seismic bracing, alignment guides and anchors for manholes and utilidor sections. Fabrication and erection drawings and placement diagrams for all units shall be submitted at one time. No casting operations shall commence at a permanent or temporary on- or off-site fabrication plant until fabrication and erection drawings and placement diagrams have been received by the Contracting Officer.

1.4.3 Schedules of Work and Tests Required for Installation

1.4.4 Manufacturer's Catalog Data

Catalog cuts, brochures, and product data verifying compliance with the contract for the following:

a. Insulation adhesive.

b. Insulation material.

c. Sealants

1.4.5 Materials

Representative samples in the following quantities:

a. Urethane Membrane: 1 gallon

b. Construction Fabric: 1 square yard

1.4.6 Waterproofing Material

Manufacturer's installation instructions and certificate of compliance shall be submitted before delivery of materials to the site. For bitumen, instructions shall specify acceptable range of bitumen application temperatures and the maximum temperature for holding bitumen in a heated condition.

1.4.7 Operation and Maintenance Manuals

Provide 4 sets of O + M Manuals 1 set shall be on compact disc.

1.5 CONCRETE WORK

1.5.1 Concrete

Concrete shall be as specified in SECTION 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

1.6 PIPE INSERTS, ANCHORS AND SUPPORTS

Pipe inserts, anchors and supports for all systems shall be as specified in SECTION 02511 WATER DISTRIBUTION SYSTEMS IN UTILIDORS except that those for the steam system are specified in SECTION 02559 HEAT DISTRIBUTION SYSTEMS IN UTILIDORS AND MANHOLES. The steel strut support system for the piping shown in the plans is generic only. The Contractor shall submit design calculations and shop drawings for the steel strut system and seismic bracing system. Sewer pipe supports must be designed so that the elevation of the pipe can be adjusted at each support point to compensate for seismic movement and settling in the future. Calculations shall be stamped and signed by an engineer registered in the State of Alaska.

1.6.1 Pipe Seismic Bracing

The Contractor shall design the pipe seismic bracing in accordance with IBC 2000. Resistance to lateral forces induced by earthquakes shall be accomplished without consideration of friction resulting from gravity loads. Bracing for the following equipment shall be developed by the Contractor: All of the utilidor piping and appurtenances and the steel strut pipe support system.

PART 2 PRODUCTS

2.1 COATINGS AND SEALANTS

2.1.1 Coal Tar Coating

The coal tar coating shall be a self-priming, heavy duty, cold-applied, water resistant coating made from pitch derived from suitable tars, selected solvents, mineral fillers and special additives. The material shall be able to protect against the deteriorating effects of raw and

industrial waste materials and hydrogen sulfide gas, and be suitable for application to all metal, concrete and board insulation surfaces which will be buried, immersed, or exposed. The coating shall be applied in accordance with the manufacturer's recommendations to include, but not limited to, priming and top coats. The coal tar coating shall be Bitumastic Super Service Black as manufactured by Carboline Company, or equal. Sealmastic No. 2 emulsion may be substituted and applied in accordance with manufacturer's recommendation.

2.1.2 Asphalt Varnish

Asphalt varnish shall conform to Federal Specification CID A-A-1632.

2.1.3 Utilidor Lid Seal

Surfaces of joints to be in contact with mastic shall be dry and free of oil, grease, dirt, loose concrete particles, or other foreign substances. Trowel on a generous layer of "Fibered Roof Coating", ATCO product #1818 or approved equal. Lay two runs of "Oakum" type filler material or 5/8 inch plastic closed cell backer rod on top of wall, into the mastic as shown on the drawings. All lifting loops, hooks, or eyes shall be nondeformed, ASTM A 36 galvanized steel unless a stronger steel or superior finish is shown on the drawings.

2.1.4 Sealant

Sealant for pipe sleeves shall conform to Federal Specification FS TT-S-001543. Sealant for utilidor shall conform to ASTM C 920, Type II, Class A. The compound shall be supplied in pre-measured kit form for on-the-job mixing.

2.1.4.1 Primer

Primer for sealant shall be as recommended by the sealant manufacturer. Primer shall have been tested for durability with the sealant to be used and on samples of the surfaces to be sealed.

2.1.4.2 Backstop Material

Backstop materials shall be resilient urethane or polyvinyl chloride foam, closed-cell polyethylene foam, closed-cell sponge of vinyl or rubber, polychloroprene tubes or beads, polyisobutylene extrusions, oilless dry jute, or rope yarn. Backstop material shall be nonabsorbent, nonstaining, and compatible with the sealant used. Tube or rod stock shall be rolled into the joint cavity.

2.1.5 Zinc Oxide Primer

Zinc oxide primer shall conform to SSPC Paint 25.

2.1.6 Galvanized Coating

Repair shall conform to ASTM A 780 for damaged and uncoated areas of hot-dip galvanized coating.

2.2 INSULATION

2.2.1 Extruded Polystyrene

Extruded polystyrene shall conform to ASTM C 578, Type IV. Exterior insulation for utilidors with traffic lids shall have the added requirement of 60 psi minimum compressive strength.

2.3 WATERPROOFING

2.3.1 Asphalt

ASTM D 449, Type II.

2.3.2 Coal-Tar

ASTM D 450, Type II.

2.3.3 Primer

ASTM D 41 for asphalt and ASTM D 43 for coal-tar pitch.

2.4 CONSTRUCTION FABRIC

Construction fabric shall meet the following requirements:

PROPERTY	DATA	TEST METHOD
Thickness, mils, min.	100	ASTM D 1777
Mullen Burst Strength, psi, min.	400	ASTM D 751 Diaphragm Method
Trapezoidal Tear Strength, lbs., min.	90	ASTM D 751
Puncture Resistance, lbs., min.	120	ASTM D 751
Elongation at 250 lb. Load, percent, max.	150	ASTM D 5034

2.5 STEEL AND MISCELLANEOUS METAL

Steel and miscellaneous metal not otherwise specified shall conform to SECTION 05500, MISCELLANEOUS METALS.

2.6 SUPPORT RACK AND INSERT SYSTEM

Steel strut system supports shall be manufactured from ASTM A 570/A 570M, Grade 33, 12 gauge hot dipped galvanized steel in accordance with ASTM A 123. System shall be rated for a minimum 1500 lb point loading. To inhibit concrete seepage in concrete inserts system shall include closure and end caps or foam filler. Strut system shall be coordinated with and accommodate pipe rollers as specified. Supports and anchors in utilidors and manholes that rest on the utilidor or manhole bottom shall be protected with two coats of coal-tar coating or equal applied to a minimum of the lower 12 inches of the support. Scratches and chips in the coating acquired during transport or installation shall be re-coated.

2.6.1 Pipe Rollers

Pipe rollers shall conform to MSS SP-58 and MSS SP-69 type 41, 44 or 46.

Pipe rollers shall be one-piece cast iron type rollers. Split two-piece and aluminum rollers shall not be allowed. Teflon slide plate type supports shall not be allowed.

PART 3 EXECUTION

3.1 MANHOLES AND ACCESSORIES

3.1.1 General

New manholes shall be field constructed, reinforced concrete type. Existing manholes shall be modified as shown on the drawings. Where connections to existing utilidors or manholes are required, the Contractor shall break open the utilidor or manhole to the minimum extent necessary for adequate tying of the new construction to the old. All steel bars shall be thoroughly cleaned before placing any concrete. Before any new concrete is placed against the old concrete, the surface of the latter shall be cleaned of all debris and loose material and a coating of neat cement grout applied just prior to placing the new concrete. No structures and/or appurtenances shall be supported from manhole tops other than the access ladder, electrical hardware, and any structure specifically shown on the drawings as being supported from the manhole tops.

3.1.2 Manhole Construction and Accessories

The manholes shall be constructed of reinforced concrete. Manhole side walls shall be constructed by one monolithic pour.

3.1.2.1 Dimensions

Manhole dimensions shall be as indicated and in all cases shall provide sufficient room for maintenance equal to or greater than the pipe spacing shown in the drawings. Manhole sumps shall be 2 feet deep by 2 feet in diameter unless shown otherwise. At the Contractor's option, the sump may be a 2 feet deep by 2 feet square. At the Contractor's option, the sump may be a Schedule 40 steel pipe, 26 inches in diameter. The pipe shall be closed at the bottom by either a 0.5 inch steel plate or a 4 inch thick, reinforced concrete base. The pipe shall be locked into manhole floor and PCC base. The finished depth of the sump shall be 2 feet. The pipe sump shall be coated with a coal tar coating.

3.1.2.2 Manhole Ladders

Manholes shall be provided with straight-type steel ladder(s) not less than 16 inches in width with 7/8-inch diameter rungs spaced 12 inches apart. Bar side rails shall be 2 inch x 1/2 inch steel. The ladder shall be adequately anchored to the wall by means of steel inserts spaced not more than 6 feet apart vertically, or as shown on the drawings, and shall be so installed as to provide at least 6-1/2 inches of toe space between the wall and the inside of the rungs. When the inside of the manhole is insulated, the 6-1/2 inch spacing shall be between the insulation and the inside of the rungs. The wall along the line of the ladder shall be vertical its entire height. Ladders anchored to manhole bottoms shall have the bottom 12 inches covered with coal tar coating.

3.1.2.3 Fire Hydrant Manhole Frames and Covers

Frames and covers shall be of the solid lid type and conform to the applicable portions of Federal Specification FS A-A-60005. Frames and covers shall:

a. Have a minimum masonry contact of 3 inches overlap.

b. Be constructed of ductile iron or gray iron.

c. Have a clear access of 24 inches or as indicated on the drawings.

d. Have hatches covered with one round lid.

e. Have external (non-recessed) butt-type hinges securely attached to the frame that shall not work loose under repeated opening and closing of the lids.

f. Have fixed protruding handle with a minimum clear hand opening of 5 inches by 2 1/2 inches.

Frames and covers shall be proof-load tested in accordance with Federal Specification FS A-A-60005. Loading shall be for 1,000 pounds. Frames and covers shall be R-6320-E as manufactured by Neenah Foundry Company of Neenah, WI, as modified above, or equal.

3.1.2.4 Manhole Doors

Door Lids with frames shall be Aluminum "Bilco Type J-AL or JD-AL" vault doors or approved equal, dimensioned as shown on drawings. The vault access shall be single leaf, pre-assembled from the manufacturer. Doors shall fit into the existing access hatch and shall be fastened with 3/8 inch expansion anchors drilled and fastened into existing frame and concrete.

a. Lifting mechanisms: Doors shall have the required number and size of compression spring operators enclosed in telescopic tubes to provide, smooth, easy and controlled cover operation though the entire arc of opening and to act as a check in retarding downward motion of the cover when closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly.

b. A removable exterior turn/lift handle with a spring loaded ball detent shall be provided to open the cover and the latch release protected by a flush, gasketed, removable screw plug.

c. Cover shall be equipped with a steel hold open arm which automatically locks the cover in the open position.

d. Compression spring tubes shall be an anti-corrosive composite material, hinges and steel snap lock shall be Type 316 stainless steel.

3.1.2.5 Manhole Vents

Manholes shall be provided with two natural convection style vents located at opposite corners. Vents shall be constructed of minimum 8-inch diameter, Schedule 40 pipe, capped and rise a minimum 36" above exterior finished grade. One vent shall draw from approximately 6 inches below manhole ceiling and the other from 12 inches above manhole

floor. Vents shall be provided with a manual damper located inside the manhole. The vent pipe shall be painted in accordance with SECTION 09900 PAINTS AND COATINGS, additionally, the buried portion of the pipe shall be also be coated with coal-tar coating or equal.

3.2 CONCRETE UTILIDOR SYSTEM

3.2.1 General

A concrete utilidor system shall be provided and installed with removable lids as shown in detail on the drawings. Lids for utilidors in general shall be precast. The walls and floor slabs shall be either monolithic construction, placed with construction joints between bottom and sides or placed with construction joints between sides and a starter wall cast into the bottom. No structures and/or appurtenances shall be supported from the utilidor lids.

3.2.2 Concrete Utilidor Lids

Concrete utilidor lids shall be flat and true at all locations where contact on utilidor wall is to be made. Concrete utilidor lids with defects which affect the strength of the cover unit, or which are warped, honeycombed, contain visible air pockets, exposed aggregate or other surface defects such as spalled, chipped or broken edges shall not be installed. Handling and conveying before curing shall be reduced to a minimum by use of methods designed to prevent bending or shock likely to produce incipient cracks or other deformities. All lifting loops or eyes shall be nondeformed, ASTM A 36 galvanized steel unless a stronger steel or superior finish is shown on the drawings.

The joint where the sides of the utilidor top meets the utilidor lid shall be thoroughly cleaned, dry, free of oil, grease, dirt, loose concrete particles, or other foreign substances. Trowel on a (approximately 1/4" high by 4" wide) layer of "fibered Roof Coating", ATCO product #1818, or equal. Lay two runs of "Oakum" type filler or 5/8" closed cell backer rod material on top of wall, into the mastic.

3.2.3 Concrete Utilidor Construction

The concrete utilidor system shall be of various sizes to accommodate the different piping arrangements as indicated. The concrete utilidor wall top dimensions are critical to provide a tight fitting system. Contractor shall use extreme caution when forming and placing inside edge and top of walls to provide smooth even surfaces to accommodate utilidor lids.

3.2.4 Final Elevations

The concrete utilidor floor shall slope continuously and drain toward manholes. The Contractor shall set the concrete utilidor at the elevation shown on the drawings and shall grade the adjacent areas. Any cut or fill areas adjacent to the concrete utilidor shall be graded back to the existing grade at a 2 percent slope or as indicated. There shall be no surface depressions which might prevent free surface drainage away from the utilidor. Final elevations shall be approved by the Contracting Officer. Once the final elevation is set, the concrete utilidor floor and piping must maintain constant slope to drain toward a manhole.

3.2.5 Coordination With Existing Utilities

Before beginning work in a given area, the Contractor shall become familiar with all known utility locations shown and expose those existing underground utilities to verify existing conditions to determine any conflicts with the work, and to plan his work accordingly. The actual concrete utilidor routing may be offset or changed if approved by the Contracting Officer in order to reduce conflicts, interruptions, expedite the work, or for any other reason to the mutual benefit of the Contractor and the Government.

3.3 PIPE SLEEVE REQUIREMENTS

Pipes and conduits passing through concrete walls, floors, or tops shall be provided with pipe sleeves fitted into place at the time of construction. The space between the pipe and sleeve shall be filled with back-up material and sealed flush with both inside and outside surfaces with a 3/8-inch deep bead of sealant. Sleeves shall not be installed in structural members, except where indicated or approved. Each sleeve shall extend through its respective wall, floor or top, and shall be cut flush with each surface, except for special circumstances. Unless otherwise indicated, sleeves shall be of size to provide a minimum of 1/4-inch clearance all-around between bare pipe and inside of sleeve or between jacket over insulation and sleeves. Sleeves shall be steel pipe, cast-iron pipe, or ductile iron pipe.

3.4 PIPE SUPPORT RACK

Pipe racks in utilidors shall be 1-5/8 inch wide continuous slotted channels (Unistrut, or equal), metal framing systems, using nut and bolt connections of fittings and hardware to the slotted channels. In new concrete construction, the wall supports shall be embedded in concrete. Pipe racks and support systems for sewer pipe shall be vertically adjustable in 1/2-inch increments up to 4 inches in each direction to allow elevation adjustments in the event of future settlement. The Contractor shall provide pipe rack configurations as necessary throughout the project, and shall include, in his shop drawing submittal, drawings with dimensions showing clearances from support members to piping systems, pipe rack dimensions, maintenance access aisle, components and fittings proposed for use. Bottom of supports shall not rest in drainage trench in utilidor bottom. Pipe support systems may not be suspended from removable utilidor or manhole lids.

3.5 WATERPROOFING

The below ground exterior of all concrete manhole and utilidor side and lids shall be waterproofed in accordance with this paragraph. Waterproofing shall extend a minimum of 2 feet beyond construction joints with existing utilidor and manholes. Waterproof all existing and new below ground manhole exposed in the course of constructing new access shafts, ceilings, and expanding existing manhole chambers. The utilidor walls exposed in the course of removing lids to access utilidor piping and all new utilidor shall also be waterproofed as described in this paragraph.

3.5.1 Delivery and Storage

Materials shall be delivered to the job site in their original unopened packages, clearly marked with the manufacturer's name, brand name, and

description of contents. Materials shall be stored in clean, dry areas, away from excessive heat, sparks, and open flame. Storage area shall be ventilated to prevent build-up of flammable gases. Materials shall be maintained at not less than 50 degrees F for at least 24 hours before use.

3.5.2 Preparation

Preparation of surfaces to be waterproofed shall be as specified in SECTION 03300 CAST-IN-PLACE STRUCTURAL CONCRETE. Items that penetrate the membrane shall be installed before waterproofing is applied. Surfaces shall be smooth and swept thoroughly to remove foreign materials immediately before waterproofing is applied.

3.5.3 Waterproofing

Waterproofing shall consist of the appropriate number of coatings of either bitumen or urethane membrane as specified herein.

3.5.3.1 Bituminous Waterproofing

a. Application: Waterproofing shall not be applied if frothing or bubbling occurs when hot bitumen is applied to the surface. The hot bitumen must stick tightly to the surface. When waterproofing in an enclosed space, adequate ventilation shall be provided. Waterproofing shall be one layer of primer and one layer of asphalt or coal-tar, applied in solid moppings. Waterproofing shall be applied when the ambient temperature is 40 degrees F or above. Asphalt shall not be heated above 450 degrees F nor coal tar above 375 degrees F. Heating kettles and tanks shall be provided with automatic thermostatic control capable of maintaining bitumen temperature. Temperature of bitumen at time of application shall be in accordance with the bitumen manufacturer's recommendation. Temperature shall be measured with portable thermometer at the point of application immediately before its use. Bitumen with a temperature not conforming to the manufacturer's recommendations shall be returned to the kettle. Bitumen overheated by more than 50 degrees F for more than 1 hour shall be removed from the site. Sealmastic No. 2 emulsion may be substituted and applied in accordance with manufacturer's recommendation.

b. Priming: Surfaces shall be coated uniformly with primer at the rate recommended by the manufacturer.

c. Projections and Flashing: All pipes, pipe sleeves, and other similar projections through the membrane shall be made watertight, and all flashings and similar construction shall be mopped thoroughly in place.

d. Coating: Coating shall be applied uniformly at the rate of not less than 60 pounds of asphalt or 70 pounds of coal-tar per square. Sealmastic No. 2 emulsion shall be applied in accordance with manufacturer's recommendation. Brooms shall have soft bristles and shall be discarded when bitumen buildup on the fibers prevents application of equal pressure across the broom width.

e. Protection: Waterproofing against which backfill is to be placed shall be protected by a single thickness of insulation board, unless insulated with polystyrene or cellular glass in accordance

with other sections of this specification. The insulation board shall be pressed into the final mopping while the bitumen is still hot, with edges of boards brought into moderate contact and joints staggered. Where surfaced insulation board is used, the surfaced side shall face outward. Boards shall be carefully and neatly fitted around projections and shall cover the entire surface of the waterproofing. Waterproofing not covered with insulation fiberboards shall be protected as necessary to prevent damage from subsequent building operations.

3.5.3.2 Urethane Industrial Membrane System

Installation shall comply with the manufacturer's instructions, except as otherwise specified. The membrane shall bond to concrete. Application shall be in two coats minimum with successive coats applied at right angles to the preceeding coat. Finished thickness of the membrane shall be 40 mils, minimum.

a. Projections and Flashings: All pipes, pipe sleeves, and other similar projections through the membrane shall be made watertight, and all flashings and similar construction shall be secured thoroughly in place.

b. Protection: Waterproofing against which backfill is to be placed shall be protected by a single layer of construction fabric. Construction fabric shall be carefully and neatly fitted around projections and shall cover the entire surface of the waterproofing.

3.5.3 Equipment Calibration (For Two-Component Systems Only)

Spray equipment for two-component systems shall be calibrated each day at start of operations, after each restart if spraying operations have been terminated for more than 1 hour, wherever there is a change in fan pattern or pressure, whenever slow curing areas are noticed, whenever a change is made in hose length or working height and after changeover between materials. Calibration shall consist of demonstrating that the equipment is adjusted to deliver components in the proper proportions. Calibration tests shall be done on the utilidor section adjacent to the area to be sprayed.

3.6 PAINTING AND FINISHING

3.6.1 Ferrous Metal Surfaces Inside Utilidors and Manholes

All ferrous metal surfaces in utilidors and manholes, excluding piping, but including racks, supports, hangers, and covers, shall be treated by the following method unless specifically directed otherwise in the project specifications:

Items shall be galvanized coated with ASTM B 633, Type I, Class Fe/Zn 25; or ASTM A 153, Class A.

Racks, hangers, and support system shall be galvanized by the following method.

All pipe hangers and supports shall be hot-dip galvanized after fabrication to provide a Coating Grade of 65 (average zinc coating of 1.5 ounces/square foot) in accordance with ASTM A 123.

Ladders shall be galvanized.

Axles for pipe rollers shall be galvanized.

If surfaces have been shop-coated, the shop coat shall be thoroughly cleaned and touched-up at corroded, scarred, abraded surfaces, cut edges, exposed threads, or welded areas as follows: areas shall be given two coats (minimum) of cold galvanizing compound in accordance with manufacturer's recommendations.

The following items are not required to be treated. These items may be provided as black steel with no galvanized coating.

Roller supports.

Protection saddles.

3.6.2 Ferrous Metal Surfaces Outside Manholes

All ferrous metal surfaces outside manholes shall be painted in accordance with SECTION 09900 PAINTS AND COATINGS. Buried sections of air vent pipes shall be coated with coal tar coating, exposed portions shall be painted.

3.7 INSULATION

The utilidors and manholes shall be insulated as shown and as hereinafter specified. Insulation shall be kept dry at all times and protected from weather and moisture before and after installation. Polystyrene insulation shall not be left exposed to direct sunlight for a combined period greater than 24 hours.

3.7.1 Requirements

The surfaces to be insulated shall be covered with extruded polystyrene. Exterior insulation for utilidors with traffic lids shall have the added requirement of 60 psi minimum compressive strength.

3.7.2 Installation of Insulation

3.7.2.1 Exterior Surfaces

Insulation shall be attached to exterior surfaces with an adhesive as recommended by the insulation manufacturer. If bituminous waterproofing is used, it shall be still hot during insulation installation.

a. Finish: Joints between blocks shall be buttered with insulation manufacturer's recommended mastic compatible with the waterproofing material, and blocks shall be butted snugly together. The insulation shall be protected during backfill operations to prevent any damage. Damaged insulation shall be replaced at no cost to the Government.

b. Openings: Openings in insulation around lifting loops, vents, and other protrusions shall be filled and cemented flush with the face of the insulation, with mastic as specified above.

3.8 QUALITY PROVISIONS

3.8.1 General

Tests shall be conducted before, during and after the installation of the system. All instruments, equipment, facilities, and labor required to properly conduct the tests shall be provided by the Contractor.

3.8.2 Field Tests

The following field test shall be conducted when applicable to the system involved. If any failures occur, the Contractor shall make adjustments or replacements as the Contracting Officer may direct, and the tests shall be repeated until satisfactory installation and operation are achieved.

3.8.2.1 Equipment

All pumps, alarms, controls, and any other operable items of equipment shall be operated to verify proper operation and compliance with the specifications.

3.8.3 Heating and Temperature Monitoring Plan

The Contractor shall submit his plan for heating and temperature monitoring for the utilidor system. This plan shall include, but not be limited to: heater types and locations, monitor types and locations, inspection schedule, and contingency plan.

3.9 CLEANING OF UTILIDOR SYSTEM

After tests are completed, and before utilidor covers are placed, the utilidors, sumps, and manholes shall be broom-cleaned of dirt and debris to the satisfaction of the Contracting Officer. Utilidor lids shall be placed and sealed immediately after approval by the Contracting Officer.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02740

BASE COURSE AND BITUMINOUS PAVING FOR
VEHICLE TRAFFIC AREAS

PART 1 GENERAL

1.1 REFERENCES
1.2 GENERAL
1.3 SUBMITTALS
1.4 MEASUREMENT AND PAYMENT

PART 2 PRODUCTS

2.1 JOB MIX DESIGN
2.2 AGGREGATE BASE COURSE MATERIAL
2.3 PRIME COAT
2.4 ASPHALT MATERIAL
2.5 TACK COAT MATERIAL

PART 3 EXECUTION

3.1 AGGREGATE BASE COURSE INSTALLATION
3.2 PRIME COAT APPLICATION
3.3 ASPHALT-CONCRETE PAVEMENT INSTALLATION
3.4 TACK COAT APPLICATION
3.5 CLEANING UP

-- End of Section Table of Contents --

SECTION 02740

BASE COURSE AND BITUMINOUS PAVING FOR VEHICLE TRAFFIC AREAS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 2397	(1998) Cationic Emulsified Asphalt

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 82	(1975; R 1996) Cut-Back Asphalt (Medium-Curing Type)
AASHTO M 226	(1980; R 1996) Viscosity Graded Asphalt Cement
AASHTO T 230	(1968; R 1993) Determining Degree of Pavement Compaction of Bituminous Aggregate Mixtures
AASHTO T 245-90	(Rev. 1991; T 245-91I) Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES (ADOT&PF)

ADOT&PF Specifications	(1998) Standard Specifications for Highway Construction
ADOT&PF T-17	Standard Method of Test of Bituminous Mix Design by the Marshall Method

1.2 GENERAL

Work shall conform to the applicable sections of ADOT&PF specifications in their entirety, except as otherwise specified herein.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Job Mix Design; G

SD-06 Test Reports

Aggregate Base Course;

Test results on current materials and in-place density.

SD-07 Certificates

Prime Coat;

Asphalt-Concrete Pavement Installation;

Test results on current plant mix and materials, and in-place density and smoothness.

Tack Coat;

1.4 MEASUREMENT AND PAYMENT

As specified in SECTION 01271 MEASUREMENT, PAYMENT AND CONTRACT COST BREAKDOWN.

PART 2 PRODUCTS

2.1 JOB MIX DESIGN

The mix design shall conform to the criteria listed herein, and shall utilize the same materials sources, aggregate gradations, and asphalt grade as will be used in the pavement. The mix design shall have been prepared by an independent commercial laboratory or by a State of Alaska laboratory no earlier than 2 years prior to the start of placement of pavement. The mix design shall have been prepared by ADOT&PF T-17, using the criteria listed under paragraph E.4 therein (50 blows/face).

2.2 AGGREGATE BASE COURSE MATERIAL

Gradation shall conform to ADOT&PF Specifications, Table 703-2, Grading D-1, except the percentage of particles by weight having diameters less than 0.02 mm shall be 0 to 3 percent.

2.3 PRIME COAT

Prime coat material shall conform to AASHTO M 82, Grade MC-30. For MC-30, the specification is modified to allow 35 percent maximum (instead of 25 percent) distillate at 437 degrees F and a minimum of 100 poises (instead of 300) viscosity on residue from distillation at 140 degrees F.

2.4 ASPHALT MATERIAL

Asphalt material shall conform to AASHTO M 226, Grade AC-5. A single source of asphalt material shall be used for the entire job. Aggregate gradation shall meet ADOT&PF Specifications, Table 703-3, Type II or III.

2.5 TACK COAT MATERIAL

Tack coat material shall be asphalt conforming to ASTM D 2397, Type CSS-1.

PART 3 EXECUTION

3.1 AGGREGATE BASE COURSE INSTALLATION

Compaction shall be 100 percent.

3.2 PRIME COAT APPLICATION

The rate of application of the prime coat shall be from 0.1 to 0.3 gallons per square yard.

3.3 ASPHALT-CONCRETE PAVEMENT INSTALLATION

Rolling shall be continued until a density of not less than 96 percent is obtained. Compaction shall be determined in accordance with AASHTO T 230except that the standard specimen shall be prepared in accordance with AASHTO T 245-90.

3.4 TACK COAT APPLICATION

The tack coat shall be applied at a rate that will result in an asphalt residual covering of 0.015 to 0.045 gallons per square yard.

3.5 CLEANING UP

The Contractor shall at all times keep the construction area free from accumulations of waste materials or rubbish and, prior to completion of the work, remove any rubbish from and about the premises and all tools, equipment and materials not the property of the Government. Upon completion of the construction, the Contractor shall leave the work and premises in a clean, neat and satisfactory condition.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02760

FIELD MOLDED SEALANTS FOR SEALING JOINTS IN RIGID PAVEMENTS

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 SAFETY
1.4 TEST REQUIREMENTS
1.5 EQUIPMENT
1.5.1 Joint Cleaning Equipment
1.5.1.1 Tractor-Mounted Routing Tool
1.5.1.2 Concrete Saw
1.5.1.3 Sandblasting Equipment
1.5.1.4 Waterblasting Equipment
1.5.1.5 Hand Tools
1.5.2 Sealing Equipment
1.5.2.1 Hot-Poured Sealing Equipment
1.6 TRIAL JOINT SEALANT INSTALLATION
1.7 DELIVERY AND STORAGE
1.8 ENVIRONMENTAL CONDITIONS

PART 2 PRODUCTS

2.1 SEALANTS
2.2 PRIMERS
2.3 BACKUP MATERIALS
2.4 BOND BREAKING TAPES

PART 3 EXECUTION

3.1 PREPARATION OF JOINTS
3.1.1 Existing Sealant Removal
3.1.2 Sawing
3.1.2.1 Facing and Refacing of Joints
3.1.3 Waterblasting
3.1.4 Back-Up Material
3.1.5 Bond Breaking Tape
3.1.6 Rate of Progress of Joint Preparation
3.2 PREPARATION OF SEALANT
3.2.1 Hot-Poured Sealants
3.3 INSTALLATION OF SEALANT
3.3.1 Time of Application
3.3.2 Sealing Joints
3.4 INSPECTION
3.4.1 Joint Cleaning
3.4.2 Joint Sealant Application Equipment
3.4.3 Joint Sealant
3.5 CLEAN-UP

-- End of Section Table of Contents --

SECTION 02760

FIELD MOLDED SEALANTS FOR SEALING JOINTS IN RIGID PAVEMENTS

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 this text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C 509	(1994) Elastomeric Cellular Preformed Gasket and Sealing Material
ASTM D 789	(1998) Determination of Relative Viscosity and Moisture Content of Polyamide (PA)
ASTM D 3569	(1995) Joint Sealant, Hot-Applied, Elastomeric, Jet-Fuel-Resistant-Type for Portland Cement Concrete Pavements

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Manufacturer's Instructions; G.

Where installation procedures, or any part thereof, are required to be in accordance with the manufacturer's recommendations, printed copies of these recommendations, 30 days prior to use on the project. Installation of the material will not be allowed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

Equipment; G.

List of proposed equipment to be used in performance of construction work including descriptive data, 30 days prior to use on the project.

SD-04 Samples

Materials; G.

Samples of the materials (sealant, primer if required, and

backup material), in sufficient quantity for testing and approval 30 days prior to the beginning of work. No material will be allowed to be used until it has been approved.

1.3 SAFETY

Joint sealant shall not be placed within 25 feet of any liquid oxygen (LOX) equipment, LOX storage, or LOX piping. Joints in this area shall be thoroughly cleaned and left unsealed.

1.4 TEST REQUIREMENTS

The joint sealant and backup or separating material shall be tested for conformance with the referenced applicable material specification. Testing of the materials shall be performed in an approved independent laboratory and certified copies of the test reports shall be submitted and approved 30 days prior to the use of the materials at the job site. Samples will be retained by the Government for possible future testing should the materials appear defective during or after application. Conformance with the requirements of the laboratory tests specified will not constitute final acceptance of the materials. Final acceptance will be based on the performance of the in-place materials.

1.5 EQUIPMENT

Machines, tools, and equipment used in the performance of the work required by this section shall be approved before the work is started and shall be maintained in satisfactory condition at all times.

1.5.1 Joint Cleaning Equipment

1.5.1.1 Tractor-Mounted Routing Tool

The routing tool used for removing old sealant from the joints shall be of such shape and dimensions and so mounted on the tractor that it will not damage the sides of the joints. The tool shall be designed so that it can be adjusted to remove the old material to varying depths as required. The use of V-shaped tools or rotary impact routing devices will not be permitted. Hand-operated spindle routing devices may be used to clean and enlarge random cracks.

1.5.1.2 Concrete Saw

A self-propelled power saw with water-cooled diamond or abrasive saw blades will be provided for cutting joints to the depths and widths specified or for refacing joints or cleaning sawed joints where sandblasting does not provide a clean joint.

1.5.1.3 Sandblasting Equipment

Sandblasting equipment shall include an air compressor, hose, and long-wearing venturi-type nozzle of proper size, shape and opening. The maximum nozzle opening should not exceed 1/4 inch. The air compressor shall be portable and shall be capable of furnishing not less than 150 cubic feet per minute and maintaining a line pressure of not less than 90 psi at the nozzle while in use. Compressor capability under job conditions must be demonstrated before approval. The compressor shall be equipped with traps that will maintain the compressed air free of oil and water. The nozzle shall have an adjustable guide that will hold the

nozzle aligned with the joint approximately 1 inch above the pavement surface. The height, angle of inclination and the size of the nozzle shall be adjusted as necessary to secure satisfactory results.

1.5.1.4 Waterblasting Equipment

Waterblasting equipment shall include a trailer-mounted water tank, pumps, high-pressure hose, wand with safety release cutoff control, nozzle, and auxiliary water resupply equipment. The water tank and auxiliary resupply equipment shall be of sufficient capacity to permit continuous operations. The nozzle shall have an adjustable guide that will hold the nozzle aligned with the joint approximately 1 inch above the pavement surface. The height, angle of inclination and the size of the nozzle shall be adjustable as necessary to obtain satisfactory results. A pressure gauge mounted at the pump shall show at all times the pressure in pounds per square inch at which the equipment is operating.

1.5.1.5 Hand Tools

Hand tools may be used, when approved, for removing defective sealant from a crack and repairing or cleaning the crack faces.

1.5.2 Sealing Equipment

1.5.2.1 Hot-Poured Sealing Equipment

The unit applicators used for heating and installing ASTM D 3569 joint sealant materials shall be mobile and shall be equipped with a double-boiler, agitator-type kettle with an oil medium in the outer space for heat transfer; a direct-connected pressure-type extruding device with a nozzle shaped for inserting in the joint to be filled; positive temperature devices for controlling the temperature of the transfer oil and sealant; and a recording type thermometer for indicating the temperature of the sealant. The applicator unit shall be designed so that the sealant will circulate through the delivery hose and return to the inner kettle when not in use.

1.6 TRIAL JOINT SEALANT INSTALLATION

Prior to the cleaning and sealing of the joints for the entire project, a test section of at least 200 feet long shall be prepared using the specified materials and approved equipment, so as to demonstrate the proposed joint preparation and sealing of all types of joints in the project. Following the completion of the test section and before any other joint is sealed, the test section shall be inspected to determine that the materials and installation meet the requirements specified. If it is determined that the materials or installation do not meet the requirements, the materials shall be removed, and the joints shall be recleaned and resealed at no cost to the Government. When the test section meets the requirements, it may be incorporated into the permanent work and paid for at the contract unit price per linear foot for sealing items scheduled. All other joints shall be prepared and sealed in the manner approved for sealing the test section.

1.7 DELIVERY AND STORAGE

Materials delivered to the job site shall be inspected for defects, unloaded, and stored with a minimum of handling to avoid damage.

Storage facilities shall be provided by the Contractor at the job site for maintaining materials at the temperatures and conditions recommended by the manufacturer.

1.8 ENVIRONMENTAL CONDITIONS

The ambient air temperature and the pavement temperature within the joint wall shall be a minimum of 50 degrees F and rising at the time of application of the materials. Sealant shall not be applied if moisture is observed in the joint.

PART 2 PRODUCTS

2.1 SEALANTS

Materials for sealing cracks in the various paved areas indicated on the drawings shall meet ASTM D 3569.

2.2 PRIMERS

Primers, when their use is recommended by the manufacturer of the sealant, shall be as recommended by the manufacturer of the sealant.

2.3 BACKUP MATERIALS

The backup material shall be a compressible, nonshrinking, nonstaining, nonabsorbing material and shall be nonreactive with the joint sealant. The material shall have a melting point at least 5 degrees F greater than the pouring temperature of the sealant being used when tested in accordance with ASTM D 789. The material shall have a water absorption of not more than 5 percent of the sample weight when tested in accordance with ASTM C 509. The backup material shall be 25 plus or minus 5 percent larger in diameter than the nominal width of the crack.

2.4 BOND BREAKING TAPES

The bond breaking tape or separating material shall be a flexible, nonshrinkable, nonabsorbing, nonstaining, and nonreacting adhesive-backed tape. The material shall have a melting point at least 5 degrees F greater than the pouring temperature of the sealant being used when tested in accordance with ASTM D 789. The bond breaker tape shall be approximately 1/8 inch wider than the nominal width of the joint and shall not bond to the joint sealant.

PART 3 EXECUTION

3.1 PREPARATION OF JOINTS

Immediately before the installation of the sealant, the joints shall be thoroughly cleaned to remove all laitance, curing compound, filler, protrusions of hardened concrete, and old sealant from the sides and upper edges of the joint space to be sealed.

3.1.1 Existing Sealant Removal

The in-place sealant shall be cut loose from both joint faces and to the depth shown on the drawings, using the tractor-mounted routing equipment as specified in paragraph EQUIPMENT. Depth shall be sufficient to accommodate any separating or backup material that is required to

maintain the depth of new sealant to be installed. Prior to further cleaning operations, all loose old sealant remaining in the joint opening shall be removed by blowing with compressed air. Hand tools may be required to remove sealant from random cracks. Chipping, spalling, or otherwise damaging the concrete will not be allowed.

3.1.2 Sawing

3.1.2.1 Facing and Refacing of Joints

Refacing and Facing of joints shall be accomplished using a concrete saw as specified in paragraph EQUIPMENT to remove all residual old sealant and a minimum of concrete from the joint face to provide exposure of newly cleaned concrete, and, if required, to enlarge the joint opening to the width and depth shown on the drawings. The blade shall be stiffened with a sufficient number of suitable dummy (used) blades or washers. Immediately following the sawing operation, the joint opening shall be thoroughly cleaned using a water jet to remove all saw cuttings and debris.

3.1.3 Waterblasting

The newly exposed concrete joint faces and the pavement surfaces extending a minimum of 1/2 inch from the joint edges shall be waterblasted clean. A multiple-pass technique shall be used until the surfaces are free of dust, dirt, curing compound, filler, old sealant residue, or any foreign debris that might prevent the bonding of the sealant to the concrete. After final cleaning and immediately prior to sealing, the joints shall be blown out with compressed air and left completely free of debris and water.

3.1.4 Back-Up Material

When the joint opening is of a greater depth than indicated for the sealant depth, the lower portion of the joint opening shall be plugged or sealed off using a back-up material to prevent the entrance of the sealant below the specified depth. Care shall be taken to ensure that the backup material is placed at the specified depth and is not stretched or twisted during installation.

3.1.5 Bond Breaking Tape

Where inserts or filler materials contain bitumen, or the depth of the joint opening does not allow for the use of a backup material, a bond breaker separating tape will be inserted to prevent incompatibility with the filler materials and three-sided adhesion of the sealant. The tape shall be securely bonded to the bottom of the joint opening so it will not float up into the new sealant.

3.1.6 Rate of Progress of Joint Preparation

The stages of joint preparation which include sandblasting, air pressure cleaning and placing of the back-up material shall be limited to only that lineal footage that can be sealed during the same day.

3.2 PREPARATION OF SEALANT

3.2.1 Hot-Poured Sealants

Sealants conforming to ASTM D 3569 shall not be heated in excess of the safe heating temperature recommended by the manufacturer as shown on the sealant containers. Sealant that has been overheated or subjected to application temperatures for over 4 hours or that has remained in the applicator at the end of the day's operation shall be withdrawn and wasted.

3.3 INSTALLATION OF SEALANT

3.3.1 Time of Application

Joints shall be sealed immediately following final cleaning of the joint walls and following the placement of the separating or backup material. Open joints that cannot be sealed under the conditions specified, or when rain interrupts sealing operations shall be recleaned and allowed to dry prior to installing the sealant.

3.3.2 Sealing Joints

Immediately preceding, but not more than 50 feet ahead of the joint sealing operations, a final cleaning with compressed air shall be performed. The joints shall be filled from the bottom up to 1/8 inch plus or minus 1/16 inch below the pavement surface. Excess or spilled sealant shall be removed from the pavement by approved methods and shall be discarded. The sealant shall be installed in such a manner as to prevent the formation of voids and entrapped air. In no case shall gravity methods or pouring pots be used to install the sealant material. Traffic shall not be permitted over newly sealed pavement until authorized by the Contracting Officer. When a primer is recommended by the manufacturer, it shall be applied evenly to the joint faces in accordance with the Manufacturer's Instructions. Joints shall be checked frequently to ensure that the newly installed sealant is cured to a tack-free condition within the time specified.

3.4 INSPECTION

3.4.1 Joint Cleaning

Joints shall be inspected during the cleaning process to correct improper equipment and cleaning techniques that damage the concrete pavement in any manner. Cleaned joints shall be approved prior to installation of the separating or back-up material and joint sealant.

3.4.2 Joint Sealant Application Equipment

The application equipment shall be inspected to ensure conformance to temperature requirements, proper proportioning and mixing (if two-component sealant) and proper installation. Evidences of bubbling, improper installation, failure to cure or set shall be cause to suspend operations until causes of the deficiencies are determined and corrected.

3.4.3 Joint Sealant

The joint sealant shall be inspected for proper rate of cure and set, bonding to the joint walls, cohesive separation within the sealant, reversion to liquid, entrapped air and voids. Sealants exhibiting any of these deficiencies at any time prior to the final acceptance of the project shall be removed from the joint, wasted, and replaced as specified herein at no additional cost to the Government.

3.5 CLEAN-UP

Upon completion of the project, all unused materials shall be removed from the site and the pavement shall be left in a clean condition.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02921

SEEDING

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 SOURCE INSPECTION
1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING
1.4.1 Delivery
1.4.1.1 Delivered Topsoil
1.4.1.2 Soil Amendments
1.4.2 Inspection
1.4.3 Storage
1.4.4 Handling
1.4.5 Time Limitation

PART 2 PRODUCTS

2.1 SEED
2.1.1 Seed Classification
2.1.2 Permanent Seed Species and Mixtures
2.1.3 Quality
2.1.4 Substitutions
2.2 TOPSOIL
2.3 SOIL AMENDMENTS
2.3.1 Lime
2.3.2 Fertilizer
2.4 MULCH
2.4.1 Straw
2.4.2 Hay
2.4.3 Wood Cellulose Fiber
2.4.4 Wood Chips
2.5 WATER

PART 3 EXECUTION

3.1 INSTALLING SEED TIME AND CONDITIONS
3.1.1 Seeding Time
3.1.2 Seeding Conditions
3.1.3 Equipment Calibration
3.1.4 Soil Test
3.2 SITE PREPARATION
3.2.1 Finished Grade and Topsoil
3.2.2 Application of Soil Amendments
3.2.2.1 Applying Lime
3.2.2.2 Applying Fertilizer
3.2.2.3 Applying Soil Conditioner
3.2.3 Tillage
3.2.4 Prepared Surface
3.2.4.1 Preparation

3.2.4.2 Lawn Area Debris
3.2.4.3 Field Area Debris
3.2.4.4 Protection
3.3 INSTALLATION
3.3.1 Installing Seed
3.3.2 Hydroseeding
3.3.3 Mulching
3.3.3.1 Hay or Straw Mulch
3.3.3.2 Mechanical Anchor
3.3.4 Watering Seed
3.4 RESTORATION AND CLEAN UP
3.4.1 Restoration
3.4.2 Clean Up
3.5 PROTECTION OF INSTALLED AREAS
3.6 SEED ESTABLISHMENT PERIOD
3.6.1 Commencement
3.6.2 Satisfactory Stand of Grass Plants
3.6.2.1 Lawn Area
3.6.2.2 Field Area
3.6.3 Maintenance During Establishment Period
3.6.3.1 Mowing
3.6.3.2 Post-Fertilization
3.6.3.3 Watering
3.6.3.4 Repair or Reinstall
3.6.3.5 Maintenance Record

-- End of Section Table of Contents --

SECTION 02921

SEEDING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. DEPARTMENT OF AGRICULTURE (USDA)

AMS Seed Act	(1995) Federal Seed Act Regulations Part 201

ASTM INTERNATIONAL (ASTM)

ASTM D 4972	(1995a) pH of Soils
ASTM D 5268	(1992; R 1996) Topsoil Used for Landscaping Purposes

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Equipment

A listing of equipment to be used for the seeding operation.

Erosion Control Materials

Chemical Treatment Material

Manufacturer's literature including physical characteristics, application and installation instructions for equipment, surface erosion control material and chemical treatment material.

Delivery

Delivery schedule.

Finished Grade and Topsoil

Finished grade status.

Topsoil

Availability of topsoil from the stripping and stock piling operation.

Quantity

Seed Establishment Period

Calendar time period for the seed establishment period. When there is more than one seed establishment period, the boundaries of the seeded area covered for each period shall be described.

Maintenance Record

Maintenance work performed, area repaired or reinstalled, diagnosis for unsatisfactory stand of grass plants.

SD-04 Samples

Delivered Topsoil

Samples taken from several locations at the source.

Soil Amendments

A 10 pound sample.

Mulch

A 10 pound sample.

SD-06 Test Reports

Equipment Calibration

Certification of calibration tests conducted on the equipment used in the seeding operation.

Soil Test

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

SD-07 Certificates

Seed; G, ED

Topsoil

pH Adjuster

Fertilizer

Organic Material

Soil Conditioner

Mulch

1.3 SOURCE INSPECTION

The source of delivered topsoil shall be subject to inspection.

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following:

a. Seed. Classification, botanical name, common name, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.

b. Topsoil. Particle size, pH, organic matter content, textural class, soluble salts, chemical and mechanical analyses.

c. pH Adjuster. Calcium carbonate equivalent and sieve analysis.

d. Fertilizer. Chemical analysis and composition percent.

e. Organic Material: Composition and source.

f. Soil Conditioner: Composition and source.

g. Mulch: Composition and source.

Bag count or bulk weight measurements of material used compared with area covered to determine the application rate and quantity installed.

1.4.1.1 Delivered Topsoil

Prior to the delivery of any topsoil, its availability shall be verified in paragraph TOPSOIL. A soil test shall be provided for topsoil delivered to the site.

1.4.1.2 Soil Amendments

Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A chemical analysis shall be provided for bulk deliveries.

1.4.2 Inspection

Seed shall be inspected upon arrival at the job site for conformity to species and quality by the Contracting Officer. Seed that is wet, moldy, or bears a test date five months or older, shall be rejected. Other materials shall be inspected for compliance with specified requirements. The following shall be rejected: open soil amendment containers or wet soil amendments; topsoil that contains slag, cinders,

stones, lumps of soil, sticks, roots, trash or other material over a minimum 1-1/2 inch diameter; and topsoil that contains viable plants and plant parts. Unacceptable materials shall be removed from the job site. Seed shall be in standard closed containers properly marked with seed name, quantities of each species (if mixed), lot number, net weight and percentages of purity, of germination, and maximum weed content.

1.4.3 Storage

Materials shall be stored in designated areas by the Contractor Officer. Seed, lime, and fertilizer shall be stored in cool, dry locations away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions and not with seeding operation materials.

1.4.4 Handling

Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

1.4.5 Time Limitation

Hydroseeding time limitation for holding seed in the slurry shall be a maximum 24 hours.

PART 2 PRODUCTS

2.1 SEED

2.1.1 Seed Classification

State-certified seed of the latest season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with AMS Seed Act and applicable state seed laws.

2.1.2 Permanent Seed Species and Mixtures

Permanent seed species and mixtures shall be proportioned by weight as follows:

Botanical Name	Common Name	Mixture Percent by Weight
Poa Prantensis	Kentucky Bluegrass	45
Arctared	Red Fescue	45
Lolium Multiflorum	Annual Ryegrass	10

2.1.3 Quality

Weed seed shall be a maximum 1 percent by weight of the total mixture. Wet, moldy or otherwise damaged seed shall be rejected.

2.1.4 Substitutions

Substitutions will not be allowed without written request and approval from the Contracting Officer.

2.2 TOPSOIL

Topsoil shall be as defined in ASTM D 5268. When available, the topsoil shall be the existing surface soil stripped and stockpiled onsite in accordance with SECTION 02300 EARTHWORK. When additional topsoil is required beyond the available topsoil from the stripping operation, topsoil shall be delivered and amended as recommended by the soil test for the seed specified. Topsoil shall be free from slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1/2 inch diameter. Topsoil shall be free from viable plants and plant parts.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of lime, fertilizer, organic material and soil conditioners meeting the following requirements. Vermiculite shall not be used.

2.3.1 Lime

Lime material shall contain a minimum calcium carbonate equivalent of 90 percent. Gradation: A minimum 90 percent shall pass through a No. 10 sieve and a minimum 50 percent shall pass through a No. 60 sieve.

2.3.2 Fertilizer

It shall be as recommended by the soil test . Fertilizer shall be controlled release commercial grade, free flowing, uniform in composition, and consist of a nitrogen-phosphorus-potassium ratio: 16 percent nitrogen, 20 percent phosphorous and 20 percent potassium.

2.4 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region.

2.4.1 Straw

Straw shall be stalks from barley furnished in air-dry condition and with a consistency for placing with commercial mulch-blowing equipment.

2.4.2 Hay

Hay shall be native hay, sudan-grass hay, broomsedge hay, or other herbaceous mowings, furnished in an air-dry condition suitable for placing with commercial mulch-blowing equipment.

2.4.3 Wood Cellulose Fiber

Wood cellulose fiber shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to facilitate placement during application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 4.5 to 6.0.

2.4.4 Wood Chips

Wood chips shall be chips or shredded bark with maximum particle size of 1/4 inch.

2.5 WATER

Water shall be the responsibility of the Contractor, unless otherwise noted. Water may be obtained on-site at water points approved by Fort Wainwright DPW. Water shall not contain elements toxic to plant life.

PART 3 EXECUTION

3.1 INSTALLING SEED TIME AND CONDITIONS

3.1.1 Seeding Time

Seed shall be installed from 30 May to 15 August.

3.1.2 Seeding Conditions

Seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the seeding operations, proposed alternate times shall be submitted for approval.

3.1.3 Equipment Calibration

Immediately prior to the commencement of seeding operations, calibration tests shall be conducted on the equipment to be used. These tests shall confirm that the equipment is operating within the manufacturer's specifications and will meet the specified criteria. The equipment shall be calibrated a minimum of once every day during the operation. The calibration test results shall be provided within 1 week of testing.

3.1.4 Soil Test

Delivered topsoil, existing soil in smooth graded areas, and stockpiled topsoil shall be tested in accordance with ASTM D 5268 and ASTM D 4972 for determining the particle size, pH, organic matter content, textural class, chemical analysis, soluble salts analysis, and mechanical analysis. Sample collection on site shall be random over the entire site. Sample collection for stockpiled topsoil shall be at different levels in the stockpile. The soil shall be free from debris, noxious weeds, toxic substances, or other materials harmful to plant growth. The test shall determine the quantities and type of soil amendments required to meet local growing conditions for the seed species specified.

3.2 SITE PREPARATION

3.2.1 Finished Grade and Topsoil

Finished grades shall match that of existing grade unless otherwise noted on drawings.

3.2.2 Application of Soil Amendments

3.2.2.1 Applying Lime

The lime shall be applied as recommended by the soil test. Lime shall be incorporated into the soil to a minimum depth of 4 inches or may be incorporated as part of the tillage operation.

3.2.2.2 Applying Fertilizer

The fertilizer shall be applied as recommended by the soil test. Fertilizer shall be incorporated into the soil to a maximum 4 inch depth or may be incorporated as part of the tillage or hydroseeding operation.

3.2.2.3 Applying Soil Conditioner

The soil conditioner shall be spread uniformly over the soil a minimum 1 inch depth and thoroughly incorporated by tillage into the soil to a maximum 4 inch depth.

3.2.3 Tillage

Soil on slopes up to a maximum 3-horizontal-to-1-vertical shall be tilled to a minimum 4 inch depth. On slopes between 3-horizontal-to-1-vertical and 1-horizontal-to-1 vertical, the soil shall be tilled perpendicular to the slopes a minimum 2 inch depth by scarifying with heavy rakes, or other method. Rototillers shall be used where soil conditions and length of slope permit. On slopes 1-horizontal-to-1 vertical and steeper, no tillage is required.

3.2.4 Prepared Surface

3.2.4.1 Preparation

The prepared surface shall be a maximum 1 inch below the adjoining grade of any surfaced area. New surfaces shall be blended to existing areas. The prepared surface shall be completed with a light raking to remove debris.

3.2.4.2 Lawn Area Debris

Remove from surface all debris, weeds, plant growth, stumps and stones over a maximum 1/2 inch in any dimension and any other irregularities which may interfere with the seeding operations, growth of grass, or subsequent maintenance.

3.2.4.3 Field Area Debris

Remove from surface all debris, weeds, plant growth, stumps and stones over a maximum 2 inches in any dimension and any other irregularities which may interfere with the seeding operations, growth of grass, or subsequent maintenance.

3.2.4.4 Protection

Areas with the prepared surface shall be protected from compaction or damage by vehicular or pedestrian traffic and surface erosion.

3.3 INSTALLATION

Prior to installing seed, any previously prepared surface compacted or damaged shall be reworked to meet the requirements of paragraph SITE PREPARATION. Seeding operations shall not take place when the wind

velocity will prevent uniform seed distribution.

3.3.1 Installing Seed

Choice of seeding method shall be hydroseeding. Other methods will be used when specified by the user(s). Seeding procedure shall ensure even coverage.

3.3.2 Hydroseeding

Seed and fertilizer shall be added to water and thoroughly mixed to meet the rates specified. Wood cellulose fiber mulch and tackifier shall be added at the rates recommended by the manufacturer after the seed, fertilizer, and water have been thoroughly mixed to produce a homogeneous slurry. Slurry shall be uniformly applied under pressure over the entire area. The hydroseeded area shall not be rolled.

3.3.3 Mulching

3.3.3.1 Hay or Straw Mulch

Hay or straw mulch shall be spread uniformly at the rate of 2.2 tons per acre. Mulch shall be spread by hand, blower-type mulch spreader, or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. All areas installed with seed shall be mulched on the same day as the seeding. Mulch shall be anchored immediately following spreading.

3.3.3.2 Mechanical Anchor

Mechanical anchor shall be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.

3.3.4 Watering Seed

Watering shall be within 7 days after completing the seeding of an area. Water shall be applied to supplement rainfall at a rate sufficient to ensure moist soil conditions to a minimum 1 inch depth. Run-off and puddling shall be prevented. Watering trucks shall not be driven over turf areas, unless otherwise directed. Watering of other adjacent areas or plant material shall be prevented.

3.4 RESTORATION AND CLEAN UP

3.4.1 Restoration

Existing turf areas, pavements, and facilities that have been damaged from the seeding operation shall be restored to original condition at Contractor's expense.

3.4.2 Clean Up

Excess and waste material shall be removed from the seeded areas and shall be disposed offsite. Adjacent paved areas shall be cleaned.

3.5 PROTECTION OF INSTALLED AREAS

Immediately upon completion of the seeding operation in an area, the area shall be protected against traffic or other use by erecting barricades and providing signage as required, or as directed by the Contracting Officer.

3.6 SEED ESTABLISHMENT PERIOD

3.6.1 Commencement

The seed establishment period to obtain a healthy stand of grass plants shall begin on the first day of work under this contract and shall end 3 months after the last day of the seeding operation. Written calendar time period shall be furnished for the seed establishment period. When there is more than 1 seed establishment period, the boundaries of the seeded area covered for each period shall be described.

3.6.2 Satisfactory Stand of Grass Plants

Grass plants shall be evaluated for species and health when the grass plants are a minimum 1 inch high.

3.6.2.1 Lawn Area

A satisfactory stand of grass plants from the seeding operation for a lawn area shall be a minimum 20 grass plants per square foot. Bare spots shall be a maximum 1-1/2 inches square. The total bare spots shall be a maximum 2 percent of the total seeded area.

3.6.2.2 Field Area

A satisfactory stand of grass plants from the seeding operation for a field area shall be a minimum 10 grass plants per square foot. The total bare spots shall not exceed 2 percent of the total seeded area.

3.6.3 Maintenance During Establishment Period

Maintenance of the seeded areas shall include eradicating weeds, insects and diseases; protecting embankments and ditches from surface erosion; maintaining erosion control materials and mulch; protecting installed areas from traffic; mowing; watering; and post-fertilization.

3.6.3.1 Mowing

a. Lawn Areas: Lawn areas shall be mowed to a minimum 3 inch height when the turf is a maximum 4 inches high. Clippings shall be removed.

b. Field Areas: Field areas shall be mowed once during the season to a minimum 3 inch height.

3.6.3.2 Post-Fertilization

The application rate shall be 4 pounds per 1000 square feet. A maximum 1/2 pound per 1000 square feet of actual available nitrogen shall be provided to the grass plants. The application shall be timed prior to the advent of winter dormancy and shall be made without burning the installed grass plants.

3.6.3.3 Watering

Watering shall be at intervals to obtain a moist soil condition to a minimum depth of 1 inch at all times. Frequency of watering and quantity of water shall be adjusted in accordance with growth of the grass plants. Run-off, puddling and wilting shall be prevented.

3.6.3.4 Repair or Reinstall

Unsatisfactory stand of grass plants and mulch shall be repaired or reinstalled, and eroded areas shall be repaired in accordance with paragraph SITE PREPARATION.

3.6.3.5 Maintenance Record

A record of each site visit shall be furnished, describing the maintenance work performed; areas repaired or reinstalled; and diagnosis for unsatisfactory stand of grass plants.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02930

EXTERIOR PLANTING

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 SOURCE INSPECTIONS
1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING
1.4.1 Delivery
1.4.1.1 Plant Material Identification
1.4.1.2 Protection During Delivery
1.4.1.3 Delivered Topsoil
1.4.1.4 Soil Amendments
1.4.2 Inspection
1.4.3 Storage
1.4.3.1 Plant Material Storage
1.4.3.2 Other Material Storage
1.4.4 Handling
1.4.5 Time Limitation
1.5 WARRANTY

PART 2 PRODUCTS

2.1 PLANT MATERIAL
2.1.1 Plant Material Classification
2.1.2 Plant Schedule
2.1.3 Substitutions
2.1.4 Quality
2.1.5 Growing Conditions
2.1.6 Method of Shipment to Maintain Health of Root System
2.1.6.1 Balled and Burlapped (BB) Plant Material
2.1.6.2 Balled and Potted (Pot) Plant Material
2.1.6.3 Balled and Platform (BP) Plant Material
2.1.6.4 Bare-Root (BR) Plant Material
2.1.6.5 Container-Grown (C) Plant Material
2.1.7 Growth of Trunk and Crown
2.1.7.1 Deciduous Trees
2.1.7.2 Coniferous Evergreen Plant Material
2.1.8 Plant Material Size
2.2 TOPSOIL
2.3 SOIL AMENDMENTS
2.3.1 pH Adjuster
2.3.1.1 Limestone
2.3.1.2 Hydrated Lime
2.3.1.3 Burnt Lime
2.3.2 Fertilizer
2.3.3 Organic Material
2.3.3.1 Bonemeal
2.3.3.2 Decomposed Wood Derivatives
2.4 MULCH

2.4.1 Organic Mulch
2.4.1.1 Shredded Bark
2.4.1.2 Wood Chips and Ground Bark
2.5 WOOD STAKING MATERIAL
2.5.1 Bracing Stake
2.5.2 Wood Ground Stakes
2.5.3 Deadmen
2.6 METAL STAKING AND GUYING MATERIAL
2.6.1 Bracing Stakes
2.6.2 Metal Ground Stakes
2.6.3 Earth Anchor
2.6.4 Guying Material
2.6.5 Turnbuckle
2.7 FLAG
2.8 WATER

PART 3 EXECUTION

3.1 INSTALLING PLANT MATERIAL TIME AND CONDITIONS
3.1.1 Deciduous Plant Material Time
3.1.2 Evergreen Plant Material Time
3.1.3 Plant Material Conditions
3.1.4 Tests
3.1.4.1 Soil Test
3.2 SITE PREPARATION
3.2.1 Finished Grade, Topsoil and Underground Utilities
3.2.2 Layout
3.2.3 Protecting Existing Vegetation
3.3 EXCAVATION
3.3.1 Obstructions Below Ground
3.3.2 Turf Removal
3.3.3 Plant Pits
3.4 INSTALLATION
3.4.1 Setting Plant Material
3.4.1.1 Bare-Root Plant Material
3.4.2 Tree Root Barrier
3.4.3 Backfill Soil Mixture
3.4.4 Adding Mycorrhizal Fungi Inoculum
3.4.5 Backfill Procedure
3.4.5.1 Balled and Burlapped, and Balled and Platformed Plant Material
3.4.5.2 Container-Grown and Balled and Potted Plant Material
3.4.5.3 Earth Berm
3.4.6 Watering
3.4.7 Staking and Guying
3.4.7.1 Two Bracing Stakes
3.4.7.2 Three Ground Stakes
3.4.8 Deadmen or Earth Anchors
3.4.9 Flags
3.5 FINISHING
3.5.1 Placing Mulch
3.6 MAINTENANCE DURING PLANTING OPERATION
3.7 RESTORATION AND CLEAN UP
3.7.1 Restoration
3.7.2 Clean Up
3.8 PLANT ESTABLISHMENT PERIOD
3.8.1 Commencement
3.8.2 Maintenance During Establishment Period
3.8.2.1 Watering Plant Material

3.8.2.2 Weeding
3.8.2.3 Maintenance Record
3.8.3 Unhealthy Plant Material
3.8.4 Maintenance Instructions

-- End of Section Table of Contents --

SECTION 02930

EXTERIOR PLANTING

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 NURSERY AND LANDSCAPE ASSOCIATION (ANLA)

ANLA Z60.1	(1996) Nursery Stock

ASTM INTERNATIONAL (ASTM)

ASTM C 602	(1995a) Agricultural Liming Materials
ASTM D 4972	(1995a) pH of Soils
ASTM D 5268	(1992; R 1996) Topsoil Used for Landscaping Purposes

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Delivery;

Delivery schedule.

Plant Establishment Period; G.

Calendar time period for the plant establishment period. When there is more than one establishment period, the boundaries of the planted areas covered for each period shall be described.

Maintenance Record;

Maintenance work performed, quantity of plant losses, and replacements; and diagnosis of unhealthy plant material.

SD-04 Samples

Delivered Topsoil;

Samples taken from several locations at the source.

Soil Amendments; G.

A 10 pound sample.

Mulch; G.

A 10 pound sample.

SD-06 Test Reports

Soil Test;

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

SD-07 Certificates

Plant Material;

Topsoil;

pH Adjuster;

Fertilizer;

Organic Material;

Soil Conditioner;

Organic Mulch;

Mycorrhizal Fungi Inoculum;

Prior to delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following.

a. Plant Material: Classification, botanical name, common name, size, quantity by species, and location where grown.

b. Topsoil: Particle size, pH, organic matter content, textural class, soluble salts, chemical and mechanical analyses.

c. pH Adjuster: Sieve analysis and calcium carbonate equivalent.

d. Fertilizer: Chemical analysis and composition percent.

e. Organic Material: Composition and source.

f. Soil Conditioner: Composition and source.

g. Organic Mulch: Composition, source, and treatment against fungi growth.

h. Mycorrhizal Fungi Inoculum: Plant material treated.

SD-10 Operation and Maintenance Data

Maintenance Instructions;

Instruction for year-round care of installed plant material.

1.3 SOURCE INSPECTIONS

The nursery or source of plant material and the source of delivered topsoil shall be subject to inspection.

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

1.4.1.1 Plant Material Identification

Plant material shall be identified with attached, durable, waterproof labels and weather-resistant ink, stating the correct botanical plant name and size.

1.4.1.2 Protection During Delivery

Plant material shall be protected during delivery to prevent desiccation and damage to the branches, trunk, root system, or earth ball. Branches shall be protected by tying-in. Exposed branches shall be covered during transport.

1.4.1.3 Delivered Topsoil

Prior to the delivery of any topsoil, the availability of topsoil shall be verified in paragraph TOPSOIL. A soil test shall be provided for delivered topsoil.

1.4.1.4 Soil Amendments

Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A chemical analysis shall be provided for bulk deliveries.

1.4.2 Inspection

Plant material shall be well shaped, vigorous and healthy with a healthy, well branched root system, free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement or abrasion. Plant material shall be checked for unauthorized substitution and to establish nursery grown status. Plant material showing desiccation, abrasion, sun-scald injury, disfigurement, or unauthorized substitution shall be rejected. The plant material shall exhibit typical form of branch to height ratio; and meet the caliper and height measurements specified. Plant material that measures less than specified, or has been poled, topped off or headed back, shall be rejected. Container-grown plant

material shall show new fibrous roots and the root mass shall contain its shape when removed from the container. Plant material with broken or cracked balls; or broken containers shall be rejected. Bare-root plant material that is not dormant or is showing roots were pulled from the ground shall be rejected. Other materials shall be inspected for compliance with Part 2 PRODUCTS. Open soil amendment containers or wet soil amendments shall be rejected. Topsoil that contains slag, cinders, stones, lumps of soil, sticks, roots, trash or other material larger than 1/2 inch diameter shall be rejected. Topsoil that contains viable plant material and plant parts shall be rejected. Unacceptable material shall be removed from the job site.

1.4.3 Storage

1.4.3.1 Plant Material Storage

Plant material not installed on the day of arrival at the site shall be stored and protected in designated areas. Plant material shall not be stored longer than 30 days. Plant material shall be protected from direct exposure to wind and sun. Bare-root plant material shall be heeled-in. All plant material shall be kept in a moist condition by watering with a fine mist spray until installed.

1.4.3.2 Other Material Storage

Storage of other material shall be in designated areas. Soil amendments shall be stored in dry locations and away from contaminants.

1.4.4 Handling

Plant material shall not be injured in handling. Cracking or breaking the earth ball of balled and burlapped plant material shall be avoided. Plant material shall not be handled by the trunk or stems. Materials shall not be dropped from vehicles.

1.4.5 Time Limitation

Except for container-grown plant material, the time limitation from digging to installing plant material shall be a maximum 90 days. The time limitation between installing the plant material and placing the mulch shall be a maximum 24 hours.

1.5 WARRANTY

Furnished plant material shall have a warranty for plant growth to be in a vigorous growing condition for a minimum 12 month period. A minimum 12 month calendar time period for the warranty of plant growth shall be provided regardless of the contract time period. When plant material is determined to be unhealthy in accordance with paragraph PLANT ESTABLISHMENT PERIOD, it shall be replaced once under this warranty.

PART 2 PRODUCTS

2.1 PLANT MATERIAL

2.1.1 Plant Material Classification

The plant material shall be nursery grown stock conforming to ANLA Z60.1 and shall be the species specified.

2.1.2 Plant Schedule

The plant schedule shall provide botanical names as included in one or more of the publications listed under "Nomenclature" in ANLA Z60.1.

2.1.3 Substitutions

Substitutions will not be permitted without written request and approval from the Contracting Officer.

2.1.4 Quality

Well shaped, well grown, vigorous plant material having healthy and well branched root systems in accordance with ANLA Z60.1 shall be provided. Plant material shall be provided free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement and abrasion. Plant material shall be free of shock or damage to branches, trunk, or root systems, which may occur from the digging and preparation for shipment, method of shipment, or shipment. Plant quality is determined by the growing conditions; method of shipment to maintain health of the root system; and growth of the trunk and crown as follows.

2.1.5 Growing Conditions

Plant material shall be native to or well-suited to the growing conditions of the project site. Plant material shall be grown under climatic conditions similar to those at the project site.

2.1.6 Method of Shipment to Maintain Health of Root System

2.1.6.1 Balled and Burlapped (BB) Plant Material

Ball size and ratio shall be in accordance with ANLA Z60.1. The ball shall be of a diameter and depth to encompass enough fibrous and feeding root system necessary for the full recovery of the plant. The plant stem or trunk shall be centered in the ball. All roots shall be clean cut at the ball surface. Roots shall not be pulled from the ground. Before shipment the root ball shall be dipped in gels containing mycorrhizal fungi inoculum. The root ball shall be completely wrapped with burlap or other suitable material and securely laced with biodegradable twine.

2.1.6.2 Balled and Potted (Pot) Plant Material

Ball size and ratio shall be in accordance with ANLA Z60.1. The ball shall be of a diameter and depth to encompass enough fibrous and feeding root system necessary for the full recovery of the plant. Removal shall be done by hand digging or mechanical devices. The plant stem or trunk shall be centered in the ball. All roots shall be clean cut at the ball surface. Roots shall not be pulled from the ground. Before shipment the root ball shall be dipped in gels containing mycorrhizal fungi inoculum. Container shall be used to retain the ball unbroken. Container shall be rigid to hold ball shape and protect root mass during shipping.

2.1.6.3 Balled and Platform (BP) Plant Material

Ball size and ratio shall be in accordance with ANLA Z60.1. Plants

shall be prepared as balled and burlapped plant material and securely fastened to wood platform for shipping.

2.1.6.4 Bare-Root (BR) Plant Material

Minimum root spread shall be in accordance with ANLA Z60.1. A well branched root system characteristic of the species specified shall be provided. Roots shall not be pulled from the ground. Bare-root plant material shall be inoculated with mycorrhizal fungi during germination in the nursery. Before shipment the root system shall be dipped in gels containing mycorrhizal fungi inoculum. Bare-root plant material shall be dormant. The root system shall be protected from drying out.

2.1.6.5 Container-Grown (C) Plant Material

Container size shall be in accordance with ANLA Z60.1. Plant material shall be grown in a container over a duration of time for new fibrous roots to have developed and for the root mass to retain its shape and hold together when removed from the container. Container-grown plant material shall be inoculated with mycorrhizal fungi during germination in the nursery. Before shipment the root system shall be dipped in gels containing mycorrhizal fungi inoculum. The container shall be sufficiently rigid to hold ball shape and protect root mass during shipping.

2.1.7 Growth of Trunk and Crown

2.1.7.1 Deciduous Trees

A height to caliper relationship shall be provided in accordance with ANLA Z60.1. Height of branching shall bear a relationship to the size and species of tree specified and with the crown in good balance with the trunk. The trees shall not be "poled" or the leader removed.

a. Single stem: The trunk shall be reasonably straight and symmetrical with crown and have a persistent main leader.

b. Multi-stem: All countable stems, in aggregate, shall average the size specified. To be considered a stem, there shall be no division of the trunk which branches more than 6 inches from ground level.

c. Specimen: The tree provided shall be well branched and pruned naturally according to the species. The form of growth desired, which may not be in accordance with natural growth habit, shall be as indicated.

2.1.7.2 Coniferous Evergreen Plant Material

Coniferous Evergreen plant material shall have the height-to-spread ratio recommended by ANLA Z60.1. The coniferous evergreen trees shall not be "poled" or the leader removed. Acceptable plant material shall be exceptionally heavy, well shaped and trimmed to form a symmetrical and tightly knit plant. The form of growth desired shall be as indicated.

2.1.8 Plant Material Size

One tree shall replace each tree removed for performance of the project.

Trees shall be birch or spruce, 3 inch diameter or larger, a minimum 5 feet tall measured from ground. Plant material larger in size than specified may be provided at no additional cost to the Government.

2.2 TOPSOIL

Topsoil shall be as defined in ASTM D 5268. When available, the topsoil shall be the existing surface soil stripped and stockpiled onsite in accordance with Section 02300 EARTHWORK. When additional topsoil is required beyond the available topsoil from the stripping operation, topsoil shall be delivered and amended as recommended by the soil test for the plant material specified. Topsoil shall be free from slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1/2 inch diameter. Topsoil shall be free from viable plants and plant parts.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of pH adjuster, fertilizer, organic material and soil conditioners meeting the following requirements. Vermiculite is not recommended.

2.3.1 pH Adjuster

The pH adjuster shall be an agricultural liming material in accordance with ASTM C 602. These materials may be burnt lime, hydrated lime, ground limestone, or shells. The pH adjuster shall be used to create a favorable soil pH for the plant material specified.

2.3.1.1 Limestone

Limestone material shall contain a minimum calcium carbonate equivalent of 80 percent. Gradation: A minimum 95 percent shall pass through a No. 8 sieve and a minimum 55 percent shall pass through a No. 60 sieve. To raise soil pH, ground limestone shall be used.

2.3.1.2 Hydrated Lime

Hydrated lime shall contain a minimum calcium carbonate equivalent of 110 percent. Gradation: A minimum 100 percent shall pass through a No. 8 sieve and a minimum 97 percent shall pass through a No. 60 sieve.

2.3.1.3 Burnt Lime

Burnt lime shall contain a minimum calcium carbonate equivalent of 140 percent. Gradation: A minimum 95 percent shall pass through a No. 8 sieve and a minimum 35 percent shall pass through a No. 60 sieve.

2.3.2 Fertilizer

It shall be as recommended by the soil test. Fertilizer shall be controlled release commercial grade; free flowing, pellet or tablet form; uniform in composition; and consist of a nitrogen-phosphorus-potassium ratio. The fertilizer shall be derived from sulphur coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylenediurea (IBDU). Fertilizer shall be balanced with the inclusion of trace minerals and micro-nutrients.

2.3.3 Organic Material

Organic material shall consist of either bonemeal, peat, decomposed wood derivatives, or worm castings.

2.3.3.1 Bonemeal

Bonemeal shall be a finely ground, steamed bone product containing from 2 to 4 percent nitrogen and 16 to 40 percent phosphoric acid.

2.3.3.2 Decomposed Wood Derivatives

Decomposed wood derivatives shall be ground bark, sawdust, or other wood waste material free of stones, sticks, and toxic substances harmful to plants, and stabilized with nitrogen.

2.4 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region. Rotted manure is not recommended to be used as a mulch because it would encourage surface rooting of the plant material and weeds.

2.4.1 Organic Mulch

Organic mulch materials shall be native to the project site and consist of recycled mulch, shredded bark, wood chips, or ground bark.

2.4.1.1 Shredded Bark

Locally shredded material shall be treated to retard the growth of mold and fungi.

2.4.1.2 Wood Chips and Ground Bark

Locally chipped or ground material shall be treated to retard the growth of mold and fungi. Gradation: A maximum 2 inch wide by 4 inch long.

2.5 WOOD STAKING MATERIAL

Wood stakes shall be hardwood or fir; rough sawn; free from knots, rot, cross grain, or other defects that would impair their strength.

2.5.1 Bracing Stake

Wood bracing stakes shall be a minimum 2 x 2 inch square and a minimum 8 feet long with a point at one end. Stake shall be set without damaging rootball.

2.5.2 Wood Ground Stakes

Wood ground stakes shall be a minimum of 2 x 2 inch square and a minimum 3 feet long with a point at one end.

2.5.3 Deadmen

Wood deadmen shall be a minimum 4 x 4 x 36 inches long.

2.6 METAL STAKING AND GUYING MATERIAL

Metal shall be aluminum or steel consisting of recycled content made for holding plant material in place.

2.6.1 Bracing Stakes

Metal bracing stakes shall be a minimum 1 inch diameter and a minimum 8 feet long. Stake shall be set without damaging rootball.

2.6.2 Metal Ground Stakes

Metal ground stakes shall be a minimum 1/2 inch diameter and a minimum 3 feet long.

2.6.3 Earth Anchor

Metal earth anchors shall be a minimum 1/2 inch diameter and a minimum 2 feet long.

2.6.4 Guying Material

Metal guying material shall be a minimum 12 gauge wire. Multi-strand cable shall be woven wire. Guying material tensile strength shall conform to the size of tree to be held firmly in place.

2.6.5 Turnbuckle

Metal turnbuckles shall be galvanized or cadmium-plated steel, and shall be a minimum 3 inches long with closed screw eyes on each end. Screw thread tensile strength shall conform to the size of tree to be held firmly in place.

2.7 FLAG

Plastic flag material shall be used on guying material. It shall be a minimum 6 inches long. Tape color shall be consistent and visually complimentary to the entire project area. The tape color shall meet pedestrian visual safety requirements for day and night.

2.8 WATER

Unless otherwise directed, water shall be the responsibility of the Contractor. Water shall not contain elements toxic to plant life.

PART 3 EXECUTION

3.1 INSTALLING PLANT MATERIAL TIME AND CONDITIONS

3.1.1 Deciduous Plant Material Time

Deciduous plant material shall be installed from May 15 to August 15.

3.1.2 Evergreen Plant Material Time

Evergreen plant material shall be installed from May 15 to August 15.

3.1.3 Plant Material Conditions

Planting operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture,

frozen ground or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the planting operations, proposed planting times shall be submitted for approval.

3.1.4 Tests

3.1.4.1 Soil Test

Delivered topsoil, excavated plant pit soil, and stockpiled topsoil shall be tested in accordance with ASTM D 5268 and ASTM D 4972 for determining the particle size, pH, organic matter content, textural class, chemical analysis, soluble salts analysis, and mechanical analysis. Sample collection onsite shall be random over the entire site. Sample collection for stockpiled topsoil shall be at different levels in the stockpile. The soil shall be free from debris, noxious weeds, toxic substances, or other materials harmful to plant growth. The test shall determine the quantities and type of soil amendments required to meet local growing conditions for the plant material specified.

3.2 SITE PREPARATION

3.2.1 Finished Grade, Topsoil and Underground Utilities

The Contractor shall verify that finished grades are as indicated on drawings, and that the placing of topsoil, the smooth grading, and the compaction requirements have been completed in accordance with Section 02300 EARTHWORK, prior to the commencement of the planting operation. The location of underground utilities and facilities in the area of the planting operation shall be verified. Damage to underground utilities and facilities shall be repaired at the Contractor's expense.

3.2.2 Layout

Plant material locations and bed outlines shall be staked on the project site before any excavation is made. Plant material locations may be adjusted to meet field conditions.

3.2.3 Protecting Existing Vegetation

When there are established lawns in the planting area, the turf shall be covered and/or protected during planting operations. Existing trees, shrubs, and plant beds that are to be preserved shall be barricaded along the dripline to protect them during planting operations.

3.3 EXCAVATION

3.3.1 Obstructions Below Ground

When obstructions below ground affect the work, adjustments to plant material location shall be made as directed by the Contracting Officer.

3.3.2 Turf Removal

Where the planting operation occurs in an existing lawn area, the turf shall be removed from the excavation area to a depth that will ensure the removal of the entire root system.

3.3.3 Plant Pits

Plant pits for ball and burlapped or container plant material shall be dug to a depth equal to the height of the root ball as measured from the base of the ball to the base of the plant trunk. Plant pits for bare-root plant material shall be dug to a depth equal to the height of the root system. Plant pits shall be dug a minimum 50 percent wider than the ball or root system to allow for root expansion. The pit shall be constructed with sides sloping towards the base as a cone, to encourage well aerated soil to be available to the root system for favorable root growth. Cylindrical pits with vertical sides shall not be used.

3.4 INSTALLATION

3.4.1 Setting Plant Material

Plant material shall be set plumb and held in position until sufficient soil has been firmly placed around root system or ball. In relation to the surrounding grade, the plant material shall be set even with the grade at which it was grown.

3.4.1.1 Bare-Root Plant Material

Bare-root plant material shall be placed in water a minimum 30 minutes prior to setting.

3.4.2 Tree Root Barrier

Tree root barriers shall be installed as recommended by the manufacturer. Tree root barriers shall be used for trees located up to a maximum 6 feet from paved surfaces or structures.

3.4.3 Backfill Soil Mixture

The backfill soil mixture may be a mix of topsoil and soil amendments suitable for the plant material specified. When practical, the excavated soil from the plant pit that is not amended provides the best backfill and shall be used.

3.4.4 Adding Mycorrhizal Fungi Inoculum

Mycorrhizal fungi inoculum shall be added as recommended by the manufacturer for the plant material specified.

3.4.5 Backfill Procedure

Prior to backfilling, all metal, wood, synthetic products, or treated burlap devices shall be removed from the ball or root system avoiding damage to the root system. The backfill procedure shall remove air pockets from around the root system. Additional requirements are as follows.

3.4.5.1 Balled and Burlapped, and Balled and Platformed Plant Material

Biodegradable burlap and tying material shall be carefully opened and folded back from the top a minimum 1/3 depth from the top of the root ball. Backfill mixture shall be added to the plant pit in 6 inch layers with each layer tamped.

3.4.5.2 Container-Grown and Balled and Potted Plant Material

The plant material shall be carefully removed from containers that are not biodegradeable. Prior to setting the plant in the pit, a maximum 1/4 depth of the root mass, measured from the bottom, shall be spread apart to promote new root growth. For plant material in biodegradable containers the container shall be split prior to setting the plant with container. Backfill mixture shall be added to the plant pit in 6 inch layers with each layer tamped.

3.4.5.3 Earth Berm

An earth berm, consisting of backfill soil mixture, shall be formed with a minimum 4 inch height around the edge of the plant pit to aid in water retention and to provide soil for settling adjustments.

3.4.6 Watering

Plant pits and plant beds shall be watered immediately after backfilling, until completely saturated.

3.4.7 Staking and Guying

Staking will be required when trees are unstable or will not remain set due to their size, shape, or exposure to high wind velocity.

3.4.7.1 Two Bracing Stakes

Trees from 4 to 8 feet height shall be firmly anchored in place with 2 bracing stakes placed on opposite sides. Bracing stakes shall be driven vertically into firm ground and shall not injure the ball or root system. The tree shall be held firmly between the stakes with a double strand of guying material. The guying material shall be firmly anchored at a minimum 1/2 tree height and shall prevent girdling. Chafing guards shall be used when metal is the guying material.

3.4.7.2 Three Ground Stakes

Trees over a minimum 8 feet height and less than a maximum 6 inch caliper shall be held firmly in place with 3 bracing or ground stakes spaced equidistantly around the tree. Ground stakes shall be avoided in areas to be mowed. Stakes shall be driven into firm ground outside the earth berm. The guying material shall be firmly anchored at a minimum 1/2 tree height and shall prevent girdling. For trees over maximum 3 inch diameter at breast height, turnbuckles shall be used on the guying material for tree straightening purposes. One turnbuckle shall be centered on each guy line. Chafing guards shall be used when metal is the guying material.

3.4.8 Deadmen or Earth Anchors

Trees over a minimum 6 inch caliper shall be held firmly in place with wood deadmen buried a minimum 3 feet in the ground or metal earth anchors. Multi-strand cable guying material shall be firmly anchored at a minimum 1/2 tree height and shall prevent girdling. Turnbuckles shall be used on the guying material for tree straightening purposes. One turnbuckle shall be centered on each guy line. Chafing guards shall be used.

3.4.9 Flags

A flag shall be securely fastened to each guy line equidistant between the tree and the stake, deadmen, or earth anchor. The flag shall be visible to pedestrians.

3.5 FINISHING

3.5.1 Placing Mulch

The placement of mulch shall occur a maximum 48 hours after planting. Mulch, used to reduce soil water loss, regulate soil temperature and prevent weed growth, shall be spread to cover the installed area with a minimum 4 inch uniform thickness. Mulch shall be kept out of the crowns of shrubs, ground cover, and vines and shall be kept off buildings, sidewalks and other facilities.

3.6 MAINTENANCE DURING PLANTING OPERATION

Installed plant material shall be maintained in a healthy growing condition. Maintenance operations shall begin immediately after each plant is installed to prevent desiccation and shall continue until the plant establishment period commences. Installed areas shall be kept free of weeds, grass, and other undesired vegetation. The maintenance includes maintaining the mulch, watering, and adjusting settling.

3.7 RESTORATION AND CLEAN UP

3.7.1 Restoration

Turf areas, pavements and facilities that have been damaged from the planting operation shall be restored to original condition at the Contractor's expense.

3.7.2 Clean Up

Excess and waste material shall be removed from the installed area and shall be disposed offsite. Adjacent paved areas shall be cleared.

3.8 PLANT ESTABLISHMENT PERIOD

3.8.1 Commencement

The plant establishment period for maintaining exterior plantings in a healthy growing condition shall commence on the first day of exterior planting work under this contract and shall continue through the remaining life of the contract and end 12 months after the last day of exterior planting required by this contract.

3.8.2 Maintenance During Establishment Period

Maintenance of plant material shall include straightening plant material, straightening stakes; tightening guying material; correcting girdling; supplementing mulch; pruning dead or broken branch tips; maintaining plant material labels; watering; eradicating weeds, insects and disease; post-fertilization; and removing and replacing unhealthy plants.

3.8.2.1 Watering Plant Material

The plant material shall be watered as necessary to prevent desiccation and to maintain an adequate supply of moisture within the root zone. An adequate supply of moisture is estimated to be the equivalent of 1 inch absorbed water per week, delivered in the form of rain or augmented by watering. Run-off, puddling and wilting shall be prevented. Unless otherwise directed, watering trucks shall not be driven over turf areas. Watering of other adjacent areas or existing plant material shall be prevented.

3.8.2.2 Weeding

Grass and weeds in the installed areas shall not be allowed to reach a maximum 3 inches height before being completely removed, including the root system.

3.8.2.3 Maintenance Record

A record shall be furnished describing the maintenance work performed, the quantity of plant losses, diagnosis of the plant loss, and the quantity of replacements made on each site visit.

3.8.3 Unhealthy Plant Material

A tree shall be considered unhealthy or dead when the main leader has died back, or up to a maximum 25 percent of the crown has died. This condition shall be determined by scraping on a branch an area 1/16 inch square, maximum, to determine if there is a green cambium layer below the bark. Unhealthy or dead plant material shall be removed immediately and shall be replaced as soon as seasonal conditions permit.

3.8.4 Maintenance Instructions

Written instructions shall be furnished containing drawings and other necessary information for year-round care of the installed plant material; including, when and where maintenance should occur, and the procedures for plant material replacement,.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 03 - CONCRETE

SECTION 03101

FORMWORK FOR CONCRETE

PART 1 GENERAL

1.1 REFERENCES
1.2 DESIGN REQUIREMENTS
1.3 SUBMITTALS
1.4 SHOP DRAWINGS
1.5 SAMPLE PANELS

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 Forms and Form Liners
2.1.2 Form Coating
2.2 ACCESSORIES

PART 3 EXECUTION

3.1 INSTALLATION
3.1.1 Form Construction
3.1.2 Chamfering
3.1.3 Coating
3.2 FORM REMOVAL
3.2.1 Formwork Not Supporting Weight of Concrete
3.2.2 Formwork Supporting Weight of Concrete
3.2.3 Tunnel Forms
3.3 INSPECTION

-- End of Section Table of Contents --

SECTION 03101

FORMWORK FOR CONCRETE

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ACI INTERNATIONAL (ACI)

ACI 347R	(1994; R 1999) Guide to Formwork for Concrete

ASTM INTERNATIONAL (ASTM)

ASTM C 31/C 31M	(2000) Making and Curing Concrete Test Specimens in the Field
ASTM C 39/C 39M	(2001) Compressive Strength of Cylindrical Concrete Specimens
ASTM C 1074	(1998) Estimating Concrete Strength by the Maturity Method
ASTM C 1077	(1998) Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation

1.2 DESIGN REQUIREMENTS

The design, engineering, and construction of the formwork shall be the responsibility of the Contractor. The formwork shall be designed for anticipated live and dead loads and shall comply with the tolerances specified in SECTION 03300 CAST-IN-PLACE STRUCTURAL CONCRETE, paragraph CONSTRUCTION TOLERANCES. However, for surfaces with an ACI Class A surface designation, the allowable deflection for facing material between studs, for studs between walers and walers between bracing shall be limited to 0.0025 times the span. The formwork shall be designed as a complete system with consideration given to the effects of cementitious materials and mixture additives such as fly ash, cement type, plasticizers, accelerators, retarders, air entrainment, and others. The adequacy of formwork design and construction shall be monitored prior to and during concrete placement as part of the Contractor's approved Quality Control Plan.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Shop Drawings;

Drawings and design computations for all formwork required shall be submitted at least 30 days either before fabrication on site or before delivery of prefabricated forms. If reshoring is permitted, the method, including location, order, and time of erection and removal shall also be submitted for review.

SD-03 Product Data

Materials;

Manufacturer's literature shall be submitted for plywood, concrete form hard board, form accessories, prefabricated forms.

SD-04 Samples

Sample Panels; G

After shop drawings have been reviewed, sample panels for Class A finish with applied architectural treatment shall be built on the project site where directed.

SD-06 Test Reports

Inspection;

The Contractor shall submit field inspection reports for concrete forms and embedded items.

Formwork Not Supporting Weight of Concrete;

If forms are to be removed in less than 24 hours on formwork not supporting the weight of concrete, the evaluation and results of the control cylinder tests or maturity instrumentation shall be submitted to and approved before the forms are removed.

1.4 SHOP DRAWINGS

The shop drawings and data submitted shall include the type, size, quantity, and strength of all materials of which the forms are made, the plan for jointing of facing panels, details affecting the appearance, and the assumed design values and loading conditions.

1.5 SAMPLE PANELS

Panels shall be of sufficient size to contain joints and shall be not less than 6 feet long and 4 feet wide. The panels shall be of typical wall thickness and constructed containing the full allocation of reinforcing steel that will be used in the structure, with the forming system that duplicates in every detail the one that will be used in construction of the structure. The same concrete mixture proportion and materials, the same placement techniques and equipment, and the same finishing techniques and timing shall be used that are planned for the structure. Construction of Class A finish will not be permitted until sample panels have been approved. Sample panels shall be protected from

construction operations in a manner to protect approved finish, and are not to be removed until all Class A finish concrete has been accepted.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Forms and Form Liners

Forms and form liners shall be fabricated with facing materials that will produce a finish meeting the specified irregularities in formed surface requirements as defined in ACI 347R. Forms and form liners shall be fabricated with facing materials as specified below.

2.1.2 Form Coating

Form coating shall be commercial formulation that will not bond with, stain, cause deterioration, or any other damage to concrete surfaces. The coating shall not impair subsequent treatment of concrete surfaces depending upon bond or adhesion nor impede the wetting of surfaces to be cured with water or curing compounds. If special form liners are to be used, the Contractor shall follow the recommendation of the form coating manufacturer.

2.2 ACCESSORIES

Ties and other similar form accessories to be partially or wholly embedded in the concrete shall be of a commercially manufactured type. After the ends or end fasteners have been removed, the embedded portion of metal ties shall terminate not less than 2 inches from any concrete surface either exposed to view or exposed to water. Plastic snap ties may be used in locations where the surface will not be exposed to view. Form ties shall be constructed so that the ends or end fasteners can be removed without spalling the concrete.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Form Construction

Forms shall be constructed true to the structural design and required alignment. The form surface and joints shall be mortar tight and supported to achieve safe performance during construction, concrete placement, and form removal. The Contractor shall continuously monitor the alignment and stability of the forms during all phases to assure the finished product will meet the required surface class specified in paragraph FORMS AND FORM LINERS and tolerances specified in paragraph DESIGN REQUIREMENTS. Failure of any supporting surface either due to surface texture, deflection or form collapse shall be the responsibility of the Contractor as will the replacement or correction of unsatisfactory surfaces. When forms for continuous surfaces are placed in successive units, care shall be taken to fit the forms over the completed surface to obtain accurate alignment of the surface and to prevent leakage of mortar. Forms shall not be re-used if there is any evidence of defects which would impair the quality of the resulting concrete surface. All surfaces of used forms shall be cleaned of mortar and any other foreign material before reuse.

3.1.2 Chamfering

All exposed joints, edges and external corners shall be chamfered by molding placed in the forms unless the drawings specifically state that chamfering is to be omitted or as otherwise specified. Chamfered joints shall not be permitted where earth or rockfill is placed in contact with concrete surfaces. Chamfered joints shall be terminated twelve inches outside the limit of the earth or rockfill so that the end of the chamfers will be clearly visible.

3.1.3 Coating

Forms for exposed or painted surfaces shall be coated with form oil or a form-release agent before the form or reinforcement is placed in final position. The coating shall be used as recommended in the manufacturer's instructions. Forms for unexposed surfaces may be wet with water in lieu of coating immediately before placing concrete, except that, in cold weather when freezing temperatures are anticipated, coating shall be mandatory. Surplus coating on form surfaces and coating on reinforcing steel and construction joints shall be removed before placing concrete.

3.2 FORM REMOVAL

Forms shall not be removed without approval. The minimal time required for concrete to reach a strength adequate for removal of formwork without risking the safety of workers or the quality of the concrete depends on a number of factors including, but not limited to, ambient temperature, concrete lift heights, type and amount of concrete admixture, and type and amount of cementitious material in the concrete. It is the responsibility of the Contractor to consider all applicable factors and leave the forms in place until it is safe to remove them. In any case forms shall not be removed unless the minimum compressive strength is less than .75f'c. All removal shall be accomplished in a manner which will prevent damage to the concrete and ensure the complete safety of the structure. Where forms support more than one element, the forms shall not be removed until the form removal criteria are met by all supported elements. Evidence that concrete has gained sufficient strength to permit removal of forms shall be determined by tests on control cylinders. All control cylinders shall be stored in the structure or as near the structure as possible so they receive the same curing conditions and protection methods as given those portions of the structure they represent. Control cylinders shall be removed from the molds at an age of no more than 24 hours. All control cylinders shall be prepared and tested in accordance with ASTM C 31/C 31M and ASTM C 39/C 39M at the expense of the Contractor by an independent laboratory that complies with ASTM C 1077 and shall be tested within 4 hours after removal from the site. After obtaining approval, the Contractor may use maturity instrumentation instead of control cylinders to determine the compressive strength of the concrete. ASTM C 1074 procedures shall be used for estimating concrete strength by means of the maturity method. All expenses associated with instrumenting the concrete and evaluating the strength using maturity relationships shall be the responsibility of the Contractor.

3.2.1 Formwork Not Supporting Weight of Concrete

Formwork for walls, columns, sides of beams, gravity structures, and other vertical type formwork not supporting the weight of concrete shall

not be removed in less than 24 hours after concrete placement is completed. Form removal before 24 hours will be allowed for simple floor slab, sidewalks, and driveways provided the ambient temperature during this period has not fallen below 50 degrees F at any time since placement and evidence from compressive tests on field-cured concrete control cylinders or maturity instrumentation indicate's that the concrete has attained a compressive strength of at least .50f'c. Control cylinders shall be prepared for each set of forms to be removed before 24 hours.

3.2.2 Formwork Supporting Weight of Concrete

Formwork supporting weight of concrete and shoring shall not be removed until structural members have acquired sufficient strength to safely support their own weight and any construction or other superimposed loads to which the supported concrete may be subjected. As a minimum, forms shall be left in place until control concrete test cylinders or maturity instrumentation indicate evidence the concrete has attained at least 70 percent of the compressive strength required for the structure.

3.2.3 Tunnel Forms

Tunnel lining bulkhead forms shall not be removed in less than 12 hours and tunnel lining forms in not less than 16 hours.

3.3 INSPECTION

Forms and embedded items shall be inspected in sufficient time prior to each concrete placement by the Contractor in order to certify to the Contracting Officer that they are ready to receive concrete. The results of each inspection shall be reported in writing.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 03 - CONCRETE

SECTION 03150

WATERSTOPS

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 DELIVERY AND STORAGE

PART 2 PRODUCTS

2.1 WATERSTOPS
2.1.1 Non-Metallic Materials

PART 3 EXECUTION

3.1 JOINTS
3.2 WATERSTOPS, INSTALLATION AND SPLICES
3.2.1 Non-Metallic
3.2.1.1 Polyvinyl Chloride Waterstop
3.3 CONSTRUCTION JOINTS

-- End of Section Table of Contents --

SECTION 03150

WATERSTOPS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 572	(1974) Specifications for Polyvinylchloride Waterstop

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Waterstops; G

Shop drawings and fabrication drawings provided by the manufacturer or prepared by the Contractor.

SD-03 Product Data

Waterstops

Manufacturer's literature, including safety data sheets, for waterstops. Manufacturer's recommended instructions for installing waterstops; and for splicing non-metallic waterstops.

SD-04 Samples

Non-metallic Materials

Specimens identified to indicate manufacturer, type of material, size, quantity of material, and shipment or lot represented. Each sample shall be a piece not less than 12 inch long cut from each 200 ft of finished waterstop furnished, but not less than a total of 4 ft of each type, size, and lot furnished. One splice sample of each size and type for every 50 splices made in the factory and every 10 splices made at the job site. The splice samples shall be made using straight run pieces with the splice located at the mid-length of the sample

and finished as required for the installed waterstop. The total length of each splice shall be not less than 12 inches long.

SD-07 Certificates

Waterstops

Certificates of compliance stating that waterstops conform to the requirements specified.

1.3 DELIVERY AND STORAGE

Material delivered and placed in storage shall be stored off the ground and protected from moisture, dirt, and other contaminants.

PART 2 PRODUCTS

2.1 WATERSTOPS

Intersection and change of direction waterstops shall be shop fabricated.

2.1.1 Non-Metallic Materials`

Non-metallic waterstops shall be manufactured from a prime virgin resin; reclaimed material is not acceptable. The compound shall contain plasticizers, stabilizers, and other additives to meet specified requirements. Polyvinylchloride waterstops shall conform to COE CRD-C 572.

PART 3 EXECUTION

3.1 JOINTS

Joints shall be installed at locations indicated and as authorized.

3.2 WATERSTOPS, INSTALLATION AND SPLICES

Waterstops shall be installed at the locations shown to form a continuous water-tight diaphragm. Adequate provision shall be made to support and completely protect the waterstops during the progress of the work. Any waterstop punctured or damaged shall be repaired or replaced. Exposed waterstops shall be protected during application of form release agents to avoid being coated. Suitable guards shall be provided to protect exposed projecting edges and ends of partially embedded waterstops from damage when concrete placement has been discontinued. Splices shall be made by certified trained personnel using approved equipment and procedures.

3.2.1 Non-Metallic

Fittings shall be shop made using a machine specifically designed to mechanically weld the waterstop. A miter guide, proper fixturing (profile dependant), and portable power saw shall be used to miter cut the ends to be joined to ensure good alignment and contact between joined surfaces. The splicing of straight lengths shall be done by squaring the ends to be joined. Continuity of the characteristic features of the cross section of the waterstop (ribs, tabular center axis, protrusions, etc.) shall be maintained across the splice.

3.2.1.1 Polyvinyl Chloride Waterstop

Splices shall be made by heat sealing the adjacent waterstop edges together using a thermoplastic splicing iron utilizing a non-stick surface specifically designed for waterstop welding. The correct temperature shall be used to sufficiently melt without charring the plastic. The spliced area, when cooled, shall show no signs of separation, holes, or other imperfections when bent by hand in as sharp an angle as possible.

3.3 CONSTRUCTION JOINTS

Construction joints are specified in Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 03 - CONCRETE

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 WELDING
1.4 DELIVERY AND STORAGE

PART 2 PRODUCTS

2.1 REINFORCING STEEL
2.2 WELDED WIRE FABRIC
2.3 WIRE TIES
2.4 SUPPORTS

PART 3 EXECUTION

3.1 REINFORCEMENT
3.1.1 Placement
3.1.2 Splicing
3.2 DOWEL INSTALLATION

-- End of Section Table of Contents --

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ACI INTERNATIONAL (ACI)

ACI 318/318R	(1999) Building Code Requirements for Structural Concrete and Commentary

ASTM INTERNATIONAL (ASTM)

ASTM A 615/A 615M	(1996a) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 706/A 706M	(1998) Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

AMERICAN WELDING SOCIETY (AWS)

AWS D1.4	(1998) Structural Welding Code - Reinforcing Steel

CONCRETE REINFORCING STEEL INSTITUTE (CRSI)

CRSI MSP-1	(1996) Manual of Standard Practice

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Reinforcement

Detail drawings showing reinforcing steel placement, schedules, sizes, grades, and splicing and bending details. Drawings shall show support details including types, sizes and spacing.

SD-03 Product Data

Welding

A list of qualified welders names.

SD-07 Certificates

Reinforcing Steel

Certified copies of mill reports attesting that the reinforcing steel furnished contains no less than 25 percent recycled scrap steel and meets the requirements specified herein, prior to the installation of reinforcing steel.

1.3 WELDING

Welders shall be qualified in accordance with AWS D1.4. Qualification test shall be performed at the worksite and the Contractor shall notify the Contracting Officer 24 hours prior to conducting tests. Special welding procedures and welders qualified by others may be accepted as permitted by AWS D1.4.

1.4 DELIVERY AND STORAGE

Reinforcement and accessories shall be stored off the ground on platforms, skids, or other supports.

PART 2 PRODUCTS

2.1 REINFORCING STEEL

Reinforcing steel shall be deformed bars conforming to ASTM A 615/A 615M or ASTM A 706/A 706M, grades and sizes as indicated.

2.2 WELDED WIRE FABRIC

Welded wire fabric will not be used.

2.3 WIRE TIES

Wire ties shall be 16 gauge or heavier black annealed steel wire.

2.4 SUPPORTS

Bar supports for formed surfaces shall be designed and fabricated in accordance with CRSI MSP-1 and shall be steel or precast concrete blocks. Precast concrete blocks shall have wire ties and shall be not less than 4 inches square when supporting reinforcement on ground. Precast concrete block shall have compressive strength equal to that of the surrounding concrete. Where concrete formed surfaces will be exposed to weather or where surfaces are to be painted, steel supports within 1/2 inch of concrete surface shall be galvanized, plastic protected or of stainless steel. Concrete supports used in concrete exposed to view shall have the same color and texture as the finish surface. For slabs on grade, supports shall be precast concrete blocks, plastic coated steel fabricated with bearing plates, or specifically designed wire-fabric supports fabricated of plastic.

PART 3 EXECUTION

3.1 REINFORCEMENT

Reinforcement shall be fabricated to shapes and dimensions shown and shall conform to the requirements of ACI 318/318R. Reinforcement shall

be cold bent unless otherwise authorized. Bending may be accomplished in the field or at the mill. Bars shall not be bent after embedment in concrete. Safety caps shall be placed on all exposed ends of vertical concrete reinforcement bars that pose a danger to life safety. Wire tie ends shall face away from the forms.

3.1.1 Placement

Reinforcement shall be free from loose rust and scale, dirt, oil, or other deleterious coating that could reduce bond with the concrete. Reinforcement shall be placed in accordance with ACI 318/318R at locations shown plus or minus one bar diameter. Reinforcement shall not be continuous through expansion joints and shall be as indicated through construction or contraction joints. Concrete coverage shall be as indicated or as required by ACI 318/318R. If bars are moved more than one bar diameter to avoid interference with other reinforcement, conduits or embedded items, the resulting arrangement of bars, including additional bars required to meet structural requirements, shall be approved before concrete is placed.

3.1.2 Splicing

Splices of reinforcement shall conform to ACI 318/318R and shall be made only as required or indicated. Splicing shall be by lapping or by mechanical or welded butt connection; except that lap splices shall not be used for bars larger than No. 11 unless otherwise indicated. Welding shall conform to AWS D1.4. Welded butt splices shall be full penetration butt welds. Lapped bars shall be placed in contact and securely tied or spaced transversely apart to permit the embedment of the entire surface of each bar in concrete. Lapped bars shall not be spaced farther apart than one-fifth the required length of lap or 6 inches. Mechanical butt splices shall be in accordance with the recommendation of the manufacturer of the mechanical splicing device. Butt splices shall develop 125 percent of the specified minimum yield tensile strength of the spliced bars or of the smaller bar in transition splices. Bars shall be flame dried before butt splicing. Adequate jigs and clamps or other devices shall be provided to support, align, and hold the longitudinal centerline of the bars to be butt spliced in a straight line.

3.2 DOWEL INSTALLATION

Dowels shall be installed in slabs on grade at locations indicated and at right angles to joint being doweled. Dowels shall be accurately positioned and aligned parallel to the finished concrete surface before concrete placement. Dowels shall be rigidly supported during concrete placement. One end of dowels shall be coated with a bond breaker.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 03 - CONCRETE

SECTION 03300

CAST-IN-PLACE STRUCTURAL CONCRETE

PART 1 GENERAL

1.1 REFERENCES
1.2 LUMP SUM CONTRACT
1.3 SUBMITTALS
1.4 GENERAL REQUIREMENTS
1.4.1 Tolerances
1.4.1.1 Floors
1.4.2 Strength Requirements and w/c Ratio
1.4.2.1 Strength Requirements
1.4.3 Air Entrainment
1.4.4 Slump
1.4.5 Concrete Temperature
1.4.6 Size of Coarse Aggregate
1.4.7 Special Properties and Products
1.5 MIXTURE PROPORTIONS
1.5.1 Proportioning Studies for Normal Weight Concrete
1.5.2 Proportioning Studies for Flexural Strength Concrete
1.5.3 Average Compressive Strength Required for Mixtures
1.5.3.1 Computations from Test Records
1.5.3.2 Computations without Previous Test Records
1.5.4 Average Flexural Strength Required for Mixtures
1.6 STORAGE OF MATERIALS
1.7 GOVERNMENT ASSURANCE INSPECTION AND TESTING
1.7.1 Materials
1.7.2 Fresh Concrete
1.7.3 Hardened Concrete
1.7.4 Inspection

PART 2 PRODUCTS

2.1 CEMENTITIOUS MATERIALS
2.1.1 Portland Cement
2.1.2 Pozzolan (Fly Ash)
2.1.3 Ground Granulated Blast-Furnace (GGBF) Slag
2.2 AGGREGATES
2.2.1 Fine Aggregate
2.2.2 Coarse Aggregate
2.3 CHEMICAL ADMIXTURES
2.3.1 Air-Entraining Admixture
2.3.2 Accelerating Admixture
2.3.3 Water-Reducing or Retarding Admixture
2.3.4 Surface Retarder
2.3.5 Expanding Admixture
2.3.6 Other Chemical Admixtures
2.4 CURING MATERIALS
2.4.1 Impervious-Sheet
2.4.2 Membrane-Forming Compound

2.4.3 Burlap and Cotton Mat
2.5 WATER
2.6 NONSHRINK GROUT
2.7 LATEX BONDING AGENT
2.8 EPOXY RESIN
2.9 EMBEDDED ITEMS
2.10 FLOOR HARDENER
2.11 PERIMETER INSULATION
2.12 VAPOR BARRIER
2.13 JOINT MATERIALS
2.13.1 Joint Fillers, Sealers, and Waterstops
2.13.2 Contraction Joints in Slabs

PART 3 EXECUTION

3.1 PREPARATION FOR PLACING
3.1.1 Foundations
3.1.1.1 Concrete on Earth Foundations
3.1.2 Previously Placed Concrete
3.1.3 Vapor Barrier
3.1.4 Perimeter Insulation
3.1.5 Embedded Items
3.2 CONCRETE PRODUCTION, SMALL PROJECTS
3.3 TRANSPORTING CONCRETE TO PROJECT SITE
3.4 CONVEYING CONCRETE ON SITE
3.4.1 Buckets
3.4.2 Transfer Hoppers
3.4.3 Trucks
3.4.4 Chutes
3.4.5 Concrete Pumps
3.5 PLACING CONCRETE
3.5.1 Depositing Concrete
3.5.2 Consolidation
3.5.3 Cold Weather Requirements
3.5.4 Hot Weather Requirements
3.5.5 Prevention of Plastic Shrinkage Cracking
3.5.6 Placing Concrete Underwater
3.6 JOINTS
3.6.1 Construction Joints
3.7 FINISHING FORMED SURFACES
3.7.1 Class D Finish
3.7.2 Light Broom Finish
3.8 REPAIRS
3.8.1 Damp-Pack Mortar Repair
3.8.2 Repair of Major Defects
3.8.2.1 Surface Application of Mortar Repair
3.8.2.2 Repair of Deep and Large Defects
3.9 FINISHING UNFORMED SURFACES
3.9.1 General
3.9.2 Exterior Slabs on Grade
3.9.3 Floated Finish
3.9.4 Curing and Protection
3.10 CURING
3.10.1 Moist Curing
3.10.2 Membrane Forming Curing Compounds
3.10.3 Impervious Sheeting
3.10.4 Cold Weather Curing and Protection
3.11 SETTING BASE PLATES AND BEARING PLATES
3.11.1 Nonshrink Grout

3.11.1.1 Mixing and Placing of Nonshrink Grout
3.11.1.2 Treatment of Exposed Surfaces
3.12 TESTING AND INSPECTION FOR CONTRACTOR QUALITY CONTROL
3.12.1 Grading and Corrective Action
3.12.1.1 Fine Aggregate
3.12.1.2 Coarse Aggregate
3.12.2 Quality of Aggregates
3.12.3 Scales, Batching and Recording
3.12.4 Batch-Plant Control
3.12.5 Concrete Mixture
3.12.6 Inspection Before Placing
3.12.7 Placing
3.12.8 Vibrators
3.12.9 Curing Inspection
3.12.10 Cold-Weather Protection
3.12.11 Mixer Uniformity
3.12.12 Reports

-- End of Section Table of Contents --

SECTION 03300

CAST-IN-PLACE STRUCTURAL CONCRETE

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ACI INTERNATIONAL (ACI)

ACI 117/117R	(1990; Errata) Standard Tolerances for Concrete Construction and Materials
ACI 211.1	(1991) Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 214.3R	(1988; R 1997) Simplified Version of the Recommended Practice for Evaluation of Strength Test Results of Concrete
ACI 305R	(1999) Hot Weather Concreting
ACI 318/318R	(1999) Building Code Requirements for Structural Concrete and Commentary

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 182	(1991; R 1996) Burlap Cloth Made From Jute or Kenaf

ASTM INTERNATIONAL (ASTM)

ASTM C 31/C 31M	(2000) Making and Curing Concrete Test Specimens in the Field
ASTM C 33	(1999ael) Concrete Aggregates
ASTM C 39/C 39M	(2001) Compressive Strength of Cylindrical Concrete Specimens
ASTM C 42/C 42M	(1999) Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C 78	(1994) Flexural Strength of Concrete (Using Simple Beam With Third-Point Loading)
ASTM C 94	(1994) Ready-Mixed Concrete
ASTM C 94/C 94M	(2000e2) Ready-Mixed Concrete

ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates
ASTM C 143/C 143M	(2000) Slump of Hydraulic Cement Concrete
ASTM C 150	(1999a) Portland Cement
ASTM C 171	(1997a) Sheet Materials for Curing Concrete
ASTM C 172	(1999) Sampling Freshly Mixed Concrete
ASTM C 192/C 192M	(2000) Making and Curing Concrete Test Specimens in the Laboratory
ASTM C 231	(1997el) Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260	(2000) Air-Entraining Admixtures for Concrete
ASTM C 309	(1998a) Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 494/C 494M	(1999ae1) Chemical Admixtures for Concrete
ASTM C 552	(2000) Cellular Glass Thermal Insulation
ASTM C 578	(1995) Rigid, Cellular Polystyrene Thermal Insulation
ASTM C 591	(1994) Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation
ASTM C 618	(2000) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM C 881	(1999) Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C 937	(1997) Grout Fluidifier for Preplaced-Aggregate Concrete
ASTM C 940	(1998a) Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory
ASTM C 989	(1999) Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
ASTM C 1017/C 1017M	(1998) Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C 1059	(1999) Latex Agents for Bonding Fresh to Hardened Concrete
ASTM C 1064/C 1064M	(1999) Temperature of Freshly Mixed

	Portland Cement Concrete
ASTM C 1077	(1998) Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM C 1107	(1999) Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM D 75	(1987; R 1997) Sampling Aggregates
ASTM D 1751	(1999) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM E 96	(2000) Water Vapor Transmission of Materials

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 94	(1995) Surface Retarders
COE CRD-C 104	(1980) Method of Calculation of the Fineness Modulus of Aggregate
COE CRD-C 400	(1963) Requirements for Water for Use in Mixing or Curing Concrete
COE CRD-C 521	(1981) Standard Test Method for Frequency and Amplitude of Vibrators for Concrete
COE CRD-C 540	(1971; R 1981) Standard Specification for Nonbituminous Inserts for Contraction Joints in Portland Cement Concrete Airfield Pavements, Sawable Type
COE CRD-C 572	(1974) Specifications for Polyvinylchloride Waterstop

NATIONAL READY-MIXED CONCRETE ASSOCIATION (NRMCA)

NRMCA CPMB 100	(1996) Concrete Plant Standards
NRMCA QC 3	(1984) Quality Control Manual: Section 3, Plant Certifications Checklist: Certification of Ready Mixed Concrete Production Facilities
NRMCA TMMB 100	(1994) Truck Mixer Agitator and Front Discharge Concrete Carrier Standards

1.2 LUMP SUM CONTRACT

Under this type of contract concrete items will be paid for by lump sum and will not be measured. The work covered by these items consists of furnishing all concrete materials, reinforcement, miscellaneous embedded materials, and equipment, and performing all labor for the forming,

manufacture, transporting, placing, finishing, curing, and protection of concrete in these structures.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Mixture Proportions; G.

The results of trial mixture design studies along with a statement giving the maximum nominal coarse aggregate size and the proportions of ingredients that will be used in the manufacture of each strength or class of concrete, at least 14 days prior to commencing concrete placing operations. Aggregate weights shall be based on the saturated surface dry condition. The statement shall be accompanied by test results from an approved independent commercial testing laboratory, showing that mixture design studies have been made with materials proposed for the project and that the proportions selected will produce concrete of the qualities indicated. No substitutions shall be made in the materials used in the mixture design studies without additional tests to show that the quality of the concrete is satisfactory.

SD-06 Test Reports

Testing and Inspection for Contractor Quality Control; G.

Certified copies of laboratory test reports, including mill tests and all other test data, for portland cement, blended cement, pozzolan, ground granulated blast furnace slag, silica fume, aggregate, admixtures, and curing compound proposed for use on this project.

1.4 GENERAL REQUIREMENTS

1.4.1 Tolerances

Except as otherwise specified herein, tolerances for concrete batching, mixture properties, and construction as well as definition of terms and application practices shall be in accordance with ACI 117/117R. Level and grade tolerance measurements of slabs shall be made as soon as possible after finishing; when forms or shoring are used, the measurements shall be made prior to removal.

1.4.1.1 Floors

For the purpose of this Section the following terminology correlation between ACI 117/117R and this Section shall apply:

Floor Profile Quality Classification From ACI 117/117R	This Section
Conventional Bullfloated	Same
Conventional Straightedged	Same
Flat	Float Finish or Trowel Finish
Very Flat	Same. Use only with F-system

Levelness tolerance shall not apply where design requires floors to be sloped to drains or sloped for other reasons.

1.4.2 Strength Requirements and w/c Ratio

1.4.2.1 Strength Requirements

Concrete shall have a 28-day compressive strength of f'c 4000 psi. Concrete slabs on-grade shall have a 28-day flexural strength of 650 psi. Compressive strength shall be determined in accordance with ASTM C 39/C 39M. Flexural strength shall be determined in accordance with ASTM C 78.

a. Evaluation of Concrete Compressive Strength. Compressive strength specimens (6 by 12 inch cylinders) shall be fabricated by the Contractor and laboratory cured in accordance with ASTM C 31/C 31M and tested in accordance with ASTM C 39/C 39M. The strength of the concrete will be considered satisfactory so long as the average of all sets of three consecutive test results equals or exceeds the specified compressive strength f'c and no individual test result falls below the specified strength f'c by more than 500 psi. A "test" is defined as the average of two companion cylinders, or if only one cylinder is tested, the results of the single cylinder test. Additional analysis or testing, including taking cores and/or load tests may be required at the Contractor's expense when the strength of the concrete in the structure is considered potentially deficient.

b. Investigation of Low-Strength Compressive Test Results. When any strength test of standard-cured test cylinders falls below the specified strength requirement by more than 500 psi or if tests of field-cured cylinders indicate deficiencies in protection and curing, steps shall be taken to assure that the load-carrying capacity of the structure is not jeopardized. When the strength of concrete in place is considered potentially deficient, cores shall be obtained and tested in accordance with ASTM C 42/C 42M. At least three representative cores shall be taken from each member or area of concrete in place that is considered potentially deficient. The location of cores will be determined by the Contracting Officer to least impair the strength of the structure. Concrete in the area represented by the core
testing will be considered adequate if the average strength of the
cores is equal to at least 85 percent of the specified strength requirement and if no single core is less than 75 percent of the specified strength requirement. Non-destructive tests (tests other than test cylinders or cores) shall not be used as a basis for acceptance or rejection. The Contractor shall perform the coring and repair the holes. Cores will be tested by the

Government.

c. Load Tests. If the core tests are inconclusive or impractical to obtain or if structural analysis does not confirm the safety of the structure, load tests may be directed by the Contracting Officer in accordance with the requirements of ACI 318/318R. Concrete work evaluated by structural analysis or by results of a load test as being understrength shall be corrected in a manner satisfactory to the Contracting Officer. All investigations, testing, load tests, and correction of deficiencies shall be performed by and at the expense of the Contractor and must be approved by the Contracting Officer, except that if all concrete is found to be in compliance with the drawings and specifications, the cost of investigations, testing, and load tests will be at the expense of the Government.

d. Evaluation of Concrete Flexural Strength. Flexural strength specimens (beams) shall be fabricated by the Contractor and laboratory cured in accordance with ASTM C 31/C 31M and tested in accordance with ASTM C 78. The strength of the concrete will be considered satisfactory so long as the average of all sets of three consecutive test results equals or exceeds the specified flexural strength and no individual test result falls below the specified flexural strength by more than 50 psi.A "test" is defined as the average of two companion beams. Additional analysis or testing, including taking cores and/or load tests may be required at the Contractor's expense when the strength of the concrete in the slab is considered potentially deficient.

1.4.3 Air Entrainment

All concrete shall be air entrained to contain between 4 and 7 percent total air, except that when the nominal maximum size coarse aggregate is 3/4 inch or smaller it shall be between 4.5 and 7.5 percent. Concrete with specified strength over 5000 psi may have 1.0 percent less air than specified above. Specified air content shall be attained at point of placement into the forms. Air content for normal weight concrete shall be determined in accordance with ASTM C 231.

1.4.4 Slump

Slump of the concrete, as delivered to the point of placement into the forms, shall be within the following limits. Slump shall be determined in accordance with ASTM C 143/C 143M.

Structural Element	Slump Minimum	Slump Maximum
Walls, columns and beams	2 in.	4 in.
Foundation walls, substructure walls, footings, slabs	1 in.	3 in.
Any structural concrete approved for placement by pumping:		
At pump	2 in.	6 in.
At discharge of line	1 in.	4 in.

1.4.5 Concrete Temperature

The temperature of the concrete as delivered shall not exceed 90 degrees F. When the ambient temperature during placing is 40 degrees F or less, or is expected to be at any time within 6 hours after placing, the temperature of the concrete as delivered shall be between 55 and 75 degrees F.

1.4.6 Size of Coarse Aggregate

The largest feasible nominal maximum size aggregate (NMSA) specified in paragraph AGGREGATES shall be used in each placement. However, nominal maximum size of aggregate shall not exceed any of the following: three-fourths of the minimum cover for reinforcing bars, three-fourths of the minimum clear spacing between reinforcing bars, one-fifth of the narrowest dimension between sides of forms, or one-third of the thickness of slabs or toppings.

1.4.7 Special Properties and Products

Concrete may contain admixtures other than air entraining agents, such as water reducers, superplasticizers, or set retarding agents to provide special properties to the concrete, if specified or approved. Any of these materials to be used on the project shall be used in the mix design studies.

1.5 MIXTURE PROPORTIONS

Concrete shall be composed of portland cement, other cementitious and pozzolanic materials as specified, aggregates, water and admixtures as specified.

1.5.1 Proportioning Studies for Normal Weight Concrete

Trial design batches, mixture proportioning studies, and testing requirements for various classes and types of concrete specified shall be the responsibility of the Contractor. Except as specified for flexural strength concrete, mixture proportions shall be based on compressive strength as determined by test specimens fabricated in accordance with ASTM C 192/C 192M and tested in accordance with ASTM C 39/C 39M. Samples of all materials used in mixture proportioning studies shall be representative of those proposed for use in the project and shall be accompanied by the manufacturer's or producer's test reports indicating compliance with these specifications. Trial mixtures having proportions, consistencies, and air content suitable for the work shall be made based on methodology described in ACI 211.1, using at least three different water-cement ratios for each type of mixture, which will produce a range of strength encompassing those required for each class and type of concrete required on the project. The maximum water-cement ratios required in subparagraph Water-Cement Ratio will be the equivalent water-cement ratio as determined by conversion from the weight ratio of water to cement plus pozzolan, silica fume, and ground granulated blast furnace slag (GGBF slag) by the weight equivalency method as described in ACI 211.1. In the case where silica fume or GGBF slag is used, the weight of the silica fume and GGBF slag shall be included in the equations in ACI 211.1 for the term P, which is used to denote the weight of pozzolan. If pozzolan is used in the concrete mixture, the minimum pozzolan content shall be 15 percent by weight of

the total cementitious material, and the maximum shall be 35 percent. Laboratory trial mixtures shall be designed for maximum permitted slump and air content. Separate sets of trial mixture studies shall be made for each combination of cementitious materials and each combination of admixtures proposed for use. No combination of either shall be used until proven by such studies, except that, if approved in writing and otherwise permitted by these specifications, an accelerator or a retarder may be used without separate trial mixture study. Separate trial mixture studies shall also be made for concrete for any conveying or placing method proposed which requires special properties and for concrete to be placed in unusually difficult placing locations. The temperature of concrete in each trial batch shall be reported. For each water-cement ratio, at least three test cylinders for each test age shall be made and cured in accordance with ASTM C 192/C 192M. They shall be tested at 7 and 28 days in accordance with ASTM C 39/C 39M. From these test results, a curve shall be plotted showing the relationship between water-cement ratio and strength for each set of trial mix studies. In addition, a curve shall be plotted showing the relationship between 7 day and 28 day strengths. Each mixture shall be designed to promote easy and suitable concrete placement, consolidation and finishing, and to prevent segregation and excessive bleeding.

1.5.2 Proportioning Studies for Flexural Strength Concrete

Trial design batches, mixture proportioning studies, and testing requirements shall conform to the requirements specified in paragraph Proportioning Studies for Normal Weight Concrete, except that proportions shall be based on flexural strength as determined by test specimens (beams) fabricated in accordance with ASTM C 192/C 192M and tested in accordance with ASTM C 78. Procedures given in ACI 211.1 shall be modified as necessary to accommodate flexural strength.

1.5.3 Average Compressive Strength Required for Mixtures

The mixture proportions selected during mixture design studies shall produce a required average compressive strength (f'cr) exceeding the specified compressive strength (f'c) by the amount indicated below. This required average compressive strength, f'cr, will not be a required acceptance criteria during concrete production. However, whenever the daily average compressive strength at 28 days drops below f'cr during concrete production, or daily average 7-day strength drops below a strength correlated with the 28-day f'cr, the mixture shall be adjusted, as approved, to bring the daily average back up to f'cr. During production, the required f'cr shall be adjusted, as appropriate, based on the standard deviation being attained on the job.

1.5.3.1 Computations from Test Records

Where a concrete production facility has test records, a standard deviation shall be established in accordance with the applicable provisions of ACI 214.3R. Test records from which a standard deviation is calculated shall represent materials, quality control procedures, and conditions similar to those expected; shall represent concrete produced to meet a specified strength or strengths (f'c) within 1,000 psi of that specified for proposed work; and shall consist of at least 30 consecutive tests. A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days. Required average compressive strength f'cr used as the basis for selection of concrete proportions shall be the larger of

the equations that follow using the standard deviation as determined above:

f'cr = f'c + 1.34S where units are in psi

f'cr = f'c + 2.33S - 500 where units are in psi

Where S = standard deviation

Where a concrete production facility does not have test records meeting the requirements above but does have a record based on 15 to 29 consecutive tests, a standard deviation shall be established as the product of the calculated standard deviation and a modification factor from the following table:

NUMBER OF TESTS	MODIFICATION FACTOR FOR STANDARD DEVIATION
15	1.16
20	1.08
25	1.03
30 or more	1.00

1.5.3.2 Computations without Previous Test Records

When a concrete production facility does not have sufficient field strength test records for calculation of the standard deviation, the required average strength f'cr shall be determined as follows:

a. If the specified compressive strength f'c is less than 3,000 psi,

   f'cr = f'c + 1000 psi

b. If the specified compressive strength f'c is 3,000 to 5,000 psi,

   f'cr = f'c + 1,200 psi

c. If the specified compressive strength f'c is over 5,000 psi,

   f'cr = f'c + 1,400 psi

1.5.4 Average Flexural Strength Required for Mixtures

The mixture proportions selected during mixture design studies for flexural strength mixtures and the mixture used during concrete production shall be designed and adjusted during concrete production as approved, except that the overdesign for average flexural strength shall simply be 15 percent greater than the specified flexural strength at all times.

1.6 STORAGE OF MATERIALS

Cement and other cementitious materials shall be stored in weathertight buildings, bins, or silos which will exclude moisture and contaminants and keep each material completely separated. Aggregate stockpiles shall be arranged and used in a manner to avoid excessive segregation and to prevent contamination with other materials or with other sizes of aggregates. Aggregate shall not be stored directly on ground unless a sacrificial layer is left undisturbed. Reinforcing bars and accessories

shall be stored above the ground on platforms, skids or other supports. Other materials shall be stored in such a manner as to avoid contamination and deterioration. Admixtures which have been in storage at the project site for longer than 6 months or which have been subjected to freezing shall not be used unless retested and proven to meet the specified requirements. Materials shall be capable of being accurately identified after bundles or containers are opened.

1.7 GOVERNMENT ASSURANCE INSPECTION AND TESTING

Day-to day inspection and testing shall be the responsibility of the Contractor Quality Control (CQC) staff. However, representatives of the Contracting Officer can and will inspect construction as considered appropriate and will monitor operations of the Contractor's CQC staff. Government inspection or testing will not relieve the Contractor of any of his CQC responsibilities.

1.7.1 Materials

The Government will sample and test aggregates, cementitious materials, other materials, and concrete to determine compliance with the specifications as considered appropriate. The Contractor shall provide facilities and labor as may be necessary for procurement of representative test samples. Samples of aggregates will be obtained at the point of batching in accordance with ASTM D 75. Other materials will be sampled from storage at the jobsite or from other locations as considered appropriate. Samples may be placed in storage for later testing when appropriate.

1.7.2 Fresh Concrete

Fresh concrete will be sampled as delivered in accordance with ASTM C 172 and tested in accordance with these specifications, as considered necessary.

1.7.3 Hardened Concrete

Tests on hardened concrete will be performed by the Government when such tests are considered necessary.

1.7.4 Inspection

Concrete operations may be tested and inspected by the Government as the project progresses. Failure to detect defective work or material will not prevent rejection later when a defect is discovered nor will it obligate the Government for final acceptance.

PART 2 PRODUCTS

2.1 CEMENTITIOUS MATERIALS

Cementitious Materials shall be portland cement, portland-pozzolan cement, or portland cement in combination with pozzolan and shall conform to appropriate specifications listed below. Use of cementitious materials in concrete which will have surfaces exposed in the completed structure shall be restricted so there is no change in color, source, or type of cementitious material.

2.1.1 Portland Cement

ASTM C 150, Type I low alkali with a maximum 15 percent amount of tricalcium aluminate, or Type II low alkali.

2.1.2 Pozzolan (Fly Ash)

ASTM C 618, Class C with the optional requirements for multiple factor, drying shrinkage, and uniformity from Table 2A of ASTM C 618. If pozzolan is used, it shall never be less than 15 percent nor more than 35 percent by weight of the total cementitious material.

2.1.3 Ground Granulated Blast-Furnace (GGBF) Slag

ASTM C 989, Grade 120.

2.2 AGGREGATES

Aggregates shall conform to the following.

2.2.1 Fine Aggregate

Fine aggregate shall conform to the quality and gradation requirements of ASTM C 33.

2.2.2 Coarse Aggregate

Coarse aggregate shall conform to ASTM C 33, Class 5S.

2.3 CHEMICAL ADMIXTURES

Chemical admixtures, when required or permitted, shall conform to the appropriate specification listed. Admixtures shall be furnished in liquid form and of suitable concentration for easy, accurate control of dispensing.

2.3.1 Air-Entraining Admixture

ASTM C 260 and shall consistently entrain the air content in the specified ranges under field conditions.

2.3.2 Accelerating Admixture

ASTM C 494/C 494M, Type C or E, except that calcium chloride or admixtures containing calcium chloride shall not be used.

2.3.3 Water-Reducing or Retarding Admixture

ASTM C 494/C 494M, Type A, B, or D, except that the 6-month and 1-year compressive and flexural strength tests are waived.

2.3.4 Surface Retarder

COE CRD-C 94.

2.3.5 Expanding Admixture

Aluminum powder type expanding admixture conforming to ASTM C 937.

2.3.6 Other Chemical Admixtures

Chemical admixtures for use in producing flowing concrete shall comply with ASTM C 1017/C 1017M, Type I or II. These admixtures shall be used only when approved in writing, such approval being contingent upon particular mixture control as described in the Contractor's Quality Control Plan and upon performance of separate mixture design studies.

2.4 CURING MATERIALS

2.4.1 Impervious-Sheet

Impervious-sheet materials shall conform to ASTM C 171, type optional, except, that polyethylene sheet shall not be used.

2.4.2 Membrane-Forming Compound

Membrane-Forming curing compound shall conform to ASTM C 309, Type 1-D or 2, except that only a styrene acrylate or chlorinated rubber compound meeting Class B requirements shall be used for surfaces that are to be painted or are to receive bituminous roofing, or waterproofing, or floors that are to receive adhesive applications of resilient flooring. The curing compound selected shall be compatible with any subsequent paint, roofing, waterproofing, or flooring specified. Nonpigmented compound shall contain a fugitive dye, and shall have the reflective requirements in ASTM C 309 waived.

2.4.3 Burlap and Cotton Mat

Burlap and cotton mat used for curing shall conform to AASHTO M 182.

2.5 WATER

Water for mixing and curing shall be fresh, clean, potable, and free of injurious amounts of oil, acid, salt, or alkali, except that non-potable water may be used if it meets the requirements of COE CRD-C 400.

2.6 NONSHRINK GROUT

Nonshrink grout shall conform to ASTM C 1107 and shall be a commercial formulation suitable for the proposed application.

2.7 LATEX BONDING AGENT

Latex agents for bonding fresh to hardened concrete shall conform to ASTM C 1059.

2.8 EPOXY RESIN

Epoxy resins for use in repairs shall conform to ASTM C 881, Type V, Grade 2. Class as appropriate to the existing ambient and surface temperatures.

2.9 EMBEDDED ITEMS

Embedded items shall be of the size and type indicated or as needed for the application. Dovetail slots shall be galvanized steel.

2.10 FLOOR HARDENER

Floor hardener shall be a colorless aqueous solution containing zinc silicofluoride, magnesium silicofluoride, or sodium silicofluoride. These silicofluorides can be used individually or in combination. Proprietary hardeners may be used if approved in writing by the Contracting Officer.

2.11 PERIMETER INSULATION

Perimeter insulation shall be polystyrene conforming to ASTM C 578, Type II; polyurethane conforming to ASTM C 591, Type II; or cellular glass conforming to ASTM C 552, Type I or IV.

2.12 VAPOR BARRIER

Vapor barrier shall be polyethylene sheeting with a minimum thickness of 6 mils or other equivalent material having a vapor permeance rating not exceeding 0.5 perms as determined in accordance with ASTM E 96.

2.13 JOINT MATERIALS

2.13.1 Joint Fillers, Sealers, and Waterstops

Expansion joint fillers shall be preformed materials conforming to ASTM D 1751.

2.13.2 Contraction Joints in Slabs

Sawable type contraction joint inserts shall conform to COE CRD-C 540. Nonsawable joint inserts shall have sufficient stiffness to permit placement in plastic concrete without undue deviation from a straight line and shall conform to the physical requirements of COE CRD-C 540, with the exception of Section 3.4 "Resistance to Sawing". Plastic inserts shall be polyvinyl chloride conforming to the materials requirements of COE CRD-C 572.

PART 3 EXECUTION

3.1 PREPARATION FOR PLACING

Before commencing concrete placement, the following shall be performed. Surfaces to receive concrete shall be clean and free from frost, ice, mud, and water. Transporting and conveying equipment shall be in-place, ready for use, clean, and free of hardened concrete and foreign material. Equipment for consolidating concrete shall be at the placing site and in proper working order. Equipment and material for curing and for protecting concrete from weather or mechanical damage shall be at the placing site, in proper working condition and in sufficient amount for the entire placement. When hot, windy conditions during concreting appear probable, equipment and material shall be at the placing site to provide windbreaks, shading, fogging, or other action to prevent plastic shrinkage cracking or other damaging drying of the concrete.

3.1.1 Foundations

3.1.1.1 Concrete on Earth Foundations

Earth (subgrade, base, or subbase courses) surfaces upon which concrete is to be placed shall be clean, damp, and free from debris, frost, ice, and standing or running water. Prior to placement of concrete, the

foundation shall be well drained and shall be satisfactorily graded and uniformly compacted.

3.1.2 Previously Placed Concrete

Concrete surfaces to which additional concrete is to be bonded shall be abraded in an approved manner that will expose sound aggregate uniformly without damaging the concrete. Laitance and loose particles shall be removed. Surfaces shall be thoroughly washed and shall be moist but without free water when concrete is placed.

3.1.3 Vapor Barrier

Vapor barrier shall be provided beneath the interior on-grade concrete floor slabs. The greatest widths and lengths practicable shall be used to
eliminate joints wherever possible. Joints shall be lapped a minimum of 12 inches. Torn, punctured, or damaged vapor barrier material shall be removed and new vapor barrier shall be provided prior to placing concrete.
For minor repairs, patches may be made using laps of at least 12 inches. Lapped joints shall be sealed and edges patched with pressure-sensitive adhesive or tape not less than 2 inches wide and compatible with the membrane. Vapor barrier shall be placed directly on underlying subgrade, base course, or capillary water barrier, unless it consists of crushed material or large granular material which could puncture the vapor barrier. In this case, the surface shall be choked with a light layer of sand, as approved, before placing the vapor barrier. A 2 inch layer of compacted, clean concrete sand (fine aggregate) shall be placed on top of the vapor barrier before placing concrete. Concrete placement shall be controlled so as to prevent damage to the vapor barrier, or any covering sand.

3.1.4 Perimeter Insulation

Perimeter insulation shall be installed at locations indicated. Adhesive shall be used where insulation is applied to the interior surface of foundation walls and may be used for exterior application.

3.1.5 Embedded Items

Before placement of concrete, care shall be taken to determine that all embedded items are firmly and securely fastened in place as indicated on the drawings, or required. Conduit and other embedded items shall be clean and free of oil and other foreign matter such as loose coatings or rust, paint, and scale. The embedding of wood in concrete will be permitted only when specifically authorized or directed. Voids in sleeves, inserts, and anchor slots shall be filled temporarily with readily removable materials to prevent the entry of concrete into voids. Welding shall not be performed on embedded metals within 1 feet of the surface of the concrete. Tack welding shall not be performed on or to embedded items.

3.2 CONCRETE PRODUCTION, SMALL PROJECTS

Batch-type equipment shall be used for producing concrete. Ready-mixed concrete shall be batched, mixed, and transported in accordance with ASTM C 94, except as otherwise specified. Truck mixers, agitators, and nonagitating transporting units shall comply with NRMCA TMMB 100.

Ready-mix plant equipment and facilities shall be certified in accordance with NRMCA QC 3. Approved batch tickets shall be furnished for each load of ready-mixed concrete. Site-mixed concrete shall be produced in accordance with ACI 301, and plant NRMCA CPMB 100.

3.3 TRANSPORTING CONCRETE TO PROJECT SITE

Concrete shall be transported to the placing site in truck mixers conforming to NRMCA TMMB 100.

3.4 CONVEYING CONCRETE ON SITE

Concrete shall be conveyed from mixer or transporting unit to forms as rapidly as possible and within the time interval specified by methods which will prevent segregation or loss of ingredients using following equipment. Conveying equipment shall be cleaned before each placement.

3.4.1 Buckets

The interior hopper slope shall be not less than 58 degrees from the horizontal, the minimum dimension of the clear gate opening shall be at least 5 times the nominal maximum-size aggregate, and the area of the gate opening shall not be less than 2 square feet.The maximum dimension of the gate opening shall not be greater than twice the minimum dimension. The bucket gates shall be essentially grout tight when closed and may be manually, pneumatically, or hydraulically operated except that buckets larger than 2 cubic yardsshall not be manually operated. The design of the bucket shall provide means for positive regulation of the amount and rate of deposit of concrete in each dumping position.

3.4.2 Transfer Hoppers

Concrete may be charged into nonagitating hoppers for transfer to other conveying devices. Transfer hoppers shall be capable of receiving concrete directly from delivery vehicles and shall have conical-shaped discharge features. The transfer hopper shall be equipped with a hydraulically operated gate and with a means of external vibration to effect complete discharge. Concrete shall not be held in nonagitating transfer hoppers more than 30 minutes.

3.4.3 Trucks

Truck mixers operating at agitating speed or truck agitators used for transporting plant-mixed concrete shall conform to the requirements of ASTM C 94/C 94M. Nonagitating equipment shall be used only for transporting plant-mixed concrete over a smooth road and when the hauling time is less than 15 minutes. Bodies of nonagitating equipment shall be smooth, watertight, metal containers specifically designed to transport concrete, shaped with rounded corners to minimize segregation, and equipped with gates that will permit positive control of the discharge of the concrete.

3.4.4 Chutes

When concrete can be placed directly from a truck mixer, agitator, or nonagitating equipment, the chutes normally attached to this equipment by the manufacturer may be used. A discharge deflector shall be used when required by the Contracting Officer. Separate chutes and other

similar equipment will not be permitted for conveying concrete.

3.4.5 Concrete Pumps

Concrete may be conveyed by positive displacement pump when approved. The pumping equipment shall be piston or squeeze pressure type; pneumatic placing equipment shall not be used. The pipeline shall be rigid steel pipe or heavy-duty flexible hose. The inside diameter of the pipe shall be at least 3 times the nominal maximum-size coarse aggregate in the concrete mixture to be pumped but not less than 4 inches. Aluminum pipe shall not be used.

3.5 PLACING CONCRETE

Mixed concrete shall be discharged within 1-1/2 hours or before the mixer drum has revolved 300 revolutions, whichever comes first after the introduction of the mixing water to the cement and aggregates. When the concrete temperature exceeds 85 degrees F, the time shall be reduced to 45 minutes. Concrete shall be placed within 15 minutes after it has been discharged from the transporting unit. Concrete shall be handled from mixer or transporting unit to forms in a continuous manner until the approved unit of operation is completed. Adequate scaffolding, ramps and walkways shall be provided so that personnel and equipment are not supported by in-place reinforcement. Placing will not be permitted when the sun, heat, wind, or limitations of facilities furnished by the Contractor prevent proper consolidation, finishing and curing. Sufficient placing capacity shall be provided so that concrete can be kept free of cold joints.

3.5.1 Depositing Concrete

Concrete shall be deposited as close as possible to its final position in the forms, and there shall be no vertical drop greater than 5 feet except where suitable equipment is provided to prevent segregation and where specifically authorized. Depositing of the concrete shall be so regulated that it will be effectively consolidated in horizontal layers not more than 12 inches thick, except that all slabs shall be placed in a single layer. Concrete to receive other construction shall be screeded to the proper level. Concrete shall be deposited continuously in one layer or in layers so that fresh concrete is deposited on in-place concrete that is still plastic. Fresh concrete shall not be deposited on concrete that has hardened sufficiently to cause formation of seams or planes of weakness within the section. Concrete that has surface dried, partially hardened, or contains foreign material shall not be used. When temporary spreaders are used in the forms, the spreaders shall be removed as their service becomes unnecessary. Concrete shall not be placed in slabs over columns and walls until concrete in columns and walls has been in-place at least two hours or until the concrete begins to lose its plasticity. Concrete for beams, girders, brackets, column capitals, haunches, and drop panels shall be placed at the same time as concrete for adjoining slabs.

3.5.2 Consolidation

Immediately after placing, each layer of concrete shall be consolidated by internal vibrators, except for slabs 4 inches thick or less. The vibrators shall at all times be adequate in effectiveness and number to properly consolidate the concrete; a spare vibrator shall be kept at the jobsite during all concrete placing operations. The vibrators shall

have a frequency of not less than 10,000 vibrations per minute, an amplitude of at least 0.025 inch, and the head diameter shall be appropriate for the structural member and the concrete mixture being placed. Vibrators shall be inserted vertically at uniform spacing over the area of placement. The distance between insertions shall be approximately 1-1/2 times the radius of action of the vibrator so that the area being vibrated will overlap the adjacent just-vibrated area by a reasonable amount. The vibrator shall penetrate rapidly to the bottom of the layer and at least 6 inches into the preceding layer if there is such. Vibrator shall be held stationary until the concrete is consolidated and then vertically withdrawn slowly while operating. Form vibrators shall not be used unless specifically approved and unless forms are constructed to withstand their use. Vibrators shall not be used to move concrete within the forms. Slabs 4 inches and less in thickness shall be consolidated by properly designed vibrating screeds or other approved technique. Excessive vibration of lightweight concrete resulting in segration or flotation of coarse aggregate shall be prevented. Frequency and amplitude of vibrators shall be determined in accordance with COE CRD-C 521. Grate tampers ("jitterbugs") shall not be used.

3.5.3 Cold Weather Requirements

Special protection measures, approved by the Contracting Officer, shall be used if freezing temperatures are anticipated before the expiration of the specified curing period. The ambient temperature of the air where concrete is to be placed and the temperature of surfaces to receive concrete shall be not less than 40 degrees F. The temperature of the concrete when placed shall be not less than 50 degrees F nor more than 75 degrees F. Heating of the mixing water or aggregates will be required to regulate the concrete placing temperature. Materials entering the mixer shall be free from ice, snow, or frozen lumps. Salt, chemicals or other materials shall not be incorporated in the concrete to prevent freezing. Upon written approval, an accelerating admixture conforming to ASTM C 494/C 494M, Type C or E may be used, provided it contains no calcium chloride. Calcium chloride shall not be used.

3.5.4 Hot Weather Requirements

When the ambient temperature during concrete placing is expected to exceed 85 degrees F, the concrete shall be placed and finished with procedures previously submitted and as specified herein. The concrete temperature at time of delivery to the forms shall not exceed the temperature shown in the table below when measured in accordance with ASTM C 1064/C 1064M. Cooling of the mixing water or aggregates or placing concrete in the cooler part of the day may be required to obtain an adequate placing temperature. A retarder may be used, as approved, to facilitate placing and finishing. Steel forms and reinforcements shall be cooled as approved prior to concrete placement when steel temperatures are greater than 120 degrees F. Conveying and placing equipment shall be cooled if necessary to maintain proper concrete-placing temperature.

Maximum Allowable Concrete Placing Temperature

Relative Humidity, Percent, During Time of Concrete Placement	Maximum Allowable Concrete Temperature Degrees
Greater than 60	90 F
40-60	85 F
Less than 40	80 F

3.5.5 Prevention of Plastic Shrinkage Cracking

During hot weather with low humidity, and particularly with appreciable wind, as well as interior placements when space heaters produce low humidity, the Contractor shall be alert to the tendency for plastic shrinkage cracks to develop and shall institute measures to prevent this. Particular care shall be taken if plastic shrinkage cracking is potentially imminent and especially if it has developed during a previous placement. Periods of high potential for plastic shrinkage cracking can be anticipated by use of Fig. 2.1.5 of ACI 305R. In addition the concrete placement shall be further protected by erecting shades and windbreaks and by applying fog sprays of water, sprinkling, ponding or wet covering. Plastic shrinkage cracks that occur shall be filled by injection of epoxy resin as directed, after the concrete hardens. Plastic shrinkage cracks shall never be troweled over or filled with slurry.

3.5.6 Placing Concrete Underwater

Concrete shall be deposited in water by a tremie or concrete pump. The methods and equipment used shall be subject to approval. Concrete buckets shall not be used for underwater placement of concrete except to deliver concrete to the tremie. The tremie shall be watertight and sufficiently large to permit a free flow of concrete. The concrete shall be deposited so that it enters the mass of the previously placed concrete from within, displacing water with a minimum disturbance to the surface of the concrete. The discharge end of the pump line or tremie shaft shall be kept continuously submerged in the concrete. The underwater seal at start of placing shall not produce undue turbulence in the water. The tremie shaft shall be kept full of concrete to a point well above the water surface. Placement shall proceed without interruption until the concrete has been brought to the required height. The tremie shall not be moved horizontally during a placing operation, and a sufficient number of tremies shall be provided so that the maximum horizontal flow of concrete will be limited to 15 feet. Concrete shall not be deposited in running water or in water with a temperature below 35 degrees F.

3.6 JOINTS

Joints shall be located and constructed as indicated or approved. Joints not indicated on the drawings shall be located and constructed to minimize the impact on the strength of the structure. In general, such joints shall be located near the middle of the spans of supported slabs, beams, and girders unless a beam intersects a girder at this point, in which case the joint in the girder shall be offset a distance equal to

twice the width of the beam. Joints in walls and columns shall be at the underside of floors, slabs, beams, or girders and at the tops of footings or floor slabs, unless otherwise approved. Joints shall be perpendicular to the main reinforcement. All reinforcement shall be continued across joints; except that reinforcement or other fixed metal items shall not be continuous through expansion joints, or through construction or contraction joints in slabs on grade. Reinforcement shall be 2 inches clear from each joint. Except where otherwise indicated, construction joints between interior slabs on grade and vertical surfaces shall consist of 30 pound asphalt-saturated felt, extending for the full depth of the slab. The perimeters of the slabs shall be free of fins, rough edges, spalling, or other unsightly appearance.

3.6.1 Construction Joints

Concrete shall be placed continuously so that each unit is monolithic in construction. Fresh concrete shall not be placed against adjacent hardened concrete until it is at least 24 hours old. Construction joints shall be located as indicated or approved. Where concrete work is interrupted by weather, end of work shift or other similar type of delay, location and type of construction joint shall be subject to approval of the Contracting Officer. Unless otherwise indicated and except for slabs on grade, reinforcing steel shall extend through construction joints. Construction joints in slabs on grade shall be keyed or doweled as shown. Concrete columns, walls, or piers shall be in place at least 2 hours, or until the concrete begins to lose its plasticity, before placing concrete for beams, girders, or slabs thereon. In walls having door or window openings, lifts shall terminate at the top and bottom of the opening. Other lifts shall terminate at such levels as to conform to structural requirements or architectural details. Where horizontal construction joints in walls or columns are required, a strip of 1 inchsquare-edge lumber, bevelled and oiled to facilitate removal, shall be tacked to the inside of the forms at the construction joint. Concrete shall be placed to a point 1 inch above the underside of the strip. The strip shall be removed 1 hour after the concrete has been placed, and any irregularities in the joint line shall be leveled off with a wood float, and all laitance shall be removed. Prior to placing additional concrete, horizontal construction joints shall be prepared as specified in paragraph Previously Placed Concrete.

3.7 FINISHING FORMED SURFACES

Forms, form materials, and form construction are specified herein. Surfaces shall be left with the texture imparted by the forms except that defective surfaces shall be repaired. Except for major defects, as defined hereinafter, surface defects shall be repaired as specified herein within 24 hours after forms are removed. Repairs of the so-called "plaster-type" will not be permitted in any location. Tolerances of formed surfaces shall conform to the requirements of ACI 117/117R. These tolerances apply to the finished concrete surface, not to the forms themselves; forms shall be set true to line and grade. Form tie holes requiring repair and other defects whose depth is at least as great as their surface diameter shall be repaired as specified in paragraph Damp-Pack Mortar Repair. Defects whose surface diameter is greater than their depth shall be repaired as specified in paragraph Repair of Major Defects. Repairs shall be finished flush with adjacent surfaces and with the same surface texture. The cement used for all repairs shall be a blend of job cement with white cement proportioned so

that the final color after curing and aging will be the same as the adjacent concrete. Concrete with excessive honeycomb, or other defects which affect the strength of the member, will be rejected. Repairs shall be demonstrated to be acceptable and free from cracks or loose or drummy areas at the completion of the contract. Repairs not meeting these requirements will be rejected and shall be replaced.

3.7.1 Class D Finish

Class D finish is required for foundation footings, wall, and patches in existing walls. Fins, ravelings, and loose material shall be removed, and, holes left by removal of form ties shall be reamed and filled. Honeycomb and other defects more than 1/2 inch deep or more than 2 inches in diameter shall be repaired. Defects more than 2 inches in diameter shall be cut back to sound concrete, but in all cases at least 1 inch deep.

3.7.2 Light Broom Finish

Exterior slabs on grade shall receive a light broom finish to be demonstrated and approved by the Contracting Officer prior to placement of the exterior slabs.

3.8 REPAIRS

3.8.1 Damp-Pack Mortar Repair

Form tie holes requiring repair and other defects whose depth is at least as great as their surface diameter but not over 4 inches shall be repaired by the damp-pack mortar method. Form tie holes shall be reamed and other similar defects shall be cut out to sound concrete. The void shall then be thoroughly cleaned, thoroughly wetted, brush-coated with a thin coat of neat cement grout and filled with mortar. Mortar shall be a stiff mix of 1 part portland cement to 2 parts fine aggregate passing the No. 16 mesh sieve, and minimum amount of water. Only sufficient water shall be used to produce a mortar which, when used, will stick together on being molded into a ball by a slight pressure of the hands and will not exude water but will leave the hands damp. Mortar shall be mixed and allowed to stand for 30 to 45 minutes before use with remixing performed immediately prior to use. Mortar shall be thoroughly tamped in place in thin layers using a hammer and hardwood block. Holes passing entirely through walls shall be completely filled from the inside face by forcing mortar through to the outside face. All holes shall be packed full. Damp-pack repairs shall be moist cured for at least 48 hours.

3.8.2 Repair of Major Defects

Major defects will be considered to be those more than 1/2 inch deep or, more than 1/2 inch in diameter. Also included are any defects of any kind whose depth is over 4 inches or whose surface diameter is greater than their depth. Major defects shall be repaired as specified below.

3.8.2.1 Surface Application of Mortar Repair

Defective concrete shall be removed, and removal shall extend into completely sound concrete. Approved equipment and procedures which will not cause cracking or microcracking of the sound concrete shall be used. If reinforcement is encountered, concrete shall be removed so as to

expose the reinforcement for at least 2 inches on all sides. All such defective areas greater than 12 square inches shall be outlined by saw cuts at least 1 inch deep. Defective areas less than 12 square inches shall be outlined by a 1 inch deep cut with a core drill in lieu of sawing. All saw cuts shall be straight lines in a rectangular pattern in line with the formwork panels. After concrete removal, the surface shall be thoroughly cleaned by high pressure washing to remove all loose material. Surfaces shall be kept continually saturated for the first 12 of the 24 hours immediately before placing mortar and shall be damp but not wet at the time of commencing mortar placement. The Contractor, at his option, may use either hand-placed mortar or mortar placed with a mortar gun. If hand-placed mortar is used, the edges of the cut shall be perpendicular to the surface of the concrete. The prepared area shall be brush-coated with a thin coat of neat cement grout. The repair shall then be made using a stiff mortar, preshrunk by allowing the mixed mortar to stand for 30 to 45 minutes and then remixed, thoroughly tamped into place in thin layers. If hand-placed mortar is used, the Contractor shall test each repair area for drumminess by firm tapping with a hammer and shall inspect for cracks, both in the presence of the Contracting Officer's representative, immediately before completion of the contract, and shall replace any showing drumminess or cracking. If mortar placed with a mortar gun is used, the gun shall be a small compressed air-operated gun to which the mortar is slowly hand fed and which applies the mortar to the surface as a high-pressure stream, as approved. Repairs made using shotcrete equipment will not be accepted. The mortar used shall be the same mortar as specified for damp-pack mortar repair. If gun-placed mortar is used, the edges of the cut shall be beveled toward the center at a slope of 1:1. All surface applied mortar repairs shall be continuously moist cured for at least 7 days. Moist curing shall consist of several layers of saturated burlap applied to the surface immediately after placement is complete and covered with polyethylene sheeting, all held closely in place by a sheet of plywood or similar material rigidly braced against it. Burlap shall be kept continually wet.

3.8.2.2 Repair of Deep and Large Defects

Deep and large defects will be those that are more than 6 inches deep and also have an average diameter at the surface more than 18 inches or that are otherwise so identified by the Project Office. Such defects shall be repaired as specified herein or directed, except that defects which affect the strength of the structure shall not be repaired and that portion of the structure shall be completely removed and replaced. Deep and large defects shall be repaired by procedures approved in advance including forming and placing special concrete using applied pressure during hardening. Preparation of the repair area shall be as specified for surface application of mortar. In addition, the top edge (surface) of the repair area shall be sloped at approximately 20 degrees from the horizontal, upward toward the side from which concrete will be placed. The special concrete shall be a concrete mixture with low water content and low slump, and shall be allowed to age 30 to 60 minutes before use. Concrete containing a specified expanding admixture may be used in lieu of the above mixture; the paste portion of such concrete mixture shall be designed to have an expansion between 2.0 and 4.0 percent when tested in accordance with ASTM C 940. A full width "chimney" shall be provided at the top of the form on the placing side to ensure filling to the top of the opening. A pressure cap shall be used on the concrete in the chimney with simultaneous tightening and revibrating the form during hardening to ensure a tight fit for the

repair. The form shall be removed after 24 hours and immediately the chimney shall be carefully chipped away to avoid breaking concrete out of the repair; the surface of the repair concrete shall be dressed as required.

3.9 FINISHING UNFORMED SURFACES

The finish of all unformed surfaces shall meet the requirements of paragraph Tolerances in PART 1, when tested as specified herein.

3.9.1 General

The ambient temperature of spaces adjacent to unformed surfaces being finished and of the base on which concrete will be placed shall be not less than 50 degrees F. In hot weather all requirements of paragraphs Hot Weather Requirements and Prevention of Plastic Shrinkage Cracking shall be met. Unformed surfaces that are not to be covered by additional concrete or backfill shall have a float finish, with additional finishing as specified below, and shall be true to the elevation shown on the drawings. Surfaces to receive additional concrete or backfill shall be brought to the elevation shown on the drawings, properly consolidated, and left true and regular. Unless otherwise shown on the drawings, exterior surfaces shall be sloped for drainage, as directed. Where drains are provided, interior floors shall be evenly sloped to the drains. Joints shall be carefully made as previously specified. The finished surfaces shall be protected from stains or abrasions. Grate tampers or "jitterbugs" shall not be used for any surfaces. The dusting of surfaces with dry cement or other materials or the addition of any water during finishing shall not be permitted. If bleedwater is present prior to finishing, the excess water shall be carefully dragged off or removed by absorption with porous materials such as burlap. During finishing operations, extreme care shall be taken to prevent over finishing or working water into the surface; this can cause "crazing" (surface shrinkage cracks which appear after hardening) of the surface. Any slabs with surfaces which exhibit significant crazing shall be removed and replaced. During finishing operations, surfaces shall be checked with a 10 foot straightedge, applied in both directions at regular intervals while the concrete is still plastic, to detect high or low areas.

3.9.2 Exterior Slabs on Grade

Exterior slabs on grade shall be constructed where shown on the drawings. After forms are set and underlying material prepared as specified, the concrete shall be placed uniformly throughout the area and thoroughly vibrated. As soon as placed and vibrated, the concrete shall be struck off and screeded to the crown and cross section and to such elevation above grade that when consolidated and finished, the surface of the pavement will be at the required elevation. The entire surface shall be tamped with the strike off, or consolidated with a vibrating screed, and this operation continued until the required compaction and reduction of internal and surface voids are accomplished. Care shall be taken to prevent bringing excess paste to the surface. Immediately following the final consolidation of the surface, the pavement shall be floated longitudinally from bridges resting on the side forms and spanning but not touching the concrete. If necessary, additional concrete shall be placed and screeded, and the float operated until a satisfactory surface has been produced. The floating operation shall be advanced not more than half the length of the float and then

continued over the new and previously floated surfaces. After finishing is completed but while the concrete is still plastic, minor irregularities and score marks in the pavement surface shall be eliminated by means of long-handled cutting straightedges. Straightedges shall be 12 feet in length and shall be operated from the sides of the pavement and from bridges. A straightedge operated from the side of the pavement shall be equipped with a handle 3 feet longer than one-half the width of the pavement. The surface shall then be tested for trueness with a 12 foot straightedge held in successive positions parallel and at right angles to the center line of the pavement, and the whole area covered as necessary to detect variations. The straightedge shall be advanced along the pavement in successive stages of not more than one-half the length of the straightedge. Depressions shall be immediately filled with freshly mixed concrete, struck off, consolidated, and refinished. Projections above the required elevation shall also be struck off and refinished. The straightedge testing and finishing shall continue until the entire surface of the concrete is true. Before the surface sheen has disappeared and well before the concrete becomes nonplastic, the surface of the pavement shall be given a broom finish which has been previously demonstrated and approved by the Contracting Officer. Edges and joints shall be rounded with an edger having a radius of 1/8 inch. Curing shall be as specified.

3.9.3 Floated Finish

Slabs to receive more than a rough slab finish shall next be given a wood float finish. The screeding shall be followed immediately by darbying or bull floating before bleeding water is present, to bring the surface to a true, even plane. Then, after the concrete has stiffened so that it will withstand a man's weight without imprint of more than 1/4 inch and the water sheen has disappeared, it shall be floated to a true and even plane free of ridges. Floating shall be performed by use of suitable hand floats or power driven equipment. Sufficient pressure shall be used on the floats to bring a film of moisture to the surface. Hand floats shall be made of wood, magnesium, or aluminum. Lightweight concrete or concrete that exhibits stickiness shall be floated with a magnesium float. Care shall be taken to prevent over-finishing or incorporating water into the surface.

3.9.4 Curing and Protection

Concrete shall be cured by an approved method for a period of 7 days. Immediately after placement, concrete shall be protected from premature drying, extremes in temperatures, rapid temperature change, mechanical injury and damage from rain and flowing water for the duration of the curing period. Air and forms in contact with concrete shall be maintained at a temperature above 50 degrees F for the first 3 days and at a temperature above 32 degrees F for the remainder of the specified curing period. Exhaust fumes from combustion heating units shall be vented to the outside of the enclosure, and heaters and ducts shall be placed and directed so as not to cause areas of overheating and drying of concrete surfaces or to create fire hazards. Materials and equipment needed for adequate curing and protection shall be available and at the site prior to placing concrete. No fire or excessive heat, including welding, shall be permitted near or in direct contact with the concrete at any time. Except as otherwise permitted by paragraph Membrane Forming Curing Compounds, moist curing shall be provided for any areas to receive floor hardener, any paint or other applied coating, or to

which other concrete is to be bonded. Concrete containing silica fume shall be initially cured by fog misting during finishing, followed immediately by continuous moist curing. Impervious sheeting shall not be used for curing.

3.10 CURING

3.10.1 Moist Curing

Concrete to be moist-cured shall be maintained continuously wet for the entire curing period, commencing immediately after finishing. If water or curing materials used stain or discolor concrete surfaces which are to be permanently exposed, the concrete surfaces shall be cleaned as approved. When wooden forms are left in place during curing, they shall be kept wet at all times. If steel forms are used in hot weather, nonsupporting vertical forms shall be broken loose from the concrete soon after the concrete hardens and curing water continually applied in this void. If the forms are removed before the end of the curing period, curing shall be carried out as on unformed surfaces, using suitable materials. Surfaces shall be cured by ponding, by continuous sprinkling, by continuously saturated burlap or cotton mats, or by continuously saturated plastic coated burlap. Burlap and mats shall be clean and free from any contamination and shall be completely saturated before being placed on the concrete. The Contractor shall have an approved work system to ensure that moist curing is continuous 24 hours per day.

3.10.2 Membrane Forming Curing Compounds

Membrane forming curing compounds shall not be used on surfaces that are to receive any subsequent treatment depending on adhesion or bonding to the concrete, including surfaces to which a smooth finish is to be applied or other concrete to be bonded. However, a styrene acrylate or chlorinated rubber compound meeting ASTM C 309, Class B requirements, may be used for surfaces which are to be painted or are to receive bituminous roofing or waterproofing, or floors that are to receive adhesive applications of resilient flooring. The curing compound selected shall be compatible with any subsequent paint, roofing, waterproofing or flooring specified. Membrane curing compound shall not be used on surfaces that are maintained at curing temperatures with free steam. Curing compound shall be applied to formed surfaces immediately after the forms are removed and prior to any patching or other surface treatment except the cleaning of loose sand, mortar, and debris from the surface. All surfaces shall be thoroughly moistened with water. Curing compound shall be applied to slab surfaces as soon as the bleeding water has disappeared, with the tops of joints being temporarily sealed to prevent entry of the compound and to prevent moisture loss during the curing period. The curing compound shall be applied in a two-coat continuous operation by approved motorized power-spraying equipment operating at a minimum pressure of 75 psi, at a uniform coverage of not more than 400 square feet per gallon for each coat, and the second coat shall be applied perpendicular to the first coat. Concrete surfaces which have been subjected to rainfall within 3 hours after curing compound has been applied shall be resprayed by the method and at the coverage specified. Surfaces on which clear compound is used shall be shaded from direct rays of the sun for the first 3 days. Surfaces coated with curing compound shall be kept free of foot and vehicular traffic, and from other sources of abrasion and contamination during the curing period.

3.10.3 Impervious Sheeting

Except for plastic coated burlap, impervious sheeting alone shall not be used for curing. Impervious-sheet curing shall only be used on horizontal or nearly horizontal surfaces. Surfaces shall be thoroughly wetted and be completely covered with the sheeting. Sheeting shall be at least 18 inches wider than the concrete surface to be covered. Covering shall be laid with light-colored side up. Covering shall be lapped not less than 12 inches and securely weighted down or shall be lapped not less than 4 inches and taped to form a continuous cover with completely closed joints. The sheet shall be weighted to prevent displacement so that it remains in contact with the concrete during the specified length of curing. Coverings shall be folded down over exposed edges of slabs and secured by approved means. Sheets shall be immediately repaired or replaced if tears or holes appear during the curing period.

3.10.4 Cold Weather Curing and Protection

When the daily ambient low temperature is less than 32 degrees F the temperature of the concrete shall be maintained above 40 degrees F for the first seven days after placing. During the period of protection removal, the air temperature adjacent to the concrete surfaces shall be controlled so that concrete near the surface will not be subjected to a temperature differential of more than 25 degrees F as determined by suitable temperature measuring devices furnished by the Government, as required, and installed adjacent to the concrete surface and 2 inches inside the surface of the concrete. The installation of the thermometers shall be made by the Contractor as directed.

3.11 SETTING BASE PLATES AND BEARING PLATES

After being properly positioned, column base plates, bearing plates for beams and similar structural members, and machinery and equipment base plates shall be set to the proper line and elevation with damp-pack bedding mortar, except where nonshrink grout is indicated. The thickness of the mortar or grout shall be approximately 1/24 the width of the plate, but not less than 3/4 inch. Concrete and metal surfaces in contact with grout shall be clean and free of oil and grease, and concrete surfaces in contact with grout shall be damp and free of laitance when grout is placed.

3.11.1 Nonshrink Grout

Nonshrink grout shall be a ready-mixed material requiring only the addition of water. Water content shall be the minimum that will provide a flowable mixture and completely fill the space to be grouted without segregation, bleeding, or reduction of strength.

3.11.1.1 Mixing and Placing of Nonshrink Grout

Mixing and placing shall be in conformance with the material manufacturer's instructions and as specified therein. Ingredients shall be thoroughly dry-mixed before adding water. After adding water, the batch shall be mixed for 3 minutes. Batches shall be of size to allow continuous placement of freshly mixed grout. Grout not used within 30 minutes after mixing shall be discarded. The space between the top of the concrete or machinery-bearing surface and the plate shall be filled

solid with the grout. Forms shall be of wood or other equally suitable material for completely retaining the grout on all sides and on top and shall be removed after the grout has set. The placed grout shall be carefully worked by rodding or other means to eliminate voids; however, overworking and breakdown of the initial set shall be avoided. Grout shall not be retempered or subjected to vibration from any source. Where clearances are unusually small, placement shall be under pressure with a grout pump. Temperature of the grout, and of surfaces receiving the grout, shall be maintained at 65 to 85 degrees F until after setting.

3.11.1.2 Treatment of Exposed Surfaces

For metal-oxidizing nonshrink grout, exposed surfaces shall be cut back 1 inch and immediately covered with a parge coat of mortar consisting of 1 part portland cement and 2-1/2 parts fine aggregate by weight, with sufficient water to make a plastic mixture. The parge coat shall have a smooth finish. For other mortars or grouts, exposed surfaces shall have a smooth-dense finish and be left untreated. Curing shall comply with paragraph CURING.

3.12 TESTING AND INSPECTION FOR CONTRACTOR QUALITY CONTROL

The Contractor shall perform the inspection and tests described below and, based upon the results of these inspections and tests, shall take the action required and shall submit specified reports. When, in the opinion of the Contracting Officer, the concreting operation is out of control, concrete placement shall cease and the operation shall be corrected. The laboratory performing the tests shall be onsite and shall conform with ASTM C 1077. Materials may be subjected to check testing by the Government from samples obtained at the manufacturer, at transfer points, or at the project site. The Government will inspect the laboratory, equipment, and test procedures prior to start of concreting operations and at least once during the contract execution and thereafter at the option of the Government for conformance with ASTM C 1077.

3.12.1 Grading and Corrective Action

3.12.1.1 Fine Aggregate

At least once during each shift when the concrete plant is operating, there shall be one sieve analysis and fineness modulus determination in accordance with ASTM C 136 and COE CRD-C 104 for the fine aggregate or for each fine aggregate if it is batched in more than one size or classification. The location at which samples are taken may be selected by the Contractor as the most advantageous for control. However, the Contractor is responsible for delivering fine aggregate to the mixer within specification limits. When the amount passing on any sieve is outside the specification limits, the fine aggregate shall be immediately resampled and retested. If there is another failure on any sieve, the fact shall immediately reported to the Contracting Officer, concreting shall be stopped, and immediate steps taken to correct the grading.

3.12.1.2 Coarse Aggregate

At least once during each shift in which the concrete plant is operating, there shall be a sieve analysis in accordance with ASTM C 136 for each size of coarse aggregate. The location at which samples are

taken may be selected by the Contractor as the most advantageous for production control. However, the Contractor shall be responsible for delivering the aggregate to the mixer within specification limits. A test record of samples of aggregate taken at the same locations shall show the results of the current test as well as the average results of the five most recent tests including the current test. The Contractor may adopt limits for control coarser than the specification limits for samples taken other than as delivered to the mixer to allow for degradation during handling. When the amount passing any sieve is outside the specification limits, the coarse aggregate shall be immediately resampled and retested. If the second sample fails on any sieve, that fact shall be reported to the Contracting Officer. Where two consecutive averages of 5 tests are outside specification limits, the operation shall be considered out of control and shall be reported to the Contracting Officer. Concreting shall be stopped and immediate steps shall be taken to correct the grading.

3.12.2 Quality of Aggregates

Thirty days prior to the start of concrete placement, the Contractor shall perform all tests for aggregate quality required by ASTM C 33. In addition, after the start of concrete placement, the Contractor shall perform tests for aggregate quality at least every three months, and when the source of aggregate or aggregate quality changes. Samples tested after the start of concrete placement shall be taken immediately prior to entering the concrete mixer.

3.12.3 Scales, Batching and Recording

The accuracy of the scales shall be checked by test weights prior to start of concrete operations and at least once every three months. Such tests shall also be made as directed whenever there are variations in properties of the fresh concrete that could result from batching errors. Once a week the accuracy of each batching and recording device shall be checked during a weighing operation by noting and recording the required weight, recorded weight, and the actual weight batched. At the same time, the Contractor shall test and ensure that the devices for dispensing admixtures are operating properly and accurately. When either the weighing accuracy or batching accuracy does not comply with specification requirements, the plant shall not be operated until necessary adjustments or repairs have been made. Discrepancies in recording accuracies shall be corrected immediately.

3.12.4 Batch-Plant Control

The measurement of concrete materials including cementitious materials, each size of aggregate, water, and admixtures shall be continuously controlled. The aggregate weights and amount of added water shall be adjusted as necessary to compensate for free moisture in the aggregates. The amount of air-entraining agent shall be adjusted to control air content within specified limits. A report shall be prepared indicating type and source of cement used, type and source of pozzolan or slag used, amount and source of admixtures used, aggregate source, the required aggregate and water weights per cubic yard, amount of water as free moisture in each size of aggregate, and the batch aggregate and water weights per cubic yard for each class of concrete batched during each day's plant operation.

3.12.5 Concrete Mixture

a. Air Content Testing. Air content tests shall be made when test specimens are fabricated. In addition, at least two tests for air content shall be made on randomly selected batches of each separate concrete mixture produced during each 8-hour period of concrete production. Additional tests shall be made when excessive variation in workability is reported by the placing foreman or Government inspector. Tests shall be made in accordance with ASTM C 231 for normal weight concrete.

b. Air Content Corrective Action. Whenever the air content falls outside the limits indicated above, the air content shall be considered out of control and the concreting operation shall immediately be halted until the air content is under control. Additional air content tests shall be made when concreting is restarted.

c. Slump Testing. In addition to slump tests which shall be made when test specimens are fabricated, at least four slump tests shall be made on randomly selected batches in accordance with ASTM C 143/C 143M for each separate concrete mixture produced during each 8-hour or less period of concrete production each day. Also, additional tests shall be made when excessive variation in workability is reported by the placing foreman or Government inspector.

d. Slump Corrective Action. Whenever slump fall outside the limits indicated above, the slump shall be considered out of control and the concreting operation shall immediately be halted. The Contractor shall take appropriate steps to bring the slump under control and additional slump tests shall be made when concreting is restarted.

e. Temperature. The temperature of the concrete shall be measured when compressive strength specimens are fabricated. Measurement shall be in accordance with ASTM C 1064/C 1064M. The temperature shall be reported along with the compressive strength data.

f. Strength Specimens. At least one set of test specimens shall be made, for compressive or flexural strength as appropriate, on each different concrete mixture placed during the day for each 500 cubic yards or portion thereof of that concrete mixture placed each day. Additional sets of test specimens shall be made, as directed by the Contracting Officer, when the mixture proportions are changed or when low strengths have been detected. A truly random (not haphazard) sampling plan shall be developed by the Contractor and approved by the Contracting Officer prior to the start of construction. The plan shall assure that sampling is done in a completely random and unbiased manner. A set of test specimens for concrete with a 28-day specified strength per paragraph Strength Requirements in PART 1 shall consist of four specimens, two to be tested at 7 days and two at 28 days. Test specimens shall be molded and cured in accordance with ASTM C 31/C 31M and tested in accordance with ASTM C 39/C 39M for test cylinders and ASTM C 78 for test beams. Results of all strength tests shall be reported immediately to the Contracting Officer. Quality control charts shall be kept for individual strength "tests", ("test" as defined in paragraph

Strength Requirements in PART 1) moving average of last 3 "tests" for strength, and moving average for range for the last 3 "tests" for each mixture. The charts shall be similar to those found in ACI 214.3R.

3.12.6 Inspection Before Placing

Foundations, construction joints, forms, and embedded items shall be inspected by the Contractor in sufficient time prior to each concrete placement in order to certify to the Contracting Officer that they are ready to receive concrete. The results of each inspection shall be reported in writing.

3.12.7 Placing

The placing foreman shall supervise placing operations, shall determine that the correct quality of concrete or grout is placed in each location as specified and as directed by the Contracting Officer, and shall be responsible for measuring and recording concrete temperatures and ambient temperature hourly during placing operations, weather conditions, time of placement, volume placed, and method of placement. The placing foreman shall not permit batching and placing to begin until it has been verified that an adequate number of vibrators in working order and with competent operators are available. Placing shall not be continued if any pile of concrete is inadequately consolidated. If any batch of concrete fails to meet the temperature requirements, immediate steps shall be taken to improve temperature controls.

3.12.8 Vibrators

The frequency and amplitude of each vibrator shall be determined in accordance with COE CRD-C 521 prior to initial use and at least once a month when concrete is being placed. Additional tests shall be made as directed when a vibrator does not appear to be adequately consolidating the concrete. The frequency shall be determined while the vibrator is operating in concrete with the tachometer being held against the upper end of the vibrator head while almost submerged and just before the vibrator is withdrawn from the concrete. The amplitude shall be determined with the head vibrating in air. Two measurements shall be taken, one near the tip and another near the upper end of the vibrator head, and these results averaged. The make, model, type, and size of the vibrator and frequency and amplitude results shall be reported in writing. Any vibrator not meeting the requirements of paragraph Consolidation, shall be immediately removed from service and repaired or replaced.

3.12.9 Curing Inspection

a. Moist Curing Inspections. At least once each shift, and not less than twice per day on both work and non-work days, an inspection shall be made of all areas subject to moist curing. The surface moisture condition shall be noted and recorded.

b. Moist Curing Corrective Action. When a daily inspection report lists an area of inadequate curing, immediate corrective action shall be taken, and the required curing period for those areas shall be extended by 1 day.

c. Membrane Curing Inspection. No curing compound shall be applied

until the Contractor has verified that the compound is properly mixed and ready for spraying. At the end of each operation, the Contractor shall estimate the quantity of compound used by measurement of the container and the area of concrete surface covered, shall compute the rate of coverage in square feet per gallon, and shall note whether or not coverage is uniform.

d. Membrane Curing Corrective Action. When the coverage rate of the curing compound is less than that specified or when the coverage is not uniform, the entire surface shall be sprayed again.

e. Sheet Curing Inspection. At least once each shift and once per day on non-work days, an inspection shall be made of all areas being cured using impervious sheets. The condition of the covering and the tightness of the laps and tapes shall be noted and recorded.

f. Sheet Curing Corrective Action. When a daily inspection report lists any tears, holes, or laps or joints that are not completely closed, the tears and holes shall promptly be repaired or the sheets replaced, the joints closed, and the required curing period for those areas shall be extended by 1 day.

3.12.10 Cold-Weather Protection

At least once each shift and once per day on non-work days, an inspection shall be made of all areas subject to cold-weather protection. Any deficiencies shall be noted, corrected, and reported.

3.12.11 Mixer Uniformity

a. Stationary Mixers. Prior to the start of concrete placing and once every 6 months when concrete is being placed, or once for every 75,000 cubic yards of concrete placed, whichever results in the shortest time interval, uniformity of concrete mixing shall be determined in accordance with ASTM C 94/C 94M.

b. Truck Mixers. Prior to the start of concrete placing and at least once every 6 months when concrete is being placed, uniformity of concrete mixing shall be determined in accordance with ASTM C 94/C 94M. The truck mixers shall be selected randomly for testing. When satisfactory performance is found in one truck mixer, the performance of mixers of substantially the same design and condition of the blades may be regarded as satisfactory.

c. Mixer Uniformity Corrective Action. When a mixer fails to meet mixer uniformity requirements, either the mixing time shall be increased, batching sequence changed, batch size reduced, or adjustments shall be made to the mixer until compliance is achieved.

3.12.12 Reports

All results of tests or inspections conducted shall be reported informally as they are completed and in writing daily. A weekly report shall be prepared for the updating of control charts covering the entire

period from the start of the construction season through the current week. During periods of cold-weather protection, reports of pertinent temperatures shall be made daily. These requirements do not relieve the Contractor of the obligation to report certain failures immediately as required in preceding paragraphs. Such reports of failures and the action taken shall be confirmed in writing in the routine reports. The Contracting Officer has the right to examine all contractor quality control records.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 05 - METALS

SECTION 05090

WELDING, STRUCTURAL

PART 1 GENERAL

1.1 REFERENCES
1.2 DEFINITIONS
1.3 GENERAL REQUIREMENTS
1.3.1 Pre-erection Conference
1.3.2 Mock-up Model
1.4 SUBMITTALS
1.5 WELDING PROCEDURE QUALIFICATIONS
1.5.1 Previous Qualifications
1.5.2 Prequalified Procedures
1.5.3 Retests
1.6 WELDER, WELDING OPERATOR, AND TACKER QUALIFICATION
1.6.1 Previous Personnel Qualifications
1.6.2 Certificates
1.6.3 Renewal of Qualification
1.7 INSPECTOR QUALIFICATION
1.8 SYMBOLS
1.9 SAFETY

PART 2 PRODUCTS

2.1 WELDING EQUIPMENT AND MATERIALS

PART 3 EXECUTION

3.1 WELDING OPERATIONS
3.1.1 Requirements
3.1.2 Identification
3.2 QUALITY CONTROL
3.3 STANDARDS OF ACCEPTANCE
3.3.1 Nondestructive Examination
3.3.2 Destructive Tests
3.4 GOVERNMENT INSPECTION AND TESTING
3.5 CORRECTIONS AND REPAIRS

-- End of Section Table of Contents --

SECTION 05090

WELDING, STRUCTURAL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC ASD Spec S335	(1989) Specification for Structural Steel Buildings - Allowable Stress Design, Plastic Design

AMERICAN SOCIETY FOR NONDESTRUCTIVE TESTING (ASNT)

ASNT RP SNT-TC-1A	(1996) Recommended Practice SNT-TC-1A

AMERICAN WELDING SOCIETY (AWS)

AWS A2.4	(1998) Standard Symbols for Welding, Brazing and Nondestructive Examination
AWS A3.0	(1994) Standard Welding Terms and Definitions
AWS D1.1	(2000) Structural Welding Code - Steel
AWS Z49.1	(1999) Safety in Welding and Cutting and Allied Processes

1.2 DEFINITIONS

Definitions of welding terms shall be in accordance with AWS A3.0.

1.3 GENERAL REQUIREMENTS

The design of welded connections shall conform to AISC ASD Spec S335 unless otherwise indicated or specified. Material with welds will not be accepted unless the welding is specified or indicated on the drawings or otherwise approved. Welding shall be as specified in this section, except where additional requirements are shown on the drawings or are specified in other sections. Welding shall not be started until welding procedures, inspectors, nondestructive testing personnel, welders, welding operators, and tackers have been qualified and the submittals approved by the Contracting Officer. Qualification testing shall be performed at or near the work site. Each Contractor performing welding shall maintain records of the test results obtained in welding procedure, welder, welding operator, and tacker performance qualifications.

1.3.1 Pre-erection Conference

A pre-erection conference shall be held, prior to the start of the field welding, to bring all affected parties together and to gain a naturally clear understanding of the project and the Welding Procedure Specifications (WPS) (which the Contractor shall develop and submit for all welding, including welding done using prequalified procedures). Attendees shall include all Contractor's welding production and inspection personnel and appropriate Government personnel. Items for discussion could include: responsibilities of various parties; welding procedures and processes to be followed; welding sequence (both within a joint and joint sequence within the building); inspection requirements and procedures, both visual and ultrasonic; welding schedule; fabrication of mock-up model; and other items deemed necessary by the attendees.

1.3.2 Mock-up Model

The field-welded connection designated as the mock-up model on the drawings shall be the first connection made. All welders qualified and designated to perform field-welded groove joints shall be present during the welding of the mock-up model connections and each one shall perform a part of the welding. The mock-up test shall simulate the physical and environmental conditions that will be encountered during the welding of all groove joints. All inspection procedures required for groove welded joints, including NDE tests, shall be performed on the mock-up model. All Contractor inspection and testing personnel that will perform QC of groove welded joints shall be present during the welding of the mock-up model and each one shall perform the inspection procedures to be performed on production welding of these joints. This mock-up model connection shall be the standard of performance, both for the welding and inspection procedures used and the results to be achieved in the production welding for these groove welded joints.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Welding Procedure Qualifications;

Welder, Welding Operator, and Tacker Qualification;

Inspector Qualification;

Previous Qualifications;

Prequalified Procedures;

Copies of the welding procedure specifications; the procedure qualification test records; and the welder, welding operator, or tacker qualification test records.

SD-06 Test Reports

Quality Control;

A quality assurance plan and records of tests and inspections.

1.5 WELDING PROCEDURE QUALIFICATIONS

Except for prequalified (per AWS D1.1) and previously qualified procedures, each Contractor performing welding shall record in detail and shall qualify the welding procedure specification for any welding procedure followed in the fabrication of weldments. Qualification of welding procedures shall conform to AWS D1.1 and to the specifications in this section. Copies of the welding procedure specification and the results of the procedure qualification test for each type of welding which requires procedure qualification shall be submitted for approval. Approval of any procedure, however, will not relieve the Contractor of the sole responsibility for producing a finished structure meeting all the requirements of these specifications. This information shall be submitted on the forms in Appendix E of AWS D1.1. Welding procedure specifications shall be individually identified and shall be referenced on the detail drawings and erection drawings, or shall be suitably keyed to the contract drawings. In case of conflict between this specification and AWS D1.1, this specification governs.

1.5.1 Previous Qualifications

Welding procedures previously qualified by test may be accepted for this contract without requalification if the following conditions are met:

a. Testing was performed by an approved testing laboratory, technical consultant, or the Contractor's approved quality control organization.

b. The qualified welding procedure conforms to the requirements of this specification and is applicable to welding conditions encountered under this contract.

c. The welder, welding operator, and tacker qualification tests conform to the requirements of this specification and are applicable to welding conditions encountered under this contract.

1.5.2 Prequalified Procedures

Welding procedures which are considered prequalified as specified in AWS D1.1 will be accepted without further qualification. The Contractor shall submit for approval a listing or an annotated drawing to indicate the joints not prequalified. Procedure qualification shall be required for these joints.

1.5.3 Retests

If welding procedure fails to meet the requirements of AWS D1.1, the procedure specification shall be revised and requalified, or at the Contractor's option, welding procedure may be retested in accordance with AWS D1.1. If the welding procedure is qualified through retesting, all test results, including those of test welds that failed to meet the requirements, shall be submitted with the welding procedure.

1.6 WELDER, WELDING OPERATOR, AND TACKER QUALIFICATION

Each welder, welding operator, and tacker assigned to work on this contract shall be qualified in accordance with the applicable requirements of AWS D1.1 and as specified in this section. Welders, welding operators, and tackers who make acceptable procedure qualification test welds will be considered qualified for the welding procedure used.

1.6.1 Previous Personnel Qualifications

At the discretion of the Contracting Officer, welders, welding operators, and tackers qualified by test within the previous 6 months may be accepted for this contract without requalification if all the following conditions are met:

a. Copies of the welding procedure specifications, the procedure qualification test records, and the welder, welding operator, and tacker qualification test records are submitted and approved in accordance with the specified requirements for detail drawings.

b. Testing was performed by an approved testing laboratory, technical consultant, or the Contractor's approved quality control organization.

c. The previously qualified welding procedure conforms to the requirements of this specification and is applicable to welding conditions encountered under this contract.

d. The welder, welding operator, and tacker qualification tests conform to the requirements of this specification and are applicable to welding conditions encountered under this contract.

1.6.2 Certificates

Before assigning any welder, welding operator, or tacker to work under this contract, the Contractor shall submit the names of the welders, welding operators, and tackers to be employed, and certification that each individual is qualified as specified. The certification shall state the type of welding and positions for which the welder, welding operator, or tacker is qualified, the code and procedure under which the individual is qualified, the date qualified, and the name of the firm and person certifying the qualification tests. The certification shall be kept on file, and 3 copies shall be furnished. The certification shall be kept current for the duration of the contract.

1.6.3 Renewal of Qualification

Requalification of a welder or welding operator shall be required under any of the following conditions:

a. It has been more than 6 months since the welder or welding operator has used the specific welding process for which he is qualified.

b. There is specific reason to question the welder or welding operator's ability to make welds that meet the requirements of these specifications.

c. The welder or welding operator was qualified by an employer other than those firms performing work under this contract, and a

qualification test has not been taken within the past 12 months. Records showing periods of employment, name of employer where welder, or welding operator, was last employed, and the process for which qualified shall be submitted as evidence of conformance.

d. A tacker who passes the qualification test shall be considered eligible to perform tack welding indefinitely in the positions and with the processes for which he is qualified, unless there is some specific reason to question the tacker's ability. In such a case, the tacker shall be required to pass the prescribed tack welding test.

1.7 INSPECTOR QUALIFICATION

Inspector qualifications shall be in accordance with AWS D1.1. Nondestructive testing personnel shall be qualified in accordance with the requirements of ASNT RP SNT-TC-1A for Levels I or II in the applicable nondestructive testing method. The inspector may be supported by assistant welding inspectors who are not qualified to ASNT RP SNT-TC-1A, and assistant inspectors may perform specific inspection functions under the supervision of the qualified inspector.

1.8 SYMBOLS

Symbols shall be in accordance with AWS A2.4, unless otherwise indicated.

1.9 SAFETY

Safety precautions during welding shall conform to AWS Z49.1.

PART 2 PRODUCTS

2.1 WELDING EQUIPMENT AND MATERIALS

All welding equipment, electrodes, welding wire, and fluxes shall be capable of producing satisfactory welds when used by a qualified welder or welding operator performing qualified welding procedures. All welding equipment and materials shall comply with the applicable requirements of AWS D1.1.

PART 3 EXECUTION

3.1 WELDING OPERATIONS

3.1.1 Requirements

Workmanship and techniques for welded construction shall conform to the requirements of AWS D1.1 and AISC ASD Spec S335. When AWS D1.1 and the AISC ASD Spec S335 specification conflict, the requirements of AWS D1.1 shall govern.

3.1.2 Identification

Welds shall be identified in one of the following ways:

a. Written records shall be submitted to indicate the location of welds made by each welder, welding operator, or tacker.

b. Each welder, welding operator, or tacker shall be assigned a

number, letter, or symbol to identify welds made by that individual. The Contracting Officer may require welders, welding operators, and tackers to apply their symbol next to the weld by means of rubber stamp, felt-tipped marker with waterproof ink, or other methods that do not cause an indentation in the metal. For seam welds, the identification mark shall be adjacent to the weld at 3 foot intervals. Identification with die stamps or electric etchers shall not be allowed.

3.2 QUALITY CONTROL

Testing shall be done by an approved inspection or testing laboratory or technical consultant; or if approved, the Contractor's inspection and testing personnel may be used instead of the commercial inspection or testing laboratory or technical consultant. The Contractor shall perform visual inspection to determine conformance with paragraph STANDARDS OF ACCEPTANCE. Procedures and techniques for inspection shall be in accordance with applicable requirements of AWS D1.1, except that in radiographic inspection only film types designated as "fine grain," or "extra fine," shall be employed.

3.3 STANDARDS OF ACCEPTANCE

Dimensional tolerances for welded construction, details of welds, and quality of welds shall be in accordance with the applicable requirements of AWS D1.1 and the contract drawings. Nondestructive testing shall be by visual inspection methods. The minimum extent of nondestructive testing shall be random 100 percent of welds or joints, as indicated on the drawings.

3.3.1 Nondestructive Examination

The welding shall be subject to inspection and tests in the mill, shop, and field. Inspection and tests in the mill or shop will not relieve the Contractor of the responsibility to furnish weldments of satisfactory quality. When materials or workmanship do not conform to the specification requirements, the Government reserves the right to reject material or workmanship or both at any time before final acceptance of the structure containing the weldment.

3.3.2 Destructive Tests

When metallographic specimens are removed from any part of a structure, the Contractor shall make repairs. The Contractor shall employ qualified welders or welding operators, and shall use the proper joints and welding procedures, including peening or heat treatment if required, to develop the full strength of the members and joints cut and to relieve residual stress.

3.4 GOVERNMENT INSPECTION AND TESTING

In addition to the inspection and tests performed by the Contractor for quality control, the Government will perform inspection and testing for acceptance to the extent determined by the Contracting Officer. The costs of such inspection and testing will be borne by the Contractor if unsatisfactory welds are discovered, or by the Government if the welds are satisfactory. The work may be performed by the Government's own forces or under a separate contract for inspection and testing. The Government reserves the right to perform supplemental nondestructive and

destructive tests to determine compliance with paragraph STANDARDS OF ACCEPTANCE.

3.5 CORRECTIONS AND REPAIRS

When inspection or testing indicates defects in the weld joints, the welds shall be repaired using a qualified welder or welding operator as applicable. Corrections shall be in accordance with the requirements of AWS D1.1 and the specifications. Defects shall be repaired in accordance with the approved procedures. Defects discovered between passes shall be repaired before additional weld material is deposited. Wherever a defect is removed and repair by welding is not required, the affected area shall be blended into the surrounding surface to eliminate sharp notches, crevices, or corners. After a defect is thought to have been removed, and before rewelding, the area shall be examined by suitable methods to ensure that the defect has been eliminated. Repair welds shall meet the inspection requirements for the original welds. Any indication of a defect shall be regarded as a defect, unless reevaluation by nondestructive methods or by surface conditioning shows that no unacceptable defect is present.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 05 - METALS

SECTION 05093

WELDING PRESSURE PIPING

PART 1 GENERAL

1.1 REFERENCES
1.2 DEFINITIONS
1.3 SUBMITTALS
1.4 GENERAL REQUIREMENTS
1.5 PERFORMANCE
1.6 QUALIFICATIONS
1.6.1 Welding Procedures Qualification
1.6.2 Welder and Welding Operator Performance
1.6.2.1 Certification
1.6.2.2 Identification
1.6.2.3 Renewal of Qualification
1.6.3 Inspection and NDE Personnel
1.6.3.1 Inspector Certification
1.6.3.2 NDE Personnel
1.7 DELIVERY, STORAGE, AND HANDLING
1.7.1 Material Control
1.7.1.1 Damaged Containers
1.7.1.2 Partial Issues
1.7.2 Damaged Materials
1.8 SYMBOLS
1.9 SAFETY

PART 2 PRODUCTS

2.1 WELDING MATERIALS

PART 3 EXECUTION

3.1 WELDING OPERATIONS
3.1.1 Base Metal Preparation
3.1.2 Weld Joint Fit-Up
3.1.3 Preheat and Interpass Temperatures
3.1.4 Production Welding Instructions
3.1.5 Postweld Heat Treatment
3.2 EXAMINATIONS, INSPECTIONS, AND TESTS
3.2.1 Random NDE Testing
3.2.2 Visual Inspection
3.2.3 NDE Testing
3.2.4 Inspection and Tests by the Government
3.3 ACCEPTANCE STANDARDS
3.3.1 Visual
3.3.2 Radiography
3.4 CORRECTIONS AND REPAIRS

-- End of Section Table of Contents --

SECTION 05093

WELDING PRESSURE PIPING

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 NONDESTRUCTIVE TESTING (ASNT)

ASNT RP SNT-TC-1A	(1996) Recommended Practice SNT-TC-1A
ASNT Q&A Bk A	(1996) Question and Answer Book A: Radiographic Test Method; Levels I, II, III (Supplement to Recommended Practice SNT-TC-1A)

ASME INTERNATIONAL (ASME)

ASME B31.1	(1998) Power Piping
ASME BPV I	(1998) Boiler and Pressure Vessel Code; Section I, Power Boilers
ASME BPV II Pt C	(1998) Boiler and Pressure Vessel Code; Section II, Materials, Part C - Specifications for Welding Rods, Electrodes and Filler Metals
ASME BPV V	(1998) Boiler and Pressure Vessel Code; Section V, Nondestructive Examination
ASME BPV IX	(1998) Boiler and Pressure Vessel Code; Section IX, Welding and Brazing Qualifications

AMERICAN WELDING SOCIETY (AWS)

AWS A2.4	(1998) Standard Symbols for Welding, Brazing and Nondestructive Examination
AWS A3.0	(1994) Standard Welding Terms and Definitions
AWS B2.1	(1998) Welding Procedure and Performance Qualification
AWS QC1	(1996) AWS Certification of Welding Inspectors
AWS Z49.1	(1999) Safety in Welding and Cutting and Allied Processes

1.2 DEFINITIONS

Definitions shall be in accordance with AWS A3.0.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Pressure Piping; G

Detail drawings showing location, length, and type of welds; and indicating postweld heat treatment and NDE as required.

SD-03 Product Data

Qualifications; G

Welding procedure qualification.

Welding Operations; G

Detailed procedures which define methods of compliance to contract drawings and specifications. Inspection and material procurement records. System and material testing and certification records. Written records and drawings indicating location of welds made by each welder or welding operator.

SD-07 Certificates

Qualifications; G

Welder and welding operator performance qualification certificates. Welding inspectors and NDE personnel certificates. Qualifications of testing laboratory or the Contractor's quality assurance organization.

1.4 GENERAL REQUIREMENTS

This section covers the welding of pressure piping systems. Deviations from applicable codes, approved procedures, and approved detail drawings will not be permitted without prior written approval. Materials or components with welds made offsite will not be accepted if the welding does not conform to the requirements of this specification, unless otherwise specified. Procedures shall be developed by the Contractor for welding all metals included in the work. Welding shall not be started until welding procedures, welders, and welding operators have been qualified. Qualification testing shall be performed by an approved testing laboratory, or by the Contractor if approved by the Contracting Officer. Costs of such testing shall be borne by the Contractor. The Contracting Officer shall be notified at least 24 hours in advance of the time and place of the tests. When practicable, the qualification tests shall be performed at or near the worksite. The Contractor shall

maintain current records of the test results obtained in the welding procedure, welding operator, welder performance qualifications, and nondestructive examination (NDE) procedures readily available at the site for examination by the Contracting Officer. The procedures for making transition welds between different materials or between plates or pipes of different wall thicknesses shall be qualified. ASME B31.1, requirements for branch connections may be used in lieu of detailed designs. Unless otherwise specified, the choice of welding process shall be the responsibility of the Contractor.

1.5 PERFORMANCE

The Contractor shall be responsible for the quality of all joint preparation, welding, and examination. All materials used in the welding operations shall be clearly identified and recorded. The inspection and testing defined in this specification are minimum requirements. Additional inspection and testing shall be the responsibility of the Contractor when he deems it necessary to achieve the quality required.

1.6 QUALIFICATIONS

Welding procedures, welders, and welding operators previously qualified by test may be accepted for the work without requalification, provided that all of the following conditions are fulfilled:

a. Copies of the welding procedures, the procedure qualification test records, and the welder and welding operator performance qualification test records are submitted and approved in accordance with paragraph SUBMITTALS.

b. Testing was performed by an approved testing laboratory or technical consultant or by the Contractor's approved quality assurance organization.

c. The welding procedures, welders, and welding operators were qualified in accordance with ASME BPV IX, or AWS B2.1, AR-2 level; and base materials, filler materials, electrodes, equipment, and processes conformed to the applicable requirements of this specification.

d. The requirements of paragraph "Renewal of Qualification" below are met and records showing name of employer and period of employment using the process for which qualified are submitted as evidence of conformance.

1.6.1 Welding Procedures Qualification

The Contractor shall record in detail and shall qualify the Welding Procedure Specifications for every proposed welding procedure. Qualification for each welding procedure shall conform to the requirements of ASME B31.1, and to this specification. The welding procedures shall specify end preparation for butt welds including cleaning, alignment, and root openings. Preheat, interpass temperature control, and postheat treatment of welds shall be as required by approved welding procedures, unless otherwise indicated or specified. The type of backing rings or consumable inserts, if used, shall be described and if they are to be removed, the removal process shall be described. Copies of the welding procedure specifications and procedure

qualification test results for each type of welding required shall be submitted in accordance with paragraph SUBMITTALS. Approval of any procedure does not relieve the Contractor of the sole responsibility for producing acceptable welds. Welding procedures shall be identified individually and shall be referenced on the detail drawings or keyed to the contract drawings.

1.6.2 Welder and Welding Operator Performance

Each welder and welding operator assigned to work shall be qualified in accordance with ASME B31.1.

1.6.2.1 Certification

Before assigning welders or welding operators to the work, the Contractor shall provide the Contracting Officer with their names together with certification that each individual is performance-qualified as specified. The certification shall state the type of welding and positions for which each is qualified, the code and procedure under which each is qualified, date qualified, and the firm and individual certifying the qualification tests.

1.6.2.2 Identification

Each particular weld shall be identified with the personal number, letter, or symbol assigned to each welder or welding operator. To identify welds, written records indicating the location of welds made by each welder or welding operator shall be submitted, and each welder or welding operator shall apply the personal mark adjacent to the welds using a rubber stamp or felt-tipped marker with permanent, weatherproof ink or other methods approved by the Contracting Officer that do not deform the metal. For seam welds, identification marks shall be placed adjacent to the welds at 3 foot intervals. Identification by die stamps or electric etchers will not be allowed.

1.6.2.3 Renewal of Qualification

Requalification of a welder or welding operator shall be required under any of the following conditions:

a. When a welder or welding operator has not used the specific welding process for a period of 3 months; the period may be extended to 6 months if the welder or welding operator has been employed on some other welding process.

b. When a welder or welding operator has not welded with any process during a period of 3 months, all the personal qualifications shall be considered expired, including any extended by virtue of a., above.

c. There is specific reason to question the person's ability to make welds that will meet the requirements of the specifications.

d. The welder or welding operator was qualified by an employer, other than those firms performing work under this contract, and a qualification test has not been taken within the preceding 12 months.

e. Renewal of qualification for a specific welding process under

conditions a., b., and d., above, needs to be made on only a single test joint or pipe of any thickness, position, or material to reestablish the welder's or welding operator's qualification for any thickness, position, or material covered under previous qualification.

1.6.3 Inspection and NDE Personnel

All inspection and NDE personnel shall be qualified in accordance with the following requirements.

1.6.3.1 Inspector Certification

Welding inspectors shall be qualified in accordance with AWS QC1.

1.6.3.2 NDE Personnel

NDE personnel shall be certified, and a written procedure for the control and administration of NDE personnel training, examination, and certification shall be established. The procedures shall be based on appropriate specific and general guidelines of training and experience recommended by ASNT RP SNT-TC-1A and ASNT Q&A Bk A .

1.7 DELIVERY, STORAGE, AND HANDLING

All filler metals, electrodes, fluxes, and other welding materials shall be delivered to the site in manufacturers' original packages and stored in a dry space until used. Packages shall be properly labeled and designed to give maximum protection from moisture and to insure safe handling.

1.7.1 Material Control

Materials shall be stored in a controlled access and clean, dry area that is weathertight and is maintained at a temperature recommended by the manufacturer. The materials shall not be in contact with the floor and shall be stored on wooden pallets or cribbing.

1.7.1.1 Damaged Containers

Low-hydrogen steel electrodes shall be stored in their sealed shipping container. If the seal is damaged during shipment or storage, and the damage is not immediately detected, the covered electrodes in that container shall be rebaked in accordance with the manufacturer's instructions prior to issuance or shall be discarded. If a container is damaged in storage and the damage is witnessed, the electrodes from that container shall be immediately placed in a storage oven. The storage oven temperature shall be as recommended by the manufacturer or the welding material specification.

1.7.1.2 Partial Issues

When a container of covered electrodes is opened and only a portion of the content is issued, the remaining portion shall, within 1/2 hour, be placed in a storage oven.

1.7.2 Damaged Materials

Materials which are damaged shall be discarded. Covered electrodes

which are oil or water-soaked, dirty, or on which the flux has separated from the wire shall be discarded.

1.8 SYMBOLS

Symbols shall be in accordance with AWS A2.4.

1.9 SAFETY

Safety precautions shall conform to AWS Z49.1.

PART 2 PRODUCTS

2.1 WELDING MATERIALS

Welding materials shall comply with ASME BPV II Pt C. Welding equipment, electrodes, welding wire, and fluxes shall be capable of producing satisfactory welds when used by a qualified welder or welding operator using qualified welding procedures.

PART 3 EXECUTION

3.1 WELDING OPERATIONS

Welding shall be performed in accordance with qualified procedures using qualified welders and welding operators. Welding shall not be done when the quality of the completed weld could be impaired by the prevailing working or weather conditions. The Contracting Officer shall determine when weather or working conditions are unsuitable for welding. Welding of hangers, supports, and plates to structural members shall conform to SECTION 05090 WELDING, STRUCTURAL.

3.1.1 Base Metal Preparation

Oxy-fuel cutting shall not be used on austenitic stainless steel or nonferrous materials.

3.1.2 Weld Joint Fit-Up

Parts that are to be joined by welding shall be fitted, aligned, and retained in position during the welding operation by the use of bars, jacks, clamps, or other mechanical fixtures. Welded temporary attachments
shall not be used except when it is impractical to use mechanical fixtures. When temporary attachments are used, they shall be the same material as the base metal, and shall be completely removed by grinding or
thermal cutting after the welding operation is completed. If thermal cutting is used, the attachment shall be cut to not less than 1/4 inch from the member and the balance removed by grinding. After the temporary attachment has been removed, the area shall be visually examined.

3.1.3 Preheat and Interpass Temperatures

Preheat temperatures shall meet the requirements specified by ASME B31.1. However, in no case shall the preheat be below 50 degrees F for ferritic steel or austenitic stainless steel, or 32 degrees F for nonferrous alloys. The maximum interpass temperatures shall not exceed 300 degrees F

for austenitic stainless steels, nickel alloys, and copper alloys; and 500
degrees F for carbon steels. Preheat techniques shall be such as to ensure that the full thickness of the weld joint preparation and/or adjacent base
material, at least 3 inches in all directions, is at the specified temperature. Preheating by induction or resistance methods is preferred. When flame heating is used, only a neutral flame shall be employed. Oxy-fuel heating shall not be used on austenitic stainless steel or nickel-alloy materials; however, air-fuel heating is acceptable if controlled to insure that the surface temperature does not exceed 150 degrees F. Interpass temperatures shall be checked on the surface of the component within 1 inch of the weld groove and at the starting location of
the next weld pass, and for a distance of about 6 inches ahead of the weld,but not on the area to be welded.

3.1.4 Production Welding Instructions

a. Welding shall not be done when the ambient temperature is lower than 0 degree F.

b. Welding is not permitted on surfaces that are wet or covered with ice, when snow or rain is falling on the surfaces to be welded, or during periods of high winds, unless the welders and the work are properly protected.

c. Gases for purging and shielding shall be welding grade and shall have a dew point of minus 40 degrees F or lower.

d. Back purges are required for austenitic stainless steels and nonferrous alloys welded from one side and shall be set up such that the flow of gas from the inlet to the outlet orifice passes across the area to be welded. The oxygen content of the gas exiting from the purge vent shall be less than 2 percent prior to welding.

e. The purge on groove welds shall be maintained for at least three layers or 3/16 inch.

f. Removable purge dam materials shall be made of expandable or flexible plugs, such as plexiglass, plywood (which shall be dry when used), etc. Wood dams shall be kiln-dried quality. Nonremovable purge dams and purge dam adhesives shall be made of water soluble materials. Purge dams shall not be made of polyvinyl alcohol.

g. Any welding process which requires the use of external gas shielding shall not be done in a draft or wind unless the weld area is protected by a shelter. This shelter shall be of material and shape appropriate to reduce wind velocity in the vicinity of the weld to a maximum of 5 mph (440 fpm).

h. Welding of low-alloy and hardenable high-alloy steels may be interrupted provided a minimum of at least 3/8 inch thickness of weld deposit or 25 percent of the weld groove is filled, whichever is greater, and the preheat temperature is maintained during the time that welding is interrupted. If the temperature falls below the minimum preheat temperature before all welding

has been completed on a joint, or, where required, before post weld heat treatment, a liquid penetrant or magnetic particle examination shall be performed to insure sound deposited metal before reheating. Welding of other materials may be interrupted without restriction provided a visual inspection is performed before welding is resumed.

i. Tack welds to be incorporated in the final welds shall have their ends tapered by grinding or welding technique. Tack welds that are cracked or defective shall be removed and the groove shall be retacked prior to welding. Temporary tack welds shall be removed, the surface ground smooth, and visually inspected. For low-alloy and hardenable high-alloy steels, the area shall be magnetic particle examination inspected.

j. When joining ferritic steel pressure piping components to austenitic stainless steel pressure piping components and postweld heat treatment is required, the following requirements apply:

1. The weld-end preps of ferritic steel components, which are to be welded to austenitic stainless steel, shall be buttered with one of the following weld filler metals and shall conform to the specified requirements:

ASME BPV II Pt C, SFA 5.14, Classification ERNiCr-3.

ASME BPV II Pt C, SFA 5.11, Classification ENiCrFe-2.

2. The ferritic steel weld-end prep shall be buttered, receive a postweld heat treatment as required by ASME B31.1, and then be machined with the applicable weld-end preparation. After machining, the buttered layer shall be a minimum of 1/4 inch thick.

3. Pressure piping transition joints shall be completed using ERNiCr-3 or ENiCrFe-2 weld filler metals. No further postweld heat treatment shall be performed.

k. When joining ferritic steel pressure piping components to austenitic stainless steel pressure piping components and postweld heat treatment is not required, prepare and weld the joint using either ERNiCr-3 or ENiCrFe-2 filler metals. For service temperatures of 200 degrees F or less, stainless filler metal 309 ASME BPV II Pt C, SFA 5.4 or 5.9 is permissible in lieu of the nickel-based alloys.

l. Grinding of completed welds is to be performed only to the extent required for NDE, including any inservice examination, and to provide weld reinforcement within the requirements of ASME B31.1. If the surface of the weld requires grinding, reducing the weld or base material below the minimum required thickness shall be avoided. Minimum weld external reinforcement shall be flush between external surfaces.

3.1.5 Postweld Heat Treatment

Postweld heat treatment shall be performed in accordance with ASME B31.1. Temperatures for local postweld heat treatment shall be measured

continuously by thermocouples in contact with the weldment.

Postweld heat treatment of low-alloy steels, when required, shall be performed immediately upon completion of welding and prior to the temperature of the weld falling below the preheat temperature. However, postweld heat treatment may be postponed after the completion of the weld, if, immediately after the weld is completed, it is maintained at a minimum temperature of 300 degrees F or the preheat temperature, whichever is greater, for 2 hours per inch of weld thickness.

For low-alloy steels, the cooling rates shall be such that temper embrittlement is avoided.

3.2 EXAMINATIONS, INSPECTIONS, AND TESTS

Visual and NDE shall be performed by the Contractor to detect surface and internal discontinuities in completed welds. The services of a qualified commercial inspection or testing laboratory or technical consultant, approved by the Contracting Officer, shall be employed by the Contractor. All tack welds, weld passes, and completed welds shall be 100% visually inspected for all welded steam, condensate and steam trace lines. Radiographic examination shall be required as indicated in TABLE I. When inspection and testing indicates defects in a weld joint, the weld shall be repaired by a qualified welder in accordance with paragraph CORRECTIONS AND REPAIRS.

TABLE I. MANDATORY MINIMUM NONDESTRUCTIVE EXAMINATIONS

Type Weld	Piping Service Conditions and Nondestructive Test	
	Steam Lines (Temperatures between 350 degrees F and 750 degrees F inclusive.)	All others.
Butt Welds (Girth and Longitudinal)	RT 10 percent for all sizes, thicknesses and passes.	100% visual for all sizes, thicknesses, and passes.
Welded Branch Connections (Size indicated is branch size) (See Note 7)	RT 10 percent for all sizes, thicknesses and passes.	100% visual for all sizes, thicknesses, and passes.
Fillet, Socket Attachment and Seal Welds	Visual for all sizes, thicknesses and passes.	100% visual for all sizes, thicknesses and passes.

TABLE I. MANDATORY MINIMUM NONDESTRUCTIVE EXAMINATIONS

Type Weld	Piping Service Conditions and Nondestructive Test

NOTES TO TABLE I

1. All welds must be given a visual examination in addition to type of specific nondestructive examination specified.

2. RT - Radiographic examination.

3. RT of branch welds shall be performed before any nonintegral reinforcing material is applied.

4. The thickness of butt welds is defined as the thicker of the two abutting ends after end preparation.

5. Temperatures and pressures shown are design.

6. For nondestructive examination of the pressure retaining component, refer to the standards listed in applicable code or the manufacturing specifications.

3.2.1 Random NDE Testing

When random radiographic examination is required, the Contractor shall test a minimum of 10 percent of the total length or number of piping welds. The welds inspected shall be selected randomly, but the selection shall include an examination of welds made by each welding operator or welder. The welds inspected shall be also be representative of all pipe sizes, including field welds, regardless of pipe wall thickness. If the random testing reveals that any welds fail to meet minimum quality requirements, an additional 10 percent of the welds in that same group shall be inspected. If all of the additional welds inspected meet the quality requirements, the entire group of welds represented shall be accepted and the defective welds shall be repaired. If any of the additional welds inspected also fail to meet the quality requirements, that entire group of welds shall be rejected. The rejected welds shall be removed and rewelded, or the rejected welds shall be 100 percent inspected and all defective weld areas removed and rewelded.

3.2.2 Visual Inspection

Weld joints shall be inspected visually as follows:

a. Before welding - 100 percent of the total length or number of piping welds shall be inspected for compliance with requirements for joint preparation, placement of backing rings or consumable inserts, alignment and fit-up, and cleanliness.

b. During welding - 100 percent of the total length or number of each pass of piping welds shall be inspected for cracks and conformance to the qualified welding procedure.

c. After welding - 100 percent of piping welds shall be inspected for cracks, contour and finish, bead reinforcement,

undercutting, overlap, and size of fillet welds.

3.2.3 NDE Testing

NDE shall be in accordance with written procedures. Procedures for radiographic tests and methods shall conform to ASME BPV V. The approved procedure shall be demonstrated to the satisfaction of the Contracting Officer. In addition to the information required in ASME BPV V, the written procedures shall include the timing of the NDE in relation to the welding operations and safety precautions.

3.2.4 Inspection and Tests by the Government

The Government will perform inspection and supplemental nondestructive or destructive tests as deemed necessary. The cost of supplemental NDE will be borne by the Government. The correction and repair of defects and the reexamination of weld repairs shall be performed by the Contractor at no additional cost to the Government. Inspection and tests will be performed as required for visual inspection and NDE, except that destructive tests may be required also. When destructive tests are ordered by the Contracting Officer and performed by the Contractor and the specimens or other supplemental examinations indicate that the materials and workmanship do not conform to the contract requirements, the cost of the tests, corrections, and repairs shall be borne by the Contractor. When the specimens or other supplemental examinations of destructive tests indicate that materials or workmanship do conform to the specification requirements, the cost of the tests and repairs will be borne by the Government. When destructive tests are made, repairs shall be made by qualified welders or welding operators using welding procedures which will develop the full strength of the members cut. Welding shall be subject to inspection and tests in the mill, shop, and field. When materials or workmanship do not conform to the specification requirements, the work may be rejected at any time before final acceptance of the system containing the weldment.

3.3 ACCEPTANCE STANDARDS

3.3.1 Visual

The following indications are unacceptable:

a. Cracks.

b. Undercut on surface which is greater than 1/32 inchdeep.

c. Weld reinforcement greater than 3/16 inch.

d. Lack of fusion on surface.

e. Incomplete penetration (applies only when inside surface is readily accessible).

f. Convexity of fillet weld surface greater than 10 percent of longest leg plus 0.03 inch.

g. Concavity in groove welds.

h. Concavity in fillet welds greater than 1/16 inch.

i. Fillet weld size less than indicated or greater than 1-1/4 times the minimum indicated fillet leg length.

3.3.2 Radiography

Welds that are shown by radiography to have any of the following discontinuities are unacceptable:

a. Porosity in excess of that shown as acceptable in ASME BPV I, Appendix A-250.

b. Any type of crack or zone of incomplete fusion or penetration.

c. Any other elongated indication which has a length greater than:

1. 1/4 inch for t up to 3/4 inch inclusive, where t is the thickness of the thinner portion of the weld.

2. 1/3 t for t from 3/4 inch to 2-1/4 inch, inclusive.

3. 3/4 inch for t over 2-1/4 inch.

d. Any group of indications in line that have an aggregate length greater than t in a length of 12t, except where the distance between the successive indications exceeds 6L where L is the longest indication in the group.

Where t pertains to the thickness of the weld being examined; if a weld joins two members having different thickness at the weld, t is the thinner of these two thicknesses.

3.4 CORRECTIONS AND REPAIRS

Defects shall be removed and repaired as specified in ASME B31.1, unless otherwise specified. Disqualifying defects discovered between weld passes shall be repaired before additional weld material is deposited. Wherever a defect is removed, and repair by welding is not required, the affected area shall be blended into the surrounding surface eliminating sharp notches, crevices, or corners. After defect removal is complete and before rewelding, the area shall be examined by the same test method which first revealed the defect to ensure that the defect has been eliminated. After rewelding, the repaired area shall be reexamined by the same test method originally used for that area. Any indication of a defect shall be regarded as a defect unless reevaluation by NDE or by surface conditioning shows that no disqualifying defects are present. The use of any foreign material to mask, fill in, seal, or disguise welding defects will not be permitted.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 05 - METALS

SECTION 05500

MISCELLANEOUS METAL

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 GENERAL REQUIREMENTS
1.4 DISSIMILAR MATERIALS
1.5 WORKMANSHIP
1.6 ANCHORAGE
1.7 ALUMINUM FINISHES
1.8 SHOP PAINTING

PART 2 PRODUCTS

2.1 VENTS
2.2 PIPE GUARDS
2.3 FLOOR GRATINGS AND FRAMES
2.4 FLOOR PLATES
2.5 FOUNDATION VENTS
2.6 HANDRAILS
2.6.1 Steel Handrails, Including Carbon Steel Inserts
2.6.2 Aluminum Handrails
2.7 LADDERS
2.8 MISCELLANEOUS
2.9 PIPE SUPPORT RACKS
2.10 SAFETY NOSING
2.11 STEEL DOOR FRAMES
2.12 TRENCH COVERS, FRAMES, AND LINERS

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS
3.2 REMOVABLE ACCESS PANELS
3.3 INSTALLATION VENTS
3.4 INSTALLATION OF PIPE GUARDS
3.5 ATTACHMENT OF HANDRAILS
3.5.1 Installation of Steel Handrails
3.5.2 Installation of Aluminum Handrails
3.6 INSTALLATION OF SAFETY NOSINGS
3.7 DOOR FRAMES
3.8 TRENCH FRAMES AND COVERS

-- End of Section Table of Contents --

SECTION 05500

MISCELLANEOUS METAL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ALUMINUM ASSOCIATION (AA)

AA DAF-45	(1997) Designation System for Aluminum Finishes

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A14.3	(1992) Ladders - Fixed - Safety Requirements

ASTM INTERNATIONAL (ASTM)

ASTM A 36/A 36M	(2000a) Carbon Structural Steel
ASTM A 53/A 53M	(1999b) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A 123/A 123M	(2001a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 283/A 283M	(2000) Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A 500	(1999) Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A 653/A 653M	(2000) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 924/A 924M	(1999) General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
ASTM B 26/B 26M	(1999) Aluminum-Alloy Sand Castings
ASTM B 429	(2000) Aluminum-Alloy Extruded Structural Pipe and Tube
ASTM D 2047	(1999) Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7	(1998) Minimum Design Loads for Buildings and Other Structures

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1	(2000) Structural Welding Code - Steel

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

CID A-A-344	(Rev B) Lacquer, Clear Gloss, Exterior, Interior

NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)

NAAMM MBG 531	(1994) Metal Bar Grating Manual
NAAMM MBG 532	(1994) Heavy Duty Metal Bar Grating Manual

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 211	(2000) Chimneys, Fireplaces, Vents and Solid Fuel-Burning Appliances

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-04 Samples

Miscellaneous Metal Items;

Detail drawings indicating material thickness, type. grade, and class; dimensions; and construction details. Drawings shall include catalog cuts, erection details, manufacturer's descriptive data and installation instructions, and templates.

1.3 GENERAL REQUIREMENTS

The Contractor shall verify all measurements and shall take all field measurements necessary before fabrication. Welding to or on structural steel shall be in accordance with AWS D1.1. Items specified to be galvanized, when practicable and not indicated otherwise, shall be hot-dip galvanized after fabrication. Galvanizing shall be in accordance with ASTM A 123/A 123M, ASTM A 653/A 653M, or ASTM A 924/A 924M, as applicable. Exposed fastenings shall be compatible materials, shall generally match in color and finish, and shall harmonize with the material to which fastenings are applied. Materials and parts necessary to complete each item, even though such work is not definitely shown or specified, shall be included. Poor matching of holes for fasteners shall be cause for rejection. Fastenings shall be concealed where practicable. Thickness of metal and details of assembly and supports shall provide strength and stiffness. Joints exposed to the weather

shall be formed to exclude water.

1.4 DISSIMILAR MATERIALS

Where dissimilar metals are in contact, or where aluminum is in contact with concrete, mortar, masonry, wet or pressure-treated wood, or absorptive materials subject to wetting, the surfaces shall be protected with a coat of bituminous paint or asphalt varnish.

1.5 WORKMANSHIP

Miscellaneous metalwork shall be well formed to shape and size, with sharp lines and angles and true curves. Drilling and punching shall produce clean true lines and surfaces. Welding shall be continuous along the entire area of contact except where tack welding is permitted. Exposed connections of work in place shall not be tack welded. Exposed welds shall be ground smooth. Exposed surfaces of work in place shall have a smooth finish, and unless otherwise approved, exposed riveting shall be flush. Where tight fits are required, joints shall be milled. Corner joints shall be coped or mitered, well formed, and in true alignment. Work shall be accurately set to established lines and elevations and securely fastened in place. Installation shall be in accordance with manufacturer's installation instructions and approved drawings, cuts, and details.

1.6 ANCHORAGE

Anchorage shall be provided where necessary for fastening miscellaneous metal items securely in place. Anchorage not otherwise specified or indicated shall include slotted inserts made to engage with the anchors, expansion shields, and power-driven fasteners when approved for concrete; toggle bolts and through bolts for masonry; machine and carriage bolts for steel; and lag bolts and screws for wood.

1.7 ALUMINUM FINISHES

Unless otherwise specified, aluminum items shall have standard mill finish. or anodized finish. The thickness of the coating shall be not less than that specified for protective and decorative type finishes for items used in interior locations or architectural Class I type finish for items used in exterior locations in AA DAF-45. Items to be anodized shall receive a polished satin finish. Aluminum surfaces to be in contact with plaster or concrete during construction shall be protected with a field coat conforming to CID A-A-344.

1.8 SHOP PAINTING

Surfaces of ferrous metal except galvanized surfaces, shall be cleaned and shop coated with the manufacturer's standard protective coating unless otherwise specified. Surfaces of items to be embedded in concrete shall not be painted. Items to be finish painted shall be prepared according to manufacturer's recommendations or as specified.

PART 2 PRODUCTS

2.1 VENTS

Vents shall be designed and constructed in accordance with NFPA 211. Stacks shall be designed and constructed to withstand a wind velocity of

90 mph in accordance with ASCE 7. Unlined stacks shall be constructed of black-steel plates not less than 3/16 inchthick conforming to ASTM A 36/A 36M. Seams and joints shall be welded, except that an angle flange shall be provided for connection to the boiler, other equipment, and stack support.

2.2 PIPE GUARDS

Pipe guards shall be heavy duty steel pipe conforming to ASTM A 53/A 53M, Type E or S, weight STD, black finish.

2.3 FLOOR GRATINGS AND FRAMES

Aluminum or steel grating shall be designed in accordance with NAAMM MBG 531 or NAAMM MBG 532 to meet the indicated load requirements. Edges shall be banded with bars 1/4 inch less in height than bearing bars for grating sizes above 3/4 inch. Banding bars shall be flush with the top of bearing grating. Frames shall be of welded steel construction finished to match the grating. Steel floor gratings and frames shall be galvanized after fabrication..

2.4 FLOOR PLATES

Floor plates shall be 1/4 inch thick, galvanized, slip-resistant, carbon steel conforming to ASTM A 283/A 283M having a minimum static coefficient of friction of 0.50 when tested in accordance with ASTM D 2047.

2.5 FOUNDATION VENTS

Foundation vents shall be the same size as the masonry units or sized as indicated, and shall be of extruded aluminum with integral water stop and sliding interior closer or damper operable from the outside. Insect screen shall be provided at the back of the vent. Louvered opening shall have top and bottom drip lips, and the net ventilating area with closer or damper open shall be at least 35 percent of the gross wall opening. The frames shall have a structural strength adequate to permit use in masonry walls without a lintel.

2.6 HANDRAILS

Handrails shall be designed to resist a concentrated load of 200 pounds in any direction at any point of the top of the rail or 20 pounds per foot applied horizontally to top of the rail, whichever is more severe.

2.6.1 Steel Handrails, Including Carbon Steel Inserts

Steel handrails, including inserts in concrete, shall be steel pipe conforming to ASTM A 53/A 53M or structural tubing conforming to ASTM A 500, Grade A or B of equivalent strength. Steel railings shall be 1-1/2 inch nominal size. Railings shall be hot-dip galvanized and shop painted. Pipe collars shall be hot-dip galvanized steel.

a. Joint posts, rail, and corners shall be fabricated by one of the following methods:

   1. Flush type rail fittings of commercial standard, welded and ground smooth with railing splice locks secured with 3/8 inch hexagonal recessed-head setscrews.

2. Mitered and welded joints by fitting post to top rail and intermediate rail to post, mitering corners, groove welding joints, and grinding smooth. Railing splices shall be butted and reinforced by a tight fitting interior sleeve not less than 6 inches long.

3. Railings may be bent at corners in lieu of jointing, provided bends are made in suitable jigs and the pipe is not crushed.

b. Removable sections, toe-boards, and brackets shall be provided as indicated.

2.6.2 Aluminum Handrails

Handrails shall consist of 1-1/2 inch nominal Schedule 40 pipe ASTM B 429. Railings and pipe collars shall be anodized aluminum color. All fasteners shall be Series 300 stainless steel.

a. Jointing shall be by one of the following methods:

1. Flush type rail fittings, welded and ground smooth with splice locks secured with 3/8 inch recessed head setscrews.

2. Mitered and welded joints, made by fitting post to top rail and intermediate rail to post and corners, shall be groove welded and ground smooth. Splices, where allowed by the Contracting Officer, shall be butted and reinforced by a tight fitting dowel or sleeve not less than 6 inches in length. Dowel or sleeve shall be connected to one side of the splice by tack welding or by using epoxy cement.

3. Railings shall be assembled using slip-on aluminum-magnesium alloy fittings for joints. Fittings shall be fastened to pipe or tube with 1/4 inch or 3/8 inch stainless steel recessed head setscrews. Assembled railings shall be provided with fittings only at vertical supports or at rail terminations attached to walls. Expansion joints shall be at the midpoint of panels. A setscrew shall be provided in only one side of the slip-on sleeve. Alloy fittings shall conform to ASTM B 26/B 26M.

b. Removable sections, toe-boards and brackets shall be provided where indicated, using flange castings as appropriate.

2.7 LADDERS

Ladders shall be galvanized steel or aluminum, fixed rail type in accordance with ANSI A14.3.

2.8 MISCELLANEOUS

Miscellaneous plates and shapes for items that do not form a part of the structural steel framework, such as lintels, sill angles, miscellaneous mountings, and frames, shall be provided to complete the work.

2.9 PIPE SUPPORT RACKS

Pipe racks in utilidors shall use a metal framing system, using nut and

bolt connection of fittings and hardwared into 1-5/8 inch wide continuous slotted channels (Unistrut or equal). In new concrete construction, the wall supports shall be embedded in concrete. Pipe racks shall be hot-dip galvanized after fabrication to provide a Coating Grade of 65 (average zinc coating of 1.5 ounces/square foot) in accordance with ASTM A 123/A 123 M.

2.10 SAFETY NOSING

Safety nosings shall be of cast iron with cross-hatched, abrasive surface. Nosing shall be 3 inches wide and terminating at not more than 6 inches from the ends of treads, except nosing for metal pan cement-filled treads shall extend the full length of the tread. Safety nosings shall be provided with anchors not less than 3/4 inch long. Integrally cast mushroom anchors are not acceptable.

2.11 STEEL DOOR FRAMES

Steel door frames built from structural shapes shall be neatly mitered and securely welded at the corners with all welds ground smooth. Jambs shall be provided with 2 by 1/4 by 12 inch bent, adjustable metal anchors spaced not over 2 feet 6 inches on centers. Provision shall be made to stiffen the top member for all spans over 3 feet. Continuous door stops shall be made of 1-1/2 by 5/8 inch bars.

2.12 TRENCH COVERS, FRAMES, AND LINERS

Trench covers shall be designed to meet the indicated load requirements. Trench frames and anchors shall be all welded steel construction designed to match cover. Covers shall be secured to frame. Grating opening widths shall not exceed 1 inch. Trench liners shall be cast iron with integral frame for cover.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

All items shall be installed at the locations shown and according to the manufacturer's recommendations. Items listed below require additional procedures as specified.

3.2 REMOVABLE ACCESS PANELS

A removable access panel not less than 12 by 12 inches shall be installed directly below each valve, flow indicator, damper, or air splitter that is located above the ceiling, other than an acoustical ceiling, and that would otherwise not be accessible.

3.3 INSTALLATION VENTS

Vents shall be installed in accordance with NFPA 211. Sections of prefabricated lined stacks shall be joined with acid-resisting high-temperature cement and steel draw bands.

3.4 INSTALLATION OF PIPE GUARDS

Pipe guards shall be set vertically in concrete piers. Piers shall be constructed of, and the hollow cores of the pipe filled with, concrete specified in SECTION 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

3.5 ATTACHMENT OF HANDRAILS

Toeboards and brackets shall be installed where indicated. Splices, where required, shall be made at expansion joints. Removable sections shall be installed as indicated.

3.5.1 Installation of Steel Handrails

Installation shall be by means of pipe sleeves secured to concrete or masonry with expansion shields and bolts or toggle bolts or base plates bolted to stringers or structural steel framework. Rail ends shall be secured by steel pipe flanges anchored by expansion shields and bolts.

3.5.2 Installation of Aluminum Handrails

Installation shall be by means of flanges anchored to concrete or masonry by expansion shields or base plates or flanges bolted to stringers or structural steel framework. Bolts used to anchor aluminum alloy flanges shall be stainless steel of a size appropriate to the standard product of the manufacturer. Where aluminum or alloy fittings or extrusions are to be in contact with dissimilar metals or portland cement concrete, the contact surface shall be given a heavy coating of bituminous paint or asphalt varnish.

3.6 INSTALLATION OF SAFETY NOSINGS

Nosing shall be completely embedded in concrete before the initial set of the concrete occurs and shall finish flush with the top of the concrete surface.

3.7 DOOR FRAMES

Door frames shall be secured to the floor slab by means of angle clips and expansion bolts. Continuous door stops shall be welded to the frame or tap screwed with countersunk screws at no more than 18 inchcenters, assuring in either case full contact with the frame. Any necessary reinforcements shall be made and the frames shall be drilled and tapped as required for hardware.

3.8 TRENCH FRAMES AND COVERS

Trench frames and covers shall finish flush with the floor.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 09 - FINISHES

SECTION 09900

PAINTS AND COATINGS

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 PACKAGING, LABELING, AND STORAGE
1.4 SAFETY AND HEALTH
1.5 WORKER EXPOSURE
1.6 ENVIRONMENTAL CONDITIONS
1.6.1 Coatings

PART 2 PRODUCTS

2.1 MATERIALS
2.2 LEAD
2.3 CHROMIUM

PART 3 EXECUTION

3.1 PROTECTION OF AREAS AND SPACES NOT TO BE PAINTED
3.2 SURFACE PREPARATION
3.2.1 Additional Requirements for Preparation of Surfaces With Existing Coatings:
3.2.2 Existing Coated Surfaces with Minor Defects
3.3 PREPARATION OF METAL SURFACES
3.3.1 Existing and New Ferrous Surfaces
3.3.2 Galvanized Surfaces
3.3.3 Non-Ferrous Metallic Surfaces
3.4 APPLICATION
3.4.1 Coating Application
3.4.2 Mixing and Thinning of Paints
3.4.3 Two-Component Systems
3.4.4 Coating Systems
3.5 COATING SYSTEMS FOR METAL

-- End of Section Table of Contents --

SECTION 09900

PAINTS AND COATINGS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH Limit Values	(2001) Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices

ASTM INTERNATIONAL (ASTM)

ASTM D 235	Standard Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)
ASTM D 2092	(1995) Preparation of Zinc-Coated (Galvanized) Steel Surfaces for Painting

SCIENTIFIC CERTIFICATION SYSTEMS (SCS)

SCS SP01-01	(2001) Environmentally Preferable Product Specification for Architectural and Anti-Corrosive Paints

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC SP 1	(1982) Solvent Cleaning
SSPC SP 2	(1995) Hand Tool Cleaning
SSPC SP 3	(1995) Power Tool Cleaning
SSPC SP 6	(1994) Commercial Blast Cleaning
SSPC SP 7	(1994) Brush-Off Blast Cleaning
SSPC SP 10	(1994) Near-White Blast Cleaning

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2003) Safety and Health Requirements Manual

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When

used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

Samples of specified materials may be taken and tested for compliance with specification requirements.

In keeping with the intent of Executive Order 13101, "Greening the Government through Waste Prevention, Recycling, and Federal Acquisition", products certified by SCS as meeting SCS SP01-01 shall be given preferential consideration over registered products. Products that are registered shall be given preferential consideration over products not carrying any EPP designation.

SD-03 Product Data

Coating;

Manufacturer's Technical Data Sheets;

SD-04 Samples

Color;

Submit manufacturer's samples of paint colors.

SD-08 Manufacturer's Instructions

Application instructions;

Mixing;

Detailed mixing instructions, minimum and maximum application temperature and humidity, potlife, and curing and drying times between coats.

1.3 PACKAGING, LABELING, AND STORAGE

Paints shall be in sealed containers that legibly show the contract specification number, designation name, formula or specification number, batch number, color, quantity, date of manufacture, manufacturer's formulation number, manufacturer's directions including any warnings and special precautions, and name and address of manufacturer. Pigmented paints shall be furnished in containers not larger than 5 gallons. Paints and thinners shall be stored in accordance with the manufacturer's written directions, and as a minimum, stored off the ground, under cover, with sufficient ventilation to prevent the buildup of flammable vapors, and at temperatures between 40 to 95 degrees F.

1.4 SAFETY AND HEALTH

Apply coating materials using safety methods and equipment in accordance with the following:

Work shall comply with applicable Federal, State, and local laws and regulations, and with the ACCIDENT PREVENTION PLAN, including the Activity Hazard Analysis as specified in Appendix A of COE EM 385-1-1. The Activity Hazard Analysis shall include analyses of the potential impact of painting operations on painting personnel and on others

involved in and adjacent to the work zone.

1.5 WORKER EXPOSURE

Exposure of workers to hazardous chemical substances shall not exceed limits established by ACGIH Limit Values or as required by a more stringent applicable regulation.

1.6 ENVIRONMENTAL CONDITIONS

1.6.1 Coatings

Do not apply coating when air or substrate conditions are:

a. Less than 5 degrees F above dew point;

b. Below 50 degrees F or over 95 degrees F, unless specifically pre-approved by the Contracting Officer and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.

PART 2 PRODUCTS

2.1 MATERIALS

Conform to the coating specifications and standards referenced in PART 3. Submit manufacturer's technical data sheets for specified coating and solvents.

2.2 LEAD

Paints containing lead in excess of .06 percent by weight of the total nonvolatile content (calculated as lead metal) shall not be used.

2.3 CHROMIUM

Paints containing zinc chromium or strontium chromate pigments shall not be used.

PART 3 EXECUTION

3.1 PROTECTION OF AREAS AND SPACES NOT TO BE PAINTED

Prior to surface preparation and coating applications, remove, mask, or otherwise protect, hardware, hardware accessories, machined surfaces, radiator covers, plates, lighting fixtures, public and private property, and other such items not to be coated that are in contact with surfaces to be coated. Following completion of painting, workmen skilled in the trades involved shall reinstall removed items. Restore surfaces contaminated by coating materials, to original condition and repair damaged items.

3.2 SURFACE PREPARATION

Remove dirt, splinters, loose particles, grease, oil, and other foreign matter and substances deleterious to coating performance as specified for each substrate before application of paint or surface treatments. Oil and grease shall be removed prior to mechanical cleaning. Cleaning shall be programmed so that dust and other contaminants will not fall on

wet, newly painted surfaces. Exposed ferrous metals such as nail heads on or in contact with surfaces to be painted with water-thinned paints, shall be spot-primmed with a suitable corrosion-inhibitive primer capable of preventing flash rusting and compatible with the coating specified for the adjacent areas.

3.2.1 Additional Requirements for Preparation of Surfaces With Existing Coatings:

Before application of coatings, perform the following on surfaces covered by soundly-adhered coatings, defined as those which cannot be removed with a putty knife:

a. Wipe previously painted surfaces to receive solvent-based coatings, except stucco and similarly rough surfaces clean with a clean, dry cloth saturated with mineral spirits, ASTM D 235. Allow surface to dry. Wiping shall immediately precede the application of the first coat of any coating, unless specified otherwise.

b. Sand existing glossy surfaces to be painted to reduce gloss. Brush, and wipe clean with a damp cloth to remove dust.

c. The requirements specified are minimum. Comply also with the application instructions of the paint manufacturer.

d. Previously painted surfaces shall be thoroughly cleaned of all grease, dirt, dust or other foreign matter.

e. Blistering, cracking, flaking and peeling or other deteriorated coatings shall be removed.

f. Slick surfaces shall be roughened. Damaged areas such as, but not limited to, nail holes, cracks, chips, and spalls shall be repaired with suitable material to match adjacent undamaged areas.

g. Edges of chipped paint shall be feather edged and sanded smooth.

h. Rusty metal surfaces shall be cleaned as per SSPC requirements. Solvent, mechanical, or chemical cleaning methods shall be used to provide surfaces suitable for painting.

i. New, proposed coatings shall be compatible with existing coatings.

3.2.2 Existing Coated Surfaces with Minor Defects

Sand and treat minor defects to render them smooth. Minor defects are defined as scratches, nicks, cracks, gouges, spalls, alligatoring, chalking, and irregularities due to partial peeling of previous coatings.

3.3 PREPARATION OF METAL SURFACES

3.3.1 Existing and New Ferrous Surfaces

a. Ferrous Surfaces including Shop-coated Surfaces and Small Areas That Contain Rust, Mill Scale and Other Foreign Substances:

Solvent clean or detergent wash in accordance with SSPC SP 1 to remove oil and grease. Where shop coat is missing or damaged, clean according to SSPC SP 2, or SSPC SP 3. Brush-off blast remaining surface in accordance with SSPC SP 7 may be used to remove loose coating and other loose materials. Shop-coated ferrous surfaces shall be protected from corrosion by treating and touching up corroded areas immediately upon detection.

3.3.2 Galvanized Surfaces

a. New or Existing Galvanized Surfaces With Only Dirt and Zinc Oxidation Products: Clean with solvent, steam, or non-alkaline detergent solution in accordance with SSPC SP 1. If the galvanized metal has been passivated or stabilized, the coating shall be completely removed by brush-off abrasive blast. New galvanized steel to be coated shall not be "passivated" or "stabilized" If the absence of hexavalent stain inhibitors is not documented, test as described in ASTM D 2092, Appendix X2, and remove by one of the methods described therein.

b. Galvanized with Slight Coating Deterioration or with Little or No Rusting: Water jetting to SSPC SP 6 WJ3 to remove loose coating from surfaces with less than 20 percent coating deterioration and no blistering, peeling, or cracking. Use inhibitor as recommended by the coating manufacturer to prevent rusting.

c. Galvanized With Severe Deteriorated Coating or Severe Rusting: Spot abrasive blast rusted areas as described for steel in SSPC SP 6 WJ3 to remove existing coating.

3.3.3 Non-Ferrous Metallic Surfaces

Aluminum and aluminum-alloy, lead, copper, and other nonferrous metal surfaces.

Surface Cleaning: Solvent clean in accordance with SSPC SP 1 and wash with mild non-alkaline detergent to remove dirt and water soluble contaminants.

3.4 APPLICATION

3.4.1 Coating Application

Painting practices shall comply with applicable federal, state and local laws enacted to insure compliance with Federal Clean Air Standards.

At the time of application, paint shall show no signs of deterioration. Uniform suspension of pigments shall be maintained during application.

Unless otherwise specified or recommended by the paint manufacturer, paint may be applied by brush, roller, or spray. Rollers for applying paints and enamels shall be of a type designed for the coating to be applied and the surface to be coated.

Paints, except water-thinned types, shall be applied only to surfaces that are completely free of moisture as determined by sight or touch.

Thoroughly work coating materials into joints, crevices, and open

spaces. Special attention shall be given to insure that all edges, corners, crevices, welds, and rivets receive a film thickness equal to that of adjacent painted surfaces.

Each coat of paint shall be applied so dry film shall be of uniform thickness and free from runs, drops, ridges, waves, pinholes or other voids, laps, brush marks, and variations in color, texture, and finish. Hiding shall be complete.

Touch up damaged coatings before applying subsequent coats.

a. Drying Time: Allow time between coats, as recommended by the coating manufacturer, to permit thorough drying, but not to present topcoat adhesion problems. Provide each coat in specified condition to receive next coat.

b. Primers, and Intermediate Coats: Do not allow primers or intermediate coats to dry more than 30 days, or longer than recommended by manufacturer, before applying subsequent coats. Follow manufacturer's recommendations for surface preparation if primers or intermediate coats are allowed to dry longer than recommended by manufacturers of subsequent coatings. Each coat shall cover surface of preceding coat or surface completely, and there shall be a visually perceptible difference in shades of successive coats.

c. Finished Surfaces: Provide finished surfaces free from runs, drops, ridges, waves, laps, brush marks, and variations in colors.

3.4.2 Mixing and Thinning of Paints

Reduce paints to proper consistency by adding fresh paint, except when thinning is mandatory to suit surface, temperature, weather conditions, application methods, or for the type of paint being used. Obtain written permission from the Contracting Officer to use thinners. The written permission shall include quantities and types of thinners to use.

When thinning is allowed, paints shall be thinned immediately prior to application. The use of thinner shall not relieve the Contractor from obtaining complete hiding, full film thickness, or required gloss. Thinning shall not cause the paint to exceed limits on volatile organic compounds. Paints of different manufacturers shall not be mixed.

3.4.3 Two-Component Systems

Two-component systems shall be mixed in accordance with manufacturer's instructions. Any thinning of the first coat to ensure proper penetration and sealing shall be as recommended by the manufacturer for each type of substrate.

3.4.4 Coating Systems

a. Systems by Substrates: Apply coatings that conform to the respective specifications listed.

b. Minimum Dry Film Thickness (DFT): Apply paints, primers, varnishes, enamels, undercoats, and other coatings to a minimum dry film thickness of 1.5 mil each coat unless specified

otherwise in the Tables. Coating thickness where specified, refers to the minimum dry film thickness.

c. Coatings for Surfaces Not Specified Otherwise: Coat surfaces which have not been specified, the same as surfaces having similar conditions of exposure.

d. Existing Surfaces Damaged During Performance of the Work, Including New Patches In Existing Surfaces: Coat surfaces with the following:

1. One coat of primer.

2. One coat of undercoat or intermediate coat.

3. One topcoat to match adjacent surfaces.

e. Existing Coated Surfaces To Be Painted: Apply coatings conforming to the respective specifications listed in the Tables herein, except that pretreatments, sealers and fillers need not be provided on surfaces where existing coatings are soundly adhered and in good condition. Do not omit undercoats or primers.

3.5 COATING SYSTEMS FOR METAL

EXTERIOR METAL, FERROUS PAINT

a. New Steel that has been hand or power tool cleaned to SSPC SP 2 or SSPC SP 3:

b. New Steel that has been blast-cleaned to SSPC SP 6:

c. Existing steel that has been spot-blasted to SSPC SP 6:

d. New and existing steel blast cleaned to SSPC SP 10:

e. Metal floors (non-shop-primed surfaces or non-slip deck surfaces) with non-skid additive (NSA), load at manufacturer's recommendations.:

EXTERIOR GALVANIZED SURFACES

a. New Galvanized surfaces:

b. Galvanized surfaces with slight coating deterioration; little or no rusting:

c. Galvanized surfaces with severely deteriorated coating or rusting:

EXTERIOR SURFACES, OTHER METALS (NON-FERROUS)

Aluminum, aluminum alloy and other miscellaneous non-ferrous metal items not otherwise specified except hot metal surfaces, roof surfaces, and new prefinished equipment. Match surrounding finish:

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 13 - SPECIAL CONSTRUCTION

SECTION 13110

CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE)

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 GENERAL REQUIREMENTS
1.3.1 Services of "Corrosion Expert"
1.3.2 Contractor's Modifications
1.3.3 Isolators
1.3.4 Anode and Bond Wires
1.3.5 Surge Protection
1.3.6 Summary of Services Required
1.3.7 Nonmetallic Pipe System
1.3.7.1 Coatings
1.3.7.2 Tracer Wire
1.3.8 Tests of Components
1.3.9 Drawings
1.3.10 Electrical Potential Measurements
1.3.11 Achievement of Criteria for Protection
1.3.12 Metallic Components and Typicals
1.3.13 Metallic Component Coating

PART 2 PRODUCTS

2.1 MAGNESIUM ANODES
2.1.1 Anode Composition
2.1.2 Dimensions and Weights
2.1.3 Packaged Anodes
2.1.4 Zinc Anodes
2.1.5 Connecting Wire
2.1.5.1 Wire Requirements
2.1.5.2 Anode Header Cable
2.2 MISCELLANEOUS MATERIALS
2.2.1 Electrical Wire
2.2.1.1 Wire Splicing
2.2.1.2 Test Wires
2.2.1.3 Resistance Wire
2.2.2 Conduit
2.2.3 Test Boxes and Junctions Boxes
2.2.4 Joint, Patch, Seal, and Repair Coating
2.2.5 Backfill Shields
2.2.6 Epoxy Potting Compound
2.2.7 Test Stations
2.2.8 Joint and Continuity Bonds
2.2.9 Resistance Bonds
2.2.10 Stray Current Measurements
2.2.11 Electrical Isolation of Structures
2.2.11.1 Electrically Isolating Pipe Joints
2.2.11.2 Electrically Conductive Couplings

2.2.11.3 Insulating Joint Testing
2.2.12 Underground Structure Coating
2.2.12.1 Field Joints
2.2.12.2 Inspection of Pipe Coatings
2.2.13 Resistance Wire
2.2.14 Electrical Connections
2.2.15 Electrical Tape
2.2.16 Permanent Reference Electrodes
2.2.17 Casing

PART 3 EXECUTION

3.1 CRITERIA OF PROTECTION
3.1.1 Iron and Steel
3.2 ANODE STORAGE AND INSTALLATION
3.2.1 Anode Storage
3.2.2 Anode Installation
3.2.2.1 Single Anodes
3.2.2.2 Groups of Anodes
3.2.2.3 Welding Methods
3.2.3 Anode Placement - General
3.2.4 Underground Pipeline
3.2.5 Installation Details
3.2.6 Lead Wire Connections
3.2.6.1 Underground Pipeline (Metallic)
3.2.6.2 Resistance Wire Splices
3.2.7 Location of Test Stations
3.2.8 Underground Pipe Joint Bonds
3.3 ELECTRICAL ISOLATION OF STRUCTURES
3.3.1 Isolation Joints and Fittings
3.4 TRENCHING AND BACKFILLING
3.5 TESTS AND MEASUREMENTS
3.5.1 Baseline Potentials
3.5.2 Isolation Testing
3.5.2.1 Insulation Checker
3.5.2.2 Cathodic Protection Meter
3.5.3 Anode Output
3.5.4 Reference Electrode Potential Measurements
3.5.5 Location of Measurements
3.5.5.1 Piping or Conduit
3.5.5.2 Tanks
3.5.5.3 Casing Tests
3.5.5.4 Interference Testing
3.5.5.5 Holiday Test
3.5.5.6 Recording Measurements
3.6 TRAINING COURSE
3.7 CLEANUP
3.8 MISCELLANEOUS INSTALLATION AND TESTING
3.8.1 Coatings
3.8.2 Excavation
3.9 SPARE PARTS
3.10 SYSTEM TESTING

-- End of Section Table of Contents --

SECTION 13110

CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE)

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM B 418	(1995a) Cast and Wrought Galvanic Zinc Anodes
ASTM B 843	(1993; R 1998) Magnesium Alloy Anodes for Cathodic Protection
ASTM D 1248	(1998) Polyethylene Plastics Molding and Extrusion Materials

NACE INTERNATIONAL (NACE)

NACE RP0169	(1996) Control of External Corrosion on Underground or Submerged Metallic Piping Systems
NACE RP0177	(1995) Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems
NACE RP0188	(1999) Discontinuity (Holiday) Testing of Protective Coatings
NACE RP0190	(1995) External Protective Coatings for Joints, Fittings, and Valves on Metallic Underground or Submerged Pipelines and Piping Systems

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA TC 2	(1998) Electrical Polyvinyl Chloride (PVC) Tubing (EPT) and Conduit (EPC-40 and EPC-80)
NEMA WC 5	(1992; Rev 2 1996) Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2002) National Electrical Code

UNDERWRITERS LABORATORIES (UL)

UL 6	(1997) Rigid Metal Conduit
UL 510	(1994; Rev thru Apr 1998) Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape
UL 514A	(1996; Rev Dec 1999) Metallic Outlet Boxes

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Drawings; G.

Six copies of detail drawings consisting of a complete list of equipment and material including manufacturer's descriptive and technical literature, catalog cuts, results of system design calculations including soil-resistivity, installation instructions and certified test data stating the maximum recommended anode current output density and the rate of gaseous production if any at that current density. Detail drawings shall contain complete wiring and schematic diagrams and any other details required to demonstrate that the system has been coordinated and will function properly as a unit.

Contractor's Modifications; G.

Six copies of detail drawings showing proposed changes in location, scope of performance indicating any variations from, additions to, or clarifications of contract drawings. The drawings shall show proposed changes in anode arrangement, anode size and number, anode materials and layout details, conduit size, wire size, mounting details, wiring diagram, method for electrically-isolating each pipe, and any other pertinent information to proper installation and performance of the system.

SD-03 Product Data

Cathodic Protection Equipment; G.

Within 30 days after receipt of notice to proceed, an itemized list of equipment and materials including item number, quantity, and manufacturer of each item. The list shall be accompanied by a description of procedures for each type of testing and adjustments, including testing of coating for thickness and holidays. Installation of materials and equipment shall not commence until this submittal is approved.

Spare Parts;

Spare parts data for each different item of material and

equipment specified, after approval of detail drawings and not later than six (6) months prior to the date of beneficial occupancy. The data shall include a complete list of parts, special tools, and supplies, with current unit prices and source of supply. One (1) spare anode of each type shall be furnished.

SD-06 Test Reports

Tests and Measurements; G.

Test reports in booklet form tabulating all field tests and measurements performed, upon completion and testing of the installed system and including close interval potential survey, casing and interference tests, final system test verifying protection, insulated joint and bond tests, and holiday coating test. A certified test report showing that the connecting method has passed a 120-day laboratory test without failure at the place of connection, wherein the anode is subjected to maximum recommended current output while immersed in a three percent sodium chloride solution.

Contractor's Modifications; G.

Final report regarding Contractor's modifications. The report shall include pipe-to-soil measurements throughout the affected area, indicating that the modifications improved the overall conditions, and current measurements for anodes. The following special materials and information are required: taping materials and conductors; zinc grounding cell, installation and testing procedures, and equipment; coating material; system design calculations for anode number, life, and parameters to achieve protective potential; backfill shield material and installation details showing waterproofing; bonding and waterproofing details; insulated resistance wire; exothermic weld equipment and material.

SD-07 Certificates

Cathodic Protection System;

Proof that the materials and equipment furnished under this section conform to the specified requirements contained in the referenced standards or publications. The label or listing by the specified agency will be acceptable evidence of such compliance.

Services of "Corrosion Expert"; G.

Evidence of qualifications of the "corrosion expert."

a. The "corrosion expert's" name and qualifications shall be certified in writing to the Contracting Officer prior to the start of construction.

b. Certification shall be submitted giving the name of the firm, the number of years of experience, and a list of not less than five (5) of the firm's installations three (3) or more years old that have been tested and found satisfactory.

SD-10 Operation and Maintenance Data

Cathodic Protection System;

Before final acceptance of the cathodic protection system, six copies of operating manuals outlining the step-by-step procedures required for system startup, operation, adjustment of current flow, and shutdown. The manuals shall include the manufacturer's name, model number, service manual, parts list, and brief description of all equipment and their basic operating features. Six copies of maintenance manual, listing routine maintenance procedures, recommendation for maintenance testing, possible breakdowns and repairs, and troubleshooting guides. The manuals shall include single-line diagrams for the system as installed; instructions in making pipe-to-reference cell and tank-to-reference cell potential measurements and frequency of monitoring; instructions for dielectric connections, interference and sacrificial anode bonds; instructions shall include precautions to ensure safe conditions during repair of pipe or other metallic systems. The instructions shall be neatly bound between permanent covers and titled "Operating and Maintenance Instructions." These instructions shall be submitted for the Contracting Officer's approval. The instructions shall include the following:

a. As-built drawings, to scale of the entire system, showing the locations of the piping, location of all anodes and test stations, locations of all insulating joints, and structure-to-reference cell potentials as measured during the tests required by Paragraph: TESTS AND MEASUREMENTS, of this section.

b. Recommendations for maintenance testing, including instructions in making pipe-to-reference cell potential measurements and frequency of testing.

c. All maintenance and operating instructions and nameplate data shall be in English.

d. Instructions shall include precautions to insure safe conditions during repair of pipe system.

Training Course;

The proposed Training Course Curriculum (including topics and dates of discussion) indicating that all of the items contained in the operating and maintenance instructions, as well as demonstrations of routine maintenance operations, including testing procedures included in the maintenance instructions, are to be covered.

1.3 GENERAL REQUIREMENTS

The Contractor shall furnish and install a complete, operating, sacrificial anode cathodic protection system in complete compliance with NFPA 70, with all applicable Federal, State, and local regulations and with minimum requirements of this contract. The services required include planning, installation, adjusting and testing of a cathodic protection system, using sacrificial anodes for cathodic protection of the steam and condensate lines. The cathodic protection system shall

include anodes, cables, connectors, corrosion protection test stations, and any other equipment required for a complete operating system providing the NACE criteria of protection as specified. Insulators are required whenever needed to insulate the pipes from any other structure. Any pipe crossing the steam and condensate pipes shall have a test station. The cathodic protection shall be provided on the steam and condensate pipes.

1.3.1 Services of "Corrosion Expert"

The Contractor shall obtain the services of a "corrosion expert" to supervise, inspect, and test the installation and performance of the cathodic protection system. "Corrosion expert" refers to a person, who by thorough knowledge of the physical sciences and the principles of engineering and mathematics, acquired by professional education and related practical experience, is qualified to engage in the practice of corrosion control of buried or submerged metallic surfaces. Such a person must be accredited or certified by the National Association of Corrosion Engineers (NACE) as a NACE Accredited Corrosion Specialist or a NACE certified Cathodic Protection (CP) Specialist or be a registered professional engineer who has certification or licensing that includes education and experience in corrosion control of buried or submerged metallic piping and tank systems, if such certification or licensing includes 5 years experience in corrosion control on underground metallic surfaces of the type under this contract. The "corrosion expert" shall make at least 3 visits to the project site. The first of these visits shall include obtaining soil resistivity data, acknowledging the type of pipeline coatings to be used and reporting to the Contractor the type of cathodic protection required. Once the submittals are approved and the materials delivered, the "corrosion expert" shall revisit the site the ensure the Contractor understands installation practices and laying out the components. The third visit shall involve testing the installed cathodic protection systems and training applicable personnel on proper maintenance techniques. The "corrosion expert" shall supervise installation and testing of all cathodic protection.

1.3.2 Contractor's Modifications

The specified system is based on a complete system with magnesium sacrificial anodes. The Contractor may modify the cathodic protection system after review of the project, site verification, and analysis, if the proposed modifications include the anodes specified and will provide better overall system performance. The modifications shall be fully described, shall be approved by the Contracting Officer's representative, and shall meet the following criteria. The proposed system shall achieve a minimum pipe-to-soil "instant off" potential of minus 850 millivolts with reference to a saturated copper-copper sulfate reference cell on the underground components of the piping or other metallic surface. The Contractor shall take resistivity measurements of the soil in the vicinity of the pipes and ground bed sites. Based upon the measurements taken, the current and voltage shall be required to produce a minimum of minus 850 millivolts "instant off" potential between the structure being tested and the reference cell. This potential shall be obtained over 95 percent of the metallic area. The anode system shall be designed for a life of twenty-five (25) years of continuous operation.

1.3.3 Isolators

Isolators are required to insulate the indicated pipes from any other structure. Isolators shall be provided with lightning protection and a test station as shown.

1.3.4 Anode and Bond Wires

A minimum of 5 magnesium anodes with an unpackaged weight of 9 pounds shall be provided uniform distances along the metallic pipe lines. These anodes shall be in addition to anodes for the pipe under concrete slab and casing requirements. For each cathodic system, the metallic components and structures to be protected shall be made electrically continuous. This shall be accomplished by installing bond wires between the various structures. Bonding of existing buried structures may also be required to preclude detrimental stray current effects and safety hazards. Provisions shall be included to return stray current to its source without damaging structures intercepting the stray current. The electrical isolation of underground facilities in accordance with acceptable industry practice shall be included under this section. All tests shall be witnessed by the Contracting Officer.

1.3.5 Surge Protection

Approved zinc grounding cells or sealed weatherproof lightning arrestor devices shall be installed across insulated flanges or fittings installed in underground piping as indicated on the drawings. The arrestor shall be gapless, self-healing, solid state type. Zinc anode composition shall conform to ASTM B 418, Type II. Lead wires shall be number 6 AWG copper with high molecular weight polyethylene (HMWPE) insulation. The zinc grounding cells shall not be prepackaged in backfill but shall be installed as detailed on the drawings. Lightning arrestors or zinc grounding cells are not required for insulated flanges on metallic components used on nonmetallic piping systems.

1.3.6 Summary of Services Required

The scope of services shall include, but shall not be limited to, the following:

a. Close-interval potential surveys.

b. Cathodic Protection Systems.

c. System testing.

d. Casing corrosion control.

e. Interference testing.

f. Training.

g. Operating and maintenance manual.

h. Insulator testing and bonding testing.

i. Coating and holiday testing shall be submitted within 45 days of notice to proceed.

1.3.7 Nonmetallic Pipe System

In the event pipe other than metallic pipe is approved and used in lieu of metallic pipe, all metallic components of this pipe system shall be protected with cathodic protection. Detailed drawings of cathodic protection for each component shall be submitted to the Contracting Officer for approval within 45 days after date of receipt of notice to proceed, and before commencement of any work.

1.3.7.1 Coatings

Coatings for metallic components shall be as required for metallic fittings. Protective covering (coating and taping) shall be completed and tested on each metallic component (such as valves, hydrants and fillings). This covering shall be as required for underground metallic pipe. Each test shall be witnessed by the Contracting Officer. Coatings shall be selected, applied, and inspected in accordance with NACE RP0190 and as specified in these specifications. The use of nonmetallic pipe does not change other requirements of the specifications. Any deviations due to the use of nonmetallic pipe shall be submitted for approval.

1.3.7.2 Tracer Wire

When a nonmetallic pipe line is used to extend or add to an existing metallic line, an insulated No. 8 AWG copper wire shall be thermit-welded to the existing metallic line and run the length of the new nonmetallic line. This wire shall be used as a locator tracer wire and to maintain continuity to any future extensions of the pipe line.

1.3.8 Tests of Components

A minimum of four (4) tests shall be made at each metallic component in the piping system. Two (2) measurements shall be made directly over the anodes and the other two (2) tests shall be over the outer edge of the component, but at the farthest point from the anodes. Structure and pipes shall be shown with the cathodic protection equipment. All components of the cathodic protection system shall be shown on drawings, showing their relationship to the protected structure or component. A narrative shall describe how the cathodic protection system will work and provide testing at each component. Components requiring cathodic protection shall include but not be limited to the following:

a. Pipes under the floor slab or foundations.

b. Any metallic pipe component or section.

1.3.9 Drawings

Detailed drawings shall be provided showing location of anodes, insulated fittings, test stations, permanent reference cells, and bonding. Locations shall be referenced to two (2) permanent facilities or mark points.

1.3.10 Electrical Potential Measurements

All potential tests shall be made at a minimum of 10 foot intervals witnessed by the Contracting Officer. Submittals shall identify test locations on separate drawing, showing all metal to be protected and all cathodic protection equipment. Test points equipment and protected metal shall be easily distinguished and identified.

1.3.11 Achievement of Criteria for Protection

All conductors, unless otherwise shown, shall be routed to or through the test stations. Each system provided shall achieve a minimum pipe-to-soil "instant off" potential of minus 850 millivolt potentials with reference to a saturated copper-copper-sulfate reference cell on all underground components of the piping. Based upon the measurements taken, the current and voltage of the anodes should be adjusted as required to produce a minimum of minus 850 millivolts "instant off" potential between the structure being tested and the reference cell. This potential should be obtained over 95 percent of the metallic area. This must be achieved without the "instant off" potential exceeding 1150 millivolts. Testing will be witnessed by the Contracting Officer. Additional anodes shall be provided by the Contractor if required to achieve the minus 850 millivolts "instant off". Although acceptance criteria of the cathodic protection systems are defined in NACE RP0169, for this project the "instant off" potential of minus 850 millivolts is the only acceptable criteria.

1.3.12 Metallic Components and Typicals

a. Metallic components: As a minimum, each metallic component shall be protected with two (2) magnesium anodes. This number of anodes is required to achieve minus 850 millivolts "instant off" potential on the metallic area and at the same time not provide overvoltage above 1150 millivolts "instant off." As a minimum, the magnesium anode unpackaged weight shall be 9 pounds. The magnesium anodes shall be located on each side of the metallic component and routed through a test station.

b. Pipe Under Concrete Slab: Pipe under concrete slab shall have a minimum of 2 magnesium anodes. These magnesium anodes shall have an unpackaged weight of 9 pounds. Pipe under concrete slab shall have 1 permanent reference electrodes located under the slab. One (1) permanent reference electrode shall be located where the pipe enters the concrete slab. All conductors shall be routed to a test station.

c. Metallic Pipe Component or Section: Each section of metallic pipe shall be protected with 2 magnesium anodes. The magnesium anodes shall have an unpackaged weight of 9 pounds.

1.3.13 Metallic Component Coating

Coatings for metallic components shall be as required for metallic fittings as indicated. This will include fire hydrants, T's, elbows, valves, etc. Coatings shall be selected, applied, and inspected in accordance with NACE RP0190 and as specified in these specifications.

PART 2 PRODUCTS

2.1 MAGNESIUM ANODES

A minimum of 3 anodes shall be installed on the Pipe system. See Paragraph METALLIC COMPONENTS AND TYPICALS for additional anodes under slab.

2.1.1 Anode Composition

Anodes shall be of high-potential magnesium alloy, made of primary magnesium obtained from sea water or brine, and not made from scrap metal. Magnesium anodes shall conform to ASTM B 843 and to the following analysis (in percents) otherwise indicated:

Aluminum, max.	0.010
Manganese, max.	0.50 to 1.30
Zinc	0.05
Silicon, max.	0.05
Copper, max.	0.02
Nickel, max.	0.001
Iron, Max.	0.03
Other impurities, max.	0.05 each or 0.3 max. total
Magnesium	Remainder

The Contractor shall furnish spectrographic analysis on samples from each heat or batch of anodes used on this project.

2.1.2 Dimensions and Weights

Dimensions and weights of anodes shall be approximately as follows:

TYPICAL MAGNESIUM ANODE SIZE

(Cross sections may be round, square, or D shaped)

NOMINAL WT. LBS.	APPROX. SIZE (IN)	NOMINAL GROSS WT lb PACKAGED IN BACKFILL	NOMINAL PACKAGE DIMENSIONS (IN)
3	3 X 3 X 5	8	5-1/4 X 5-1/4 X 8
5	3 X 3 X 8	13	5-1/4 X 5-1/4 X 11-1/4
9	3 X 3 X 14	27	5-1/4 X 20
12	4 X 4 X 12	32	7-1/2 X 18
17	4 X 4 X 17	45	7-1/2 X 24
32	5 X 5 X 20-1/2	68	8-1/2 X 28
50	7 X 7 X 16	100	10 X 24

2.1.3 Packaged Anodes

Anodes shall be provided in packaged form with the anode surrounded by specially-prepared quick-wetting backfill and contained in a water permeable cloth or paper sack. Anodes shall be centered by means of spacers in the backfill material. The backfill material shall have the following composition, unless otherwise indicated:

Material	Approximate Percent by Weight
Gypsum	75
Bentonite	20
Sodium Sulphate	5
Total	100

2.1.4 Zinc Anodes

Zinc anodes shall conform to ASTM B 418, Type II.

2.1.5 Connecting Wire

2.1.5.1 Wire Requirements

Wire shall be No. 10 AWG solid copper wire, not less than 10 feet long, unspliced, complying with NFPA 70, Type TW insulation. Connecting wires for magnesium anodes shall be factory installed with the place or emergence from the anode in a cavity sealed flush with a dielectric sealing compound.

2.1.5.2 Anode Header Cable

Cable for anode header and distribution shall be No. 10 AWG stranded copper wire with type CP high molecular weight polyethylene, 7/64 inch thick insulation, 600-volt rating, in accordance with NEMA WC 5.

2.2 MISCELLANEOUS MATERIALS

2.2.1 Electrical Wire

Wire shall be No. 10 AWG stranded copper wire with NFPA 70, Type TW insulation. Polyethylene insulation shall comply with the requirements of ASTM D 1248 and shall be of the following types, classes, and grades:

High-molecular weight polyethylene shall be Type I, Class C, Grade E5.

High-density polyethylene shall be Type III, Class C, Grade E3.

2.2.1.1 Wire Splicing

Connecting wire splicing shall be made with copper compression connectors or exothermic welds, following instructions of the manufacturer. Single split-bolt connections shall not be used. Sheaths for encapsulating electrical wire splices to be buried underground shall fit the insulated wires entering the spliced joints and epoxy potting compound shall be as specified below.

2.2.1.2 Test Wires

Test wires shall be AWG No. 12 stranded copper wire with NFPA 70, Type TW or RHW or polyethylene insulation.

2.2.1.3 Resistance Wire

Resistance wire shall be AWG No. 16 or No. 22 nickel-chromium wire.

2.2.2 Conduit

Rigid galvanized steel conduit and accessories shall conform to UL 6. Non metallic conduit shall conform to NEMA TC 2.

2.2.3 Test Boxes and Junctions Boxes

Boxes shall be outdoor type conforming to UL 514A.

2.2.4 Joint, Patch, Seal, and Repair Coating

Sealing and dielectric compound shall be a black, rubber based compound that is soft, permanently pliable, tacky, moldable, and unbacked. Compound shall be applied as recommended by the manufacturer, but not less than 1/2-inch thick. Coating compound shall be cold-applied coal-tar base mastic . Pressure-sensitive vinyl plastic electrical tape shall conform to UL 510.

2.2.5 Backfill Shields

Shields shall consist of approved pipeline wrapping or fiberglass-reinforced, coal-tar impregnated tape, or plastic weld caps, specifically made for the purpose and installed in accordance with the manufacturer's recommendations. When joint bonds are required, due to the use of mechanical joints, the entire joint shall be protected by the use of a kraft paper joint cover. The joint cover shall be filled with poured-in, hot coat-tar enamel.

2.2.6 Epoxy Potting Compound

Compound for encapsulating electrical wire splices to be buried underground shall be a two package system made for the purpose.

2.2.7 Test Stations

Stations shall be of the aboveground and shall be the standard product of a recognized manufacturer. Test stations shall be complete with an insulated terminal block having the required number of terminals. The test station shall be provided with a lockable over and shall have an embossed legend, "C.P. Test." A minimum of one (1) test station shall be provided each component of the pipe . A minimum of six (6) terminals shall be provided in each test station. A minimum of two (2) leads are required to the metallic pipe from each test station. Other conductors shall be provided for each anode, other foreign pipe, and reference cells as required. .

2.2.8 Joint and Continuity Bonds

Bonds shall be provided across all joints in the metallic steam and condensate lines, across any electrically discontinuous connections and all other pipes and structures with other than welded or threaded joints that are included in this cathodic protection system. Unless otherwise specified in the specifications, bonds between structures and across joints in pipe with other than welded or threaded joints shall be No. 8 AWG stranded copper cable with polyethylene insulation. Bonds between structures shall contain sufficient slack for any anticipated movement between structures. Bonds across pipe joints shall contain a minimum of 4 inches of slack to allow for pipe movement and soil stress. Bonds shall be attached by exothermic welding. Exothermic weld areas shall be insulated with coating compound and approved, and witnessed by the Contracting Officer. Continuity bonds shall be installed as necessary to reduce stray current interference. Additional joint bondings shall be accomplished by the Contractor where the necessity is discovered during construction or testing or where the Contracting Officer's representative directs that such bonding be done. Joint bonding shall include all associated excavation and backfilling. There shall be a minimum of two (2) continuity bonds between each structure and other than welded or threaded joints. The Contractor shall test for electrical continuity across all joints with other than welded or threaded joints and across all metallic portions or components. The

Contractor shall provide bonding as required and as specified above until electrical continuity is achieved. Bonding test data shall be submitted for approval.

2.2.9 Resistance Bonds

Resistance bonds should be adjusted as outlined in this specification. Alternate methods may be used if they are approved by the Contracting Officer.

2.2.10 Stray Current Measurements

Stray current measurements should be performed at each test station. Stray currents resulting from lightning or overhead alternating current (AC) power transmission systems shall be mitigated in accordance with NACE RP0177.

2.2.11 Electrical Isolation of Structures

As a minimum, isolating flanges or unions shall be provided at the following locations:

a. Connection of new metallic piping or components to existing piping.

b. Pressure piping under floor slab to a building.

Isolation shall be provided at metallic connection of all lines to existing system and where connecting to a building. Isolation fittings, including isolating flanges and couplings, shall be installed aboveground or in a concrete pit.

2.2.11.1 Electrically Isolating Pipe Joints

Electrically isolating pipe joints shall be of a type that is in regular factory production.

2.2.11.2 Electrically Conductive Couplings

Electrically conductive couplings shall be of a type that has a published maximum electrical resistance rating given in the manufacturer's literature. Cradles and seals shall be of a type that is in regular factory production made for the purpose of electrically insulating the carrier pipe from the casing and preventing the incursion of water into the annular space.

2.2.11.3 Insulating Joint Testing

A Model 601 Insulation Checker, as manufactured by "Gas Electronics", or an approved equal, shall be used for insulating joint (flange) electrical testing.

2.2.12 Underground Structure Coating

This coating specification shall take precedence over any other project specification and drawing notes, whether stated or implied, and shall also apply to the pipeline or tank supplier. No variance in coating quality shall be allowed by the Contractor or Base Construction Representative without the written consent of the designer. All

underground metallic pipelines and tanks to be cathodically protected shall be afforded a good quality factory-applied coating. This includes all carbon steel, cast-iron and ductile-iron pipelines or vessels. Coatings shall be selected, applied, and inspected in accordance with NACE RP0190 and as specified. If non-metallic pipelines are installed, all metallic fittings on pipe sections shall be coated in accordance with this specification section.

a. The nominal thickness of the metallic pipe joint or other component coating shall be a minimum of 16 mils, plus or minus 5 percent.

b. Pipe and joint coating for factory applied or field repair material shall be applied as recommended by the manufacturer and shall be one of the following:

1. Continuously extruded polyethylene and adhesive coating system.

2. Polyvinyl chloride pressure-sensitive adhesive tape.

3. High density polyethylene/bituminous rubber compound tape.

4. Butyl rubber tape.

5. Coal tar epoxy.

2.2.12.1 Field Joints

All field joints shall be coated with materials compatible with the pipeline coating compound. The joint coating material shall be applied to an equal thickness as the pipeline coating. Unbonded coatings shall not be used on these buried metallic components. This includes the elimination of all unbonded polymer wraps or tubes. Once the pipeline or vessel is set in the trench, an inspection of the coating shall be conducted. This inspection shall include electrical holiday detection. Any damaged areas of the coating shall be properly repaired. The Contracting Officer shall be asked to witness inspection of the coating and testing using a holiday detector.

2.2.12.2 Inspection of Pipe Coatings

Any damage to the protective covering during transit and handling shall be repaired before installation. After field coating and wrapping has been applied, the entire pipe shall be inspected by an electric holiday detector with impressed current in accordance with NACE RP0188 using a full-ring, spring-type coil electrode. The holiday detector shall be equipped with a bell, buzzer, or other type of audible signal which sounds when a holiday is detected. All holidays in the protective covering shall be repaired immediately upon detection. Occasional checks of holiday detector potential will be made by the Contracting Officer's representative to determine suitability of the detector. All labor, materials, and equipment necessary for conducting the inspection shall be furnished by the Contractor.

a. Protective covering for aboveground piping system: Finish painting shall conform to the applicable paragraph of SECTION: 09900, PAINTS AND COATINGS, and as follows:

b. Ferrous surfaces: Shop-primed surfaces shall be touched-up with ferrous metal primer. Surfaces that have not been shop-primed shall be solvent-cleaned. Surfaces that contain loose rust, loose mil scale, and other foreign substances shall be mechanically-cleaned by power wire-brushing and primed with ferrous metal primer. Primed surface shall be finished with two (2) coats of exterior oil paint and vinyl paint. Coating for each entire piping service shall be an approved pipe line wrapping having a minimum coating resistance of 50,000 Ohms per square foot.

2.2.13 Resistance Wire

Wire shall be No. 16 or No. 22 nickel-chromium wire with TW insulation.

2.2.14 Electrical Connections

Electrical connections shall be done as follows:

a. Exothermic welds shall be "Cadweld"," Bundy", "Thermoweld" or an approved equal. Use of this material shall be in strict accordance with the manufacturer's recommendations.

b. Electrical-shielded arc welds shall be approved for use on steel pipe by shop drawing submittal action.

c. Brazing shall be as specified in Paragraph: Lead Wire Connections.

2.2.15 Electrical Tape

Pressure-sensitive vinyl plastic electrical tape shall conform to UL 510.

2.2.16 Permanent Reference Electrodes

Permanent reference electrodes shall be Cu-CuS04 electrodes suitable for direct burial. Electrodes shall be guaranteed by the supplier for 15 years' service in the environment in which they shall be placed. Electrodes shall be installed directly beneath pipe, or metallic component.

2.2.17 Casing

Where a pipeline is installed in a casing under a roadway or railway, the pipeline shall be electrically insulated from the casing, and the annular space sealed and filled with an approved corrosion inhibiting product against incursion of water.

PART 3 EXECUTION

3.1 CRITERIA OF PROTECTION

Acceptance criteria for determining the adequacy of protection on a buried underground pipe shall be in accordance with NACE RP0169 and as specified below.

3.1.1 Iron and Steel

The following method (a) shall be used for testing cathodic protection voltages. If more than one method is required, method (b) shall be used.

a. A negative voltage of at least minus 850 millivolts as measured between the underground component and a saturated copper-copper sulphate reference electrode connecting the earth (electrolyte) directly over the underground component. Determination of this voltage shall be made with the cathodic protection system in operation. Voltage drops shall be considered for valid interpretation of this voltage measurement. A minimum of minus 850 millivolts "instant off" potential between the underground component being tested and the reference cell shall be achieved over 95 percent of the area of the structure. Adequate number of measurements shall be obtained over the entire structure, pipe, tank, or other metallic component to verify and record achievement of minus 850 millivolts "instant off." This potential shall be obtained over 95 percent of the total metallic area without the "instant off" potential exceeding 1200 millivolts.

b. A minimum polarization voltage shift of 100 millivolts as measured between the underground component and a saturated copper-copper sulphate reference electrode contacting the earth directly over the underground component. This polarization voltage shift shall be determined by interrupting the protective current and measuring the polarization decay. When the protective current is interrupted, an immediate voltage shift will occur. The voltage reading, after the immediate shift, shall be used as the base reading from which to measure polarization decay. Measurements achieving 100 millivolts decay shall be made over 95 percent of the metallic surface being protected.

c. For any metallic component, a minimum of four (4) measurements shall be made using subparagraph (a), above, and achieving the "instant off" potential of minus 850 millivolts. Two (2) measurements shall be made over the anodes and two (2) measurements shall be made at different locations near the component and farthest away from the anode.

3.2 ANODE STORAGE AND INSTALLATION

3.2.1 Anode Storage

Storage area for magnesium anodes will be designated by the Contracting Officer. If anodes are not stored in a building, tarps or similar protection should be used to protect anodes from inclement weather. Packaged anodes, damaged as a result of improper handling or being exposed to rain, shall be resacked by the Contractor and the required backfill added.

3.2.2 Anode Installation

Unless otherwise authorized, installation shall not proceed without the presence of the Contracting Officer. Anodes of the size specified shall be installed to the depth indicated and at the locations shown. Locations may be changed to clear obstructions with the approval of the Contracting Officer. Anodes shall be installed in sufficient number and of the required type, size, and spacing to obtain a uniform current distribution over the surface of the structure. The anode system shall e designed for a life of 25 years of continuous operation. Anodes shall be installed as indicated in a dry condition after any plastic or waterproof protective covering has been completely removed from the

water permeable, permanent container housing the anode metal. The anode connecting wire shall not be used for lowering the anode into the hole. The annular space around the anode shall be backfilled with fine earth in 6 inch layers and each layer shall be hand tamped. Care must be exercised not to strike the anode or connecting wire with the tamper. Approximately 5 gallonsof water shall be applied to each filled hole after anode backfilling and tamping has been completed to a point about 6 inches above the anode. After the water has been absorbed by the earth, backfilling shall be completed to the ground surface level.

3.2.2.1 Single Anodes

Single anodes, spaced as shown, shall be connected to the pipeline, allowing adequate slack in the connecting wire to compensate for movement during backfill operation.

3.2.2.2 Groups of Anodes

Groups of anodes, in quantity and location shown, shall be connected to an anode header cable. The anode header cable shall make contact with the structure to be protected only through a test station. Anode lead connection to the anode header cable shall be made by an approved crimp connector or exothermic weld and splice mold kit with appropriate potting compound.

3.2.2.3 Welding Methods

Connections to ferrous pipe shall be made by exothermic weld methods manufactured for the type of pipe supplied. Electric arc welded connections and other types of welded connections to ferrous pipe and structures shall be approved before use.

3.2.3 Anode Placement - General

Packaged anodes shall be installed completely dry, and shall be lowered into holes by rope sling or by grasping the cloth gather. The anode lead wire shall not be used in lowering the anodes. The hole shall be backfilled with fine soil in 6inch layers and each layer shall be hand-tamped around the anode. Care must be exercised not to strike the anode or lead wire with the tamper. If immediate testing is to be performed, water shall be added only after backfilling and tamping has been completed to a point 6 inches above the anode. Approximately 2 gallons of water may be poured into the hole. After the water has been absorbed by the soil, backfilling and tamping may be completed to the top of the hole. Anodes shall be installed as specified or shown. In the event a rock strata is encountered prior to achieving specified augered-hole depth, anodes may be installed horizontally to a depth at least as deep as the bottom of the pipe, with the approval of the Contracting Officer.

3.2.4 Underground Pipeline

Anodes shall be installed at a minimum of 8 feet and a maximum of 10 feet from the line to be protected.

3.2.5 Installation Details

Details shall conform to the requirements of this specification. Details shown on the drawings are indicative of the general type of

material required, and are not intended to restrict selection to material of any particular manufacturer.

3.2.6 Lead Wire Connections

3.2.6.1 Underground Pipeline (Metallic)

To facilitate periodic electrical measurements during the life of the sacrificial anode system and to reduce the output current of the anodes, if required, all anode lead wires shall be connected to a test station and buried a minimum of 24 inches in depth. The cable shall be No. 10 AWG, stranded copper, polyethylene or RHW-USE insulated cable. The cable shall make contact with the structure only through a test station. Resistance wire shall be installed between the cable and the pipe cable, in the test station, to reduce the current output, if required. Anode connections, except in the test station, shall be made with exothermic welding process, and shall be insulated by means of at least three (3) layers of electrical tape; and all lead wire connections shall be installed in a moistureproof splice mold kit and filled with epoxy resin. Lead wire-to-structure connections shall be accomplished by an exothermic welding process. All welds shall be in accordance with the manufacturer's recommendations. A backfill shield filled with a pipeline mastic sealant or material compatible with the coating shall be placed over the weld connection and shall be of such diameter as to cover the exposed metal adequately.

3.2.6.2 Resistance Wire Splices

Resistance wire connections shall be accomplished with silver solder and the solder joints wrapped with a minimum of three (3) layers of pressure-sensitive tape. Lead wire connections shall be installed in a moistureproof splice mold kit and filled with epoxy resin.

3.2.7 Location of Test Stations

Test stations shall be of the type and location shown and shall be indoor mounted. Buried insulating joints shall be provided with test wire connections brought to a test station. Unless otherwise shown, other test stations shall be located as follows:

a. At 1,000-foot intervals or less.

b. Where the pipe or conduit crosses any other metal pipe.

c. At both ends of casings under roadways and railways.

d. Where both sides of an insulating joint are not accessible above ground for testing purposes.

3.2.8 Underground Pipe Joint Bonds

Underground pipe having other than welded or threaded coupling joints shall be made electrically continuous by means of a bonding connection installed across the joint.

3.3 ELECTRICAL ISOLATION OF STRUCTURES

3.3.1 Isolation Joints and Fittings

Isolating fittings, including main line isolating flanges and couplings, shall be installed aboveground, or within manholes, wherever possible. Where isolating joints must be covered with soil, they shall be fitted with a paper joint cover specifically manufactured for covering the particular joint, and the space within the cover filled with hot coal-tar enamel. Isolating fittings in lines entering buildings shall be located at least 12 inches above grade of floor level, when possible. Isolating joints shall be provided with grounding cells to protect against over-voltage surges or approved surge protection devices. The cells shall provide a low resistance across isolating joint without excessive loss of cathodic current.

3.4 TRENCHING AND BACKFILLING

Trenching and backfilling shall be in accordance with SECTION 02300 EARTHWORK.

3.5 TESTS AND MEASUREMENTS

3.5.1 Baseline Potentials

Each test and measurement will be witnessed by the Contracting Officer. The Contractor shall notify the Contracting Officer a minimum of five (5) working days prior to each test. After backfill of the pipe , the static potential-to-soil of the pipe shall be measured. The locations of these measurements shall be identical to the locations specified for pipe-to-reference electrode potential measurements. The initial measurements shall be recorded.

3.5.2 Isolation Testing

Before the anode system is connected to the pipe, an isolation test shall be made at each isolating joint or fitting. This test shall demonstrate that no metallic contact, or short circuit exists between the two isolated sections of the pipe. Any isolating fittings installed and found to be defective shall be reported to the Contracting Officer.

3.5.2.1 Insulation Checker

A Model 601 insulation checker, as manufactured by "Gas Electronics", or an approved equal, using the continuity check circuit, shall be used for isolating joint (flange) electrical testing. Testing shall conform to the manufacturer's operating instructions. Test shall be witnessed by the Contracting Officer. An isolating joint that is good will read full scale on the meter. If an isolating joint is shorted, the meter pointer will be deflected or near zero on the meter scale. Location of the fault shall be determined from the instructions, and the joint shall be repaired. If an isolating joint is located inside a vault, the pipe shall be sleeved with insulator when entering and leaving the vault.

3.5.2.2 Cathodic Protection Meter

A Model B3A2 cathodic protection meter, as manufactured by "M.C. Miller", or an approved equal, using the continuity check circuit, shall be used for isolating joint (flange) electrical testing. This test shall be performed in addition to the Model 601 insulation checker. Continuity is checked across the isolation joint after the test lead wire is shorted together and the meter adjusted to scale. A full-scale deflection indicates the system is shorted at some location. The Model

601 verifies that the particular insulation under test is good and the Model B3A2 verifies that the system is isolated. If the system is shorted, further testing shall be performed to isolate the location of the short.

3.5.3 Anode Output

As the anodes or groups of anodes are connected to the pipe , current output shall be measured with an approved clamp-on milliammeter, calibrated shunt with a suitable millivoltmeter or multimeter, or a low resistance ammeter. (Of the three methods, the low-resistance ammeter is the least desirable and most inaccurate. The clamp-on milliammeter is the most accurate.) The valves obtained and the date, time, and location shall be recorded.

3.5.4 Reference Electrode Potential Measurements

Upon completion of the installation and with the entire cathodic protection system in operation, electrode potential measurements shall be made using a copper-copper sulphate reference electrode and a potentiometer-voltmeter, or a direct-current voltmeter having an internal resistance (sensitivity) of not less than 10 megohms per volt and a full scale of 10 volts. The locations of these measurements shall be identical to the locations used for baseline potentials. The values obtained and the date, time, and locations of measurements shall be recorded. No less than eight (8) measurements shall be made over any length of line or component. Additional measurements shall be made at each distribution service riser, with the reference electrode placed directly over the service line.

3.5.5 Location of Measurements

3.5.5.1 Piping or Conduit

For coated piping or conduit, measurements shall be taken from the reference electrode located in contact with the earth, directly over the pipe. Connection to the pipe shall be made at service risers, valves, test leads, or by other means suitable for test purposes. Pipe-to-soil potential measurements shall be made at intervals not exceeding 10 feet. The Contractor may use a continuous pipe-to-soil potential profile in lieu of 5 foot interval pipe-to-soil potential measurements. Additional measurements shall be made at each distribution service riser, with the reference electrode placed directly over the service line adjacent to the riser. Potentials shall be plotted versus distance to an approved scale. Locations where potentials do not meet or exceed the criteria shall be identified and reported to the Contracting Officer's representative.

3.5.5.2 Tanks

For underground tanks, measurements shall be taken from the reference electrode located:

a. Directly over the center of the tank.

b. At a point directly over the tank and midway between each pair of anodes.

At least six measurements shall be made.

3.5.5.3 Casing Tests

Before final acceptance of the installation, the electrical separation of carrier pipe from casings shall be tested and any short circuits corrected.

3.5.5.4 Interference Testing

Before final acceptance of the installation, interference tests shall be made with respect to any foreign pipes in cooperation with the owner of the foreign pipes. A full report of the tests giving all details shall be made. Stray current measurements shall be performed at all isolating locations and at locations where the new pipeline crosses foreign metallic pipes. The method of measurements and locations of measurements shall be submitted for approval. As a minimum, stray current measurements shall be performed at the following locations:

a. Connection point of new pipeline to existing pipeline.

b. Crossing points of new pipeline with existing lines.

Results of stray current measurements shall also be submitted for approval.

3.5.5.5 Holiday Test

Any damage to the protective covering during transit and handling shall be repaired before installation. After field-coating and wrapping has been applied, the entire pipe shall be inspected by an electric holiday detector with impressed current in accordance with NACE RP0188 using a full-ring, spring-type coil electrode. The holiday detector shall be equipped with a bell, buzzer, or other type of audible signal which sounds when a holiday is detected. Holidays in the protective covering shall be repaired upon detection. Occasional checks of holiday detector potential will be made by the Contracting Officer to determine suitability of the detector. Labor, materials, and equipment necessary for conducting the inspection shall be furnished by the Contractor. The coating system shall be inspected for holes, voids, cracks, and other damage during installation.

3.5.5.6 Recording Measurements

All pipe-to-soil potential measurements, including initial potentials where required, shall be recorded. The Contractor shall locate, correct and report to the Contracting Officer any short circuits to foreign pipes encountered during checkout of the installed cathodic protection system. Pipe-to-soil potential measurements shall be taken on as many pipes as necessary to determine the extent of protection or to locate short-circuits.

3.6 TRAINING COURSE

The Contractor shall conduct a training course for the operating staff as designated by the Contracting Officer. The training period shall consist of a total of 4 hours of normal working time and shall start after the system is functionally completed but prior to final acceptance tests. The field instructions shall cover all of the items contained in the operating and maintenance instructions, as well as demonstrations of

routine maintenance operations, including testing procedures included in the maintenance instructions. At least 14 days prior to date of proposed conduction of the training course, the training course curriculum shall be submitted for approval, along with the proposed training date. Training shall consist of demonstration of test equipment, providing forms for test data and the tolerances which indicate that the system works.

3.7 CLEANUP

The Contractor shall be responsible for cleanup of the construction site. All paper bags, wire clippings, etc., shall be disposed of as directed. Paper bags, wire clippings and other waste shall not be put in bell holes or anodes excavation.

3.8 MISCELLANEOUS INSTALLATION AND TESTING

3.8.1 Coatings

All aboveground pipeline shall be coated as indicated or as approved. The coating shall have a minimum thickness of 7 mil. The pipeline coating shall be in accordance with all applicable Federal, State, and local regulations.

3.8.2 Excavation

In the event rock is encountered in providing the required depth for anodes, the Contractor shall determine an alternate approved location and, if the depth is still not provided, an alternate plan shall be submitted to the Contracting Officer. Alternate techniques and depths must be approved prior to implementation.

3.9 SPARE PARTS

After approval of shop drawings, and not later than three (3) months prior to the date of beneficial occupancy, the Contractor shall furnish spare parts data for each different item of material and equipment specified. The data shall include a complete list of parts, special tools, and supplies, with current unit prices and source of supply. In addition, the Contractor shall supply information for material and equipment replacement for all other components of the complete system, including anodes, cables, splice kits and connectors, corrosion test stations, and any other components not listed above. The Contractor shall furnish a reference cell on a reel with 350 feet of conductor, along with other accessories, and a digital voltmeter that can be used in the maintenance of this cathodic protection system. Use of this equipment shall be demonstrated in actual tests during the training course, which shall include a description of the the equipment and measurement of the pipe-to-soil potential, rainfall, and gas company voltages.

3.10 SYSTEM TESTING

The Contractor shall submit a report including potential measurements taken at adequately-close intervals to establish that minus 850 millivolts potential, "instant-off" potential, is provided, and that the cathodic protection is not providing interference to other foreign pipes causing damage to paint or pipes. The report shall provide a narrative describing how the criteria of protection is achieved without damaging

other pipe or structures in the area.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 13 - SPECIAL CONSTRUCTION

SECTION 13280

ASBESTOS ABATEMENT

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 DEFINITIONS
1.4 DESCRIPTION OF WORK
1.4.1 Abatement Work Tasks
1.4.2 Unexpected Discovery of Asbestos
1.5 QUALIFICATIONS
1.5.1 Written Qualifications and Organization Report
1.5.2 Specific Requirements
1.6 REGULATORY REQUIREMENTS
1.7 SAFETY AND HEALTH PROGRAM AND PLANS
1.7.1 Asbestos Hazard Abatement Plan Appendix
1.7.2 Activity Hazard Analyses Appendix
1.8 PRECONSTRUCTION CONFERENCE AND ONSITE SAFETY
1.9 SECURITY
1.10 MEDICAL REQUIREMENTS
1.10.1 Medical Examinations
1.10.1.1 Information Provided to the Physician
1.10.1.2 Written Medical Opinion
1.10.2 Medical and Exposure Records
1.11 TRAINING PROGRAM
1.11.1 General Training Requirements
1.11.2 Project Specific Training
1.12 RESPIRATORY PROTECTION PROGRAM
1.12.1 Respiratory Fit Testing
1.12.2 Respirator Selection and Use Requirements
1.12.3 Class I Work
1.12.4 Class II and III Work
1.12.5 Sanitation
1.13 HAZARD COMMUNICATION PROGRAM
1.14 LICENSES, PERMITS AND NOTIFICATIONS
1.14.1 General Legal Requirements
1.15 PERSONAL PROTECTIVE EQUIPMENT
1.15.1 Respirators
1.15.2 Whole Body Protection
1.15.2.1 Coveralls
1.15.2.2 Underwear
1.15.2.3 Work Clothing
1.15.2.4 Gloves
1.15.2.5 Foot Coverings
1.15.2.6 Head Covering
1.15.2.7 Protective Eye Wear
1.16 HYGIENE FACILITIES AND PRACTICES
1.16.1 Shower Facilities
1.16.2 3-Stage Decontamination Area
1.16.3 Load-Out Unit

1.16.4 Single Stage Decontamination Area
1.16.5 Decontamination Requirements for Class IV Work
1.16.6 Decontamination Area Entry Procedures
1.16.7 Decontamination Area Exit Procedures
1.16.8 Lunch Areas
1.16.9 Smoking
1.17 REGULATED AREAS
1.18 WARNING SIGNS AND TAPE
1.19 WARNING LABELS
1.20 MATERIALS AND EQUIPMENT
1.21 VACUUM, FILTRATION AND VENTILATION EQUIPMENT
1.22 LOCAL EXHAUST VENTILATION
1.23 TOOLS
1.24 RENTAL EQUIPMENT
1.25 AIR MONITORING EQUIPMENT
1.26 EXPENDABLE SUPPLIES
1.26.1 Glovebag
1.26.2 Duct Tape
1.26.3 Disposal Containers
1.26.4 Disposal Bags
1.26.5 Fiberboard Drums
1.26.6 Cardboard Boxes
1.26.7 Sheet Plastic
1.26.7.1 Flame Resistant
1.26.7.2 Reinforced
1.26.8 Amended Water
1.26.9 Mastic Removing Solvent
1.26.10 Leak-tight Wrapping
1.26.11 Viewing Inspection Window
1.26.12 Wetting Agents
1.26.13 Strippable Coating
1.27 MISCELLANEOUS ITEMS

PART 2 PRODUCTS

2.1 ENCAPSULANTS

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS
3.2 PROTECTION OF ADJACENT WORK OR AREAS TO REMAIN
3.3 BUILDING VENTILATION SYSTEM AND CRITICAL BARRIERS
3.4 METHODS OF COMPLIANCE
3.4.1 Mandated Practices
3.4.2 Control Methods
3.4.3 Unacceptable Practices
3.4.4 Class I Work Procedures
3.4.5 Specific Control Methods for Class I Work
3.4.5.1 Negative Pressure Enclosure (NPE) System
3.4.5.2 Glovebag Systems
3.4.5.3 Mini-Enclosures
3.4.5.4 Wrap and Cut Operation
3.4.6 Cleaning After Asbestos Removal
3.4.7 Sealing Contaminated Items Designated for Disposal
3.5 FINAL CLEANING AND VISUAL INSPECTION
3.6 LOCKDOWN
3.7 EXPOSURE ASSESSMENT AND AIR MONITORING
3.7.1 General Requirements For Exposure Monitoring
3.7.2 Initial Exposure Assessment

3.7.3 Preabatement Environmental Air Monitoring
3.7.4 Environmental Air Monitoring During Abatement
3.7.5 Air-Monitoring Results and Documentation
3.8 CLEARANCE CERTIFICATION
3.9 CLEANUP AND DISPOSAL
3.9.1 Title to ACM Materials
3.9.2 Collection and Disposal of Asbestos
3.9.3 Scale Weight Measurement
3.9.4 Weigh Bill and Delivery Tickets
3.9.5 Asbestos Waste Shipment Record

-- End of Section Table of Contents --

SECTION 13280

ASBESTOS ABATEMENT

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

STATE OF ALASKA ADMINISTRATIVE CODE (AAC)

8 AAC 61	(2003) Occupational Safety and Health Standards
18 AAC 60	(2003) Solid Waste Management

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z87.1	(1989; Errata; Z87.1a) Occupational and Educational Eye and Face Protection
ANSI Z88.2	(1992) Respiratory Protection
ANSI Z9.2	(1979; R 1991) Fundamentals Governing the Design and Operation of Local Exhaust Systems

ASTM INTERNATIONAL (ASTM)

ASTM C 732	(1995) Aging Effects of Artificial Weathering on Latex Sealants
ASTM D 1331	(1989; R 1995) Surface and Interfacial Tension of Solutions of Surface-Active Agents
ASTM D 2794	(1993; R 1999el) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D 4397	(1996) Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
ASTM D 522	(1993a) Mandrel Bend Test of Attached Organic Coatings
ASTM E 119	(2000) Fire Tests of Building Construction and Materials
ASTM E 1368	(2000) Visual Inspection of Asbestos Abatement Projects

ASTM E 736	(1992) Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
ASTM E 84	(2000a) Surface Burning Characteristics of Building Materials
ASTM E 96	(2000) Water Vapor Transmission of Materials

COMPRESSED GAS ASSOCIATION (CGA)

CGA G-7	(1990) Compressed Air for Human Respiration
CGA G-7.1	(1997) Commodity Specification for Air

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 701	(1999) Methods of Fire Tests for Flame-Resistant Textiles and Films

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH 84-100	(1984; Supple 1985, 1987, 1988 & 1990) NIOSH Manual of Analytical Methods

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2003) Safety and Health Requirements Manual

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 340/1-90/018	(1990) Asbestos/NESHAP Regulated Asbestos Containing Materials Guidance
EPA 340/1-90/019	(1990) Asbestos/NESHAP Adequately Wet Guidance

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 763	Asbestos
42 CFR 84	Approval of Respiratory Protective Devices
49 CFR 107	Hazardous Materials Program Procedures
49 CFR 171	General Information, Regulations, and Definitions

49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings

UNDERWRITERS LABORATORIES (UL)

UL 586	(1996; Rev thru Aug 1999) High-Efficiency, Particulate, Air Filter Units

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Respiratory Protection Program; G, ES-M

Records of the respirator program.
Asbestos Hazard Abatement Plan

Cleanup and Disposal

Waste shipment records. Weigh bills and delivery tickets, if used shall be furnished for information only.

Detailed Drawings; G, ES-M

Descriptions, detail project drawings, and site layout to include worksite containment area techniqueslocal exhaust ventilation system locations, decontamination units and load-out units, other temporary waste storage facility, location of temporary utilities (electrical, water, sewer) and boundaries of each regulated area.

Materials and Equipment

Qualifications; G, ES-M

A written report providing evidence of qualifications for personnel, facilities and equipment assigned to the work.

Training Program; G, ES-M

A copy of the written project site-specific training material as indicated in 29 CFR 1926, Section .1101 that will be used to train onsite employees. The training document shall be signed by the Contractor's Designated IH and Competent Person.

Medical Requirements; G, ES-M

Physician's written opinion.

SD-06 Test Reports

Exposure Assessment and Air Monitoring; G, ES-M

Initial exposure assessments, negative exposure assessments, air-monitoring results and documentation.

Local Exhaust Ventilation;

Pressure differential recordings.

Licenses, Permits and Notifications; G, ES-M

Licenses, permits, and notifications.

SD-07 Certificates

Vacuum, Filtrationand Ventilation Equipment;

1.3 DEFINITIONS

a. Adequately Wet: A term defined in 40 CFR 61, Subpart M, and EPA 340/1-90/019 meaning to sufficiently mix or penetrate with liquid to prevent the release of particulate. If visible emissions are observed coming from asbestos-containing material (ACM), then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wetted.

b. Aggressive Method: Removal or disturbance of building material by sanding, abrading, grinding, or other method that breaks, crumbles, or disintegrates intact asbestos-containing material (ACM).

c. Amended Water: Water containing a wetting agent or surfactant with a surface tension of at least 29 dynes per square centimeter when tested in accordance with ASTM D 1331.

d. Asbestos: Asbestos includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophylite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated and/or altered.

e. Asbestos-Containing Material (ACM): Any materials containing more than one percent asbestos.

f. Asbestos Fiber: A particulate form of asbestos, 5 micrometers or longer, with a length-to-width ratio of at least 3 to 1.

g. Authorized Person: Any person authorized by the Contractor and required by work duties to be present in the regulated areas.

h. Building Inspector: Individual who inspects buildings for asbestos and has EPA Model Accreditation Plan (MAP) "Building Inspector" training; accreditation required by 40 CFR 763, Subpart E, Appendix C.

i. Certified Industrial Hygienist (CIH): An Industrial Hygienist certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

j. Class I Asbestos Work: Activities defined by OSHA involving the removal of thermal system insulation (TSI) and surfacing ACM.

k. Class II Asbestos Work: Activities defined by OSHA involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos - containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic. Certain "incidental" roofing materials such as mastic, flashing and cements when they are still intact are excluded from Class II asbestos work. Removal of small amounts of these materials which would fit into a glovebag may be classified as a Class III job.

l. Class III Asbestos Work: Activities defined by OSHA that involve repair and maintenance operations, where ACM, including TSI and surfacing ACM, is likely to be disturbed. Operations may include drilling, abrading, cutting a hole, cable pulling, crawling through tunnels or attics and spaces above the ceiling, where asbestos is actively disturbed or asbestos-containing debris is actively disturbed.

m. Class IV Asbestos Work: Maintenance and custodial construction activities during which employees contact but do not disturb ACM and activities to clean-up dust, waste and debris resulting from Class I, II, and III activities. This may include dusting surfaces where ACM waste and debris and accompanying dust exists and cleaning up loose ACM debris from TSI or surfacing ACM following construction.

n. Clean room: An uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.

o. Competent Person: In addition to the definition in 29 CFR 1926, Section .32(f), a person who is capable of identifying existing asbestos hazards as defined in 29 CFR 1926, Section .1101, selecting the appropriate control strategy, has the authority to take prompt corrective measures to eliminate them and has EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training; accreditation required by 40 CFR 763, Subpart E, Appendix C.

p. Contractor/Supervisor: Individual who supervises asbestos abatement work and has EPA Model Accreditation Plan "Contractor/Supervisor" training; accreditation required by 40 CFR 763, Subpart E, Appendix C.

q. Critical Barrier: One or more layers of plastic sealed over all openings into a regulated area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a regulated area from migrating to an adjacent area.

r. Decontamination Area: An enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the

decontamination of workers, materials, and equipment that are contaminated with asbestos.

s. Demolition: The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

t. Disposal Bag: A 6 mil thick, leak-tight plastic bag, pre-labeled in accordance with 29 CFR 1926, Section .1101, used for transporting asbestos waste from containment to disposal site.

u. Disturbance: Activities that disrupt the matrix of ACM, crumble or pulverize ACM, or generate visible debris from ACM. Disturbance includes cutting away small amounts of ACM, no greater than the amount which can be contained in 1 standard sized glovebag or waste bag, not larger than 60 inches in length and width in order to access a building component.

v. Equipment Room or Area: An area adjacent to the regulated area used for the decontamination of employees and their equipment.

w. Employee Exposure: That exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.

x. Fiber: A fibrous particulate, 5 micrometers or longer, with a length to width ratio of at least 3 to 1.

y. Friable ACM: A term defined in 40 CFR 61, Subpart M and EPA 340/1-90/018 meaning any material which contains more than 1 percent asbestos, as determined using the method specified in 40 CFR 763, Subpart E, Appendix A, Section 1, Polarized Light Microscopy (PLM), that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. If the asbestos content is less than 10 percent, as determined by a method other than point counting by PLM, the asbestos content is verified by point counting using PLM.

z. Glovebag: Not more than a 60 by 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.

aa. High-Efficiency Particulate Air (HEPA) Filter: A filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

bb. Homogeneous Area: An area of surfacing material or thermal system insulation that is uniform in color and texture.

cc. Industrial Hygienist: A professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational health hazards.

dd. Intact: ACM which has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix. Removal of "intact" asphaltic, resinous, cementitious products does not render the ACM

non-intact simply by being separated into smaller pieces.

ee. Model Accreditation Plan (MAP): USEPA training accreditation requirements for persons who work with asbestos as specified in 40 CFR 763, Subpart E, Appendix C.

ff. Modification: A changed or altered procedure, material or component of a control system, which replaces a procedure, material or component of a required system.

gg. Negative Exposure Assessment: A demonstration by the Contractor to show that employee exposure during an operation is expected to be consistently below the OSHA Permissible Exposure Limits (PELs).

hh. NESHAP: National Emission Standards for Hazardous Air Pollutants. The USEPA NESHAP regulation for asbestos is at 40 CFR 61, Subpart M.

ii. Nonfriable ACM: A NESHAP term defined in 40 CFR 61, Subpart M and EPA 340/1-90/018 meaning any material containing more than 1 percent asbestos, as determined using the method specified in 40 CFR 763, Subpart E, Appendix A, Section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

jj. Nonfriable ACM (Category I): A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90/018 meaning asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy.

kk. Nonfriable ACM (Category II): A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90/018 meaning any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos, as determined using the methods specified in 40 CFR 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

ll. Permissible Exposure Limits (PELs):

1. PEL-Time weighted average(TWA): Concentration of asbestos not in excess of 0.1 fibers per cubic centimeter of air (f/cc) as an 8 hour time weighted average (TWA), as determined by the method prescribed in 29 CFR 1926, Section .1101, Appendix A, or the current version of NIOSH 84-100 analytical method 7400.

2. PEL-Excursion Limit: An airborne concentration of asbestos not in excess of 1.0 f/cc of air as averaged over a sampling period of 30 minutes as determined by the method prescribed in 29 CFR 1926, Section .1101, Appendix A, or the current version of NIOSH 84-100 analytical method 7400.

mm. Regulated Area: An OSHA term defined in 29 CFR 1926, Section .1101 meaning an area established by the Contractor to demarcate areas where Class I, II, and III asbestos work is conducted; also any adjoining area where debris and waste from such asbestos work

accumulate; and an area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the permissible exposure limit.

nn. Removal: All operations where ACM is taken out or stripped from structures or substrates, and includes demolition operations.

pp. Spills/Emergency Cleanups: Cleanup of sizable amounts of asbestos waste and debris which has occurred, for example, when
water damage occurs in a building, and sizable amounts of ACM are dislodged. A Competent Person evaluates the site and ACM to be handled, and based on the type, condition and extent of the dislodged material, classifies the cleanup as Class I, II, or III. Only if the material was intact and the cleanup involves mere contact of ACM, rather than disturbance, could there be a Class IV classification.

qq. Surfacing ACM: Asbestos-containing material which contains more than 1% asbestos and is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

rr. Thermal system insulation (TSI) ACM: ACM which contains more than 1% asbestos and is applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain or water condensation.

ss. Transite: A generic name for asbestos cement wallboard and pipe.

tt. Worker: Individual (not designated as the Competent Person or a supervisor) who performs asbestos work and has completed asbestos worker training required by 29 CFR 1926, Section .1101, to include EPA Model Accreditation Plan (MAP) "Worker" training; accreditation required by 40 CFR 763, Subpart E, Appendix C, if required by the OSHA Class of work to be performed or by the state where the work is to be performed.

1.4 DESCRIPTION OF WORK

The work covered by this section includes the removal and disposal of all asbestos-containing materials (ACM)disturbed and all ACM present within the utilodor sections where work for this project is defined. Concrete sealants shall be removed to the unabraded surface to provide a clean and smooth surface to apply new sealant upon reassembly. Sealants in small pits and groves will not require abatement. Concrete sealants existing on joints that are not disturbed, will not require abatement.

This section describes the procedures and equipment required to protect workers and occupants of the regulated area from contact with airborne asbestos fibers and ACM dust and debris. Activities include OSHA Class I, Class II, Class III and Class IV work operations involving ACM. The work also includes containment, storage, transportation and disposal of the generated ACM wastes. More specific operational procedures shall be detailed in the required Accident Prevention Plan and its subcomponents, the Asbestos Hazard Abatement Plan and Activity Hazard Analyses required in paragraph SAFETY AND HEALTH PROGRAM AND PLANS.

1.4.1 Abatement Work Tasks

The specific ACM to be abated is identified on the detailed plans and project drawings. See Sheet C-2 for general hazard abatement notes. Materials and components with asbestos concentrations exceeding 1% are present in the utilidor system in the form of asbestos-containing materials used during original construction and subsequent maintenance operations and non-asbestos-containing materials that have become contaminated with asbestos-containing dust and debris transported via air and water migration and foot traffic from adjacent utilidor sections.

All existing sewer lines, gaskets, valve packing, lid, wall and floor section sealants, dust, debris and silt in all areas, including the dust on all surfaces within the utilidor sections to be impacted by this project are assumed to contain asbestos at concentrations exceeding 1%.

All thermal system insulation on all pipe systems in the utilidor main sections and laterals, except for the laterals connecting the mains to Buildings 3727 and 3728, and small sections of main utilidor sections that have been previously abated contain asbestos at concentrations greater than 1%. Sections of main utilors that have been previously abated have become recontaminated and shall be abated using Class I procedures.

1.4.2 Unexpected Discovery of Asbestos

For any previously unidentified building components suspected to contain asbestos and located in areas impacted by the work, the Contractor shall notify the Contracting Officer (CO) who will have the option of ordering up to 10 bulk samples to be obtained at the Contractor's expense and delivered to a laboratory accredited under the National Institute of Standards and Technology (NIST) "National Voluntary Laboratory Accreditation Program (NVLAP)" and analyzed by PLM at no additional cost to the Government. Any additional components identified as ACM that have been approved by the Contracting Officer for removal shall be removed by the Contractor and will be paid for by an equitable adjustment to the contract price under the CONTRACT CLAUSE titled "changes". Sampling activities undertaken to determine the presence of additional ACM shall be conducted by personnel who have successfully completed the EPA Model Accreditation Plan (MAP) "Building Inspector" training course required by 40 CFR 763, Subpart E, Appendix C.

1.5 QUALIFICATIONS

1.5.1 Written Qualifications and Organization Report

The Contractor shall furnish a written qualifications and organization report providing evidence of qualifications of the Contractor, Contractor's Project Supervisor, Designated Competent Person, supervisors and workers; Designated IH (person assigned to project and firm name); independent testing laboratory (including name of firm, principal, and analysts who will perform analyses); all subcontractors to be used including disposal transportation and disposal facility firms, subcontractor supervisors, subcontractor workers; and any others assigned to perform asbestos abatement and support activities. The report shall include an organization chart showing the Contractor's staff organization for this project by name and title, chain of command and reporting relationship with all subcontractors. The report shall be

signed by the Contractor, the Contractor's onsite project manager, Designated Competent Person, Designated IH, designated testing laboratory and the principals of all subcontractors to be used. The Contractor shall include the following statement in the report: "By signing this report I certify that the personnel I am responsible for during the course of this project fully understand the contents of 29 CFR 1926, Section .1101, 40 CFR 61, Subpart M, and the federal, state and local requirements
for those asbestos abatement activities that they will be involved in."

1.5.2 Specific Requirements

The Contractor shall designate in writing, personnel meeting the following qualifications:

a. Designated Competent Person: The name, address, telephone number, and resume of the Contractor's Designated Competent Person shall be provided. Evidence that the full-time Designated Competent Person is qualified in accordance with 29 CFR 1926, Sections .32 and .1101, has EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training accreditation required by 40 CFR 763, Subpart E, Appendix C, and is experienced in the administration and supervision of asbestos abatement projects. The Designated Competent Person shall be responsible for compliance with applicable federal, state and local requirements, the Contractor's Accident Prevention Plan and Asbestos Hazard Abatement Plan. The Designated Competent Person shall provide, and the Contractor shall submit, the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training with the employee "Certificate of Worker Acknowledgment" required by this paragraph. The Contractor shall submit evidence that this person has a minimum of 2 years of on-the-job asbestos abatement experience relevant to OSHA competent person requirements. The Designated Competent Person shall be onsite at all times during the performance of asbestos-related work for this project.

b. Project and Other Supervisors: The Contractor shall provide the name, address, telephone number, and resume of the Project Supervisor and other supervisors who have responsibility to implement the Accident Prevention Plan, including the Asbestos Hazard Abatement Plan and Activity Hazard Analyses, the authority to direct work performed under this contract and verify compliance, and have EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training accreditation required by 40 CFR 763, Subpart E, Appendix C. The Project Supervisor and other supervisors shall provide, and the Contractor shall submit, the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training with the employee "Certificate of Worker Acknowledgment" required by this paragraph. The Contractor shall submit evidence that the Project Supervisor has a minimum of 2 years of on-the-job asbestos abatement experience relevant to project supervisor responsibilities and the other supervisors have a minimum of 1 year on-the-job asbestos abatement experience commensurate with the responsibilities they will have on this project.

c. Designated Industrial Hygienist: The Contractor shall provide

the name, address, telephone number, resume and other information specified below for the Industrial Hygienist (IH) selected to prepare the Contractor's Asbestos Hazard Abatement Plan, prepare and perform training, direct air monitoring and assist the Contractor's Competent Person in implementing and ensuring that safety and health requirements are complied with during the performance of all required work. The Designated IH shall be a person who is board eligible (meets all education and experience requirements) as determined and documented by the American Board of Industrial Hygiene (ABIH), has EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training accreditation required by 40 CFR 763, Subpart E, Appendix C, and has a minimum of 2 years of comprehensive experience in planning and overseeing asbestos abatement activities. The Designated IH shall provide, and the Contractor shall submit, the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training with the employee "Certificate of Worker Acknowledgment" required by this paragraph. The Designated IH shall be completely independent from the Contractor according to federal, state, or local regulations; that is, shall not be a Contractor's employee or be an employee or principal of a firm in a business relationship with the Contractor negating such independent status. A copy of the Designated IH's current valid ABIH certification or confirmation of eligibility in writing from the ABIH shall be included. The Designated IH shall visit the site at least once per week for the duration of asbestos activities and shall be available for emergencies. In addition, the Designated IH shall prepare, and the Contractor shall submit, the name, address, telephone numbers and resumes of additional IH's and industrial hygiene technicians (IHT) who will be assisting the Designated IH in performing onsite tasks. IHs and IHTs supporting the Designated IH shall have a minimum of 2 years of practical onsite asbestos abatement experience. The formal reporting relationship between the Designated IH and the support IHs and IHTs, the Designated Competent Person, and the Contractor shall be indicated.

d. Asbestos Abatement Workers: Asbestos abatement workers shall meet the requirements contained in 29 CFR 1926, Section .1101, 40 CFR 61, Subpart M, and other applicable federal, state and local requirements. Worker training documentation shall be provided as required on the "Certificate of Workers Acknowledgment" in this paragraph.

e. Worker Training and Certification of Worker Acknowledgment: Training documentation will be required for each employee who will perform asbestos abatement operations. Such documentation shall be submitted on a Contractor generated form titled "Certificate of Workers Acknowledgment", to be completed for each employee in the same format and containing the same information as the example certificate at the end of this section. Training course completion certificates (initial and most recent update refresher) required by the information checked on the form shall be attached.

f. Physician: The Contractor shall provide the name, medical qualifications, address, telephone number and resume of the physician who will or has performed the medical examinations and

evaluations of the persons who will conduct the asbestos abatement work tasks. The physician shall be currently licensed by the state where the workers will be or have been examined, have expertise in pneumoconiosis and shall be responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with 29 CFR 1926, Section .1101 and paragraph MEDICAL REQUIREMENTS. The physician shall be familiar with the hazards and the scope of activities associated with this project.

g. First Aid and CPR Trained Persons: The names of at least 2 persons who are currently trained in first aid and CPR by the American Red Cross or other approved agency shall be designated and shall be onsite at all times during site operations. They shall be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910, Section .1030 and shall be included in the Contractor's Bloodborne Pathogen Program. These persons may perform other duties but shall be immediately available to render first aid when needed. A copy of each designated person's current valid First Aid and CPR certificate shall be provided.

h. Independent Testing Laboratory: The Contractor shall provide the name, address and telephone number of the independent testing laboratory selected to perform the sample analyses and report the results. The testing laboratory shall be completely independent from the Contractor as recognized by federal, state or local regulations. Written verification of the following criteria, signed by the testing laboratory principal and the Contractor, shall be submitted:

1. Phase contrast microscopy (PCM): The laboratory is fully equipped and proficient in conducting PCM of airborne samples using the methods specified by 29 CFR 1926, Section .1101, OSHA method ID-160, the most current version of NIOSH 84-100 Method 7400, and NIOSH 84-100 Method 7402, transmission electron microscopy (TEM); the laboratory is currently judged proficient (classified as acceptable) in counting airborne asbestos samples by PCM by successful participation in each of the last 4 rounds in the American Industrial Hygiene Association (AIHA) Proficiency Analytical Testing (PAT) Program; the names of the selected microscopists who will analyze airborne samples by PCM with verified documentation of their proficiency to conduct PCM analyses by being judged proficient in counting samples as current participating analysts in the AIHA PAT Program, and having successfully completed the Asbestos Sampling and Analysis course (NIOSH 582 or equivalent) with a copy of course completion certificate provided; when the PCM analysis is to be conducted onsite, documentation shall be provided certifying that the onsite analyst meets the same requirements.

2. Polarized light microscopy (PLM): The laboratory is fully equipped and proficient in conducting PLM analyses of suspect ACM bulk samples in accordance with 40 CFR 763, Subpart E, Appendix E; the laboratory is currently accredited by NIST under the NVLAP for bulk asbestos analysis and will use analysts (names shall be provided) with demonstrated proficiency to conduct PLM to include its application to the identification and quantification of asbestos content.

3. PCM/TEM: The laboratory is fully equipped and each analyst (name shall be provided) possesses demonstrated proficiency in conducting PCM and TEM analysis of airborne samples using NIOSH 84-100Method 7400 PCM and NIOSH 84-100 Method 7402 (TEM confirmation of asbestos content of PCM results) from the same filter.

i. Disposal Facility, Transporter: All ACM shall be disposed of at the Ft. Wainwright landfill. Copies of signed agreements between the Contractor, subcontractors and transporters of all asbestos containing waste generated during the performance of this contract shall be provided. Qualifications shall be provided for each subcontractor or transporter to be used, indicating previous experience in transport and disposal of asbestos waste to include all required state and local waste hauler requirements for asbestos. The Contractor and transporters shall meet the DOT requirements of 49 CFR 171, 49 CFR 172, and 49 CFR 173 as well as registration requirements of 49 CFR 107 and other applicable state or local requirements. The disposal facility shall meet the requirements of 40 CFR 61, Sections .154 or .155, as required in 40 CFR 61, Section .150(b), and other applicable state or local requirements.

1.6 REGULATORY REQUIREMENTS

In addition to detailed requirements of this specification, work performed under this contract shall comply with EM 385-1-1, applicable federal, state, and local laws, ordinances, criteria, rules and regulations regarding handling, storing, transporting, and disposing of asbestos waste materials. This includes, but is not limited to, OSHA standards, 29 CFR 1926, especially Section .1101, 40 CFR 61, Subpart M, 8 AAC 61, 18 AAC 60 and 40 CFR 763. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.7 SAFETY AND HEALTH PROGRAM AND PLANS

The Contractor shall develop and submit a written comprehensive site-specific Accident Prevention Plan at least 35 days prior to the preconstruction conference. The Accident Prevention Plan shall address requirements of EM 385-1-1, Appendix A, covering onsite work to be performed by the Contractor and subcontractors. The Accident Prevention Plan shall incorporate an Asbestos Hazard Abatement Plan, and Activity Hazard Analyses as separate appendices into 1 site specific Accident Prevention Plan document. Any portions of the Contractor's overall Safety and Health Program that are referenced in the Accident Prevention Plan, e.g., respirator program, hazard communication program, confined space entry program, etc., shall be included as appendices to the Accident Prevention Plan. The plan shall be prepared, signed and dated by the Contractor's Designated IH, Competent Person, and Project Supervisor.

1.7.1 Asbestos Hazard Abatement Plan Appendix

The Asbestos Hazard Abatement Plan appendix to the Accident Prevention Plan shall include, but not be limited to, the following:

a. The personal protective equipment to be used;

b. The location and description of regulated areas including clean and dirty areas, and decontamination unit (clean room, shower room, equipment room, storage areas such as load-out unit);

c. Initial exposure assessment in accordance with 29 CFR 1926, Section .1101;

d. Level of supervision;

e. Method of notification of other employers at the worksite;

f. Abatement method to include containment and control procedures;

g. Interface of trades involved in the construction;

h. Sequencing of asbestos related work;

i. Storage and disposal procedures and plan;

j. Type of wetting agent and asbestos encapsulant to be used;

k. Location of local exhaust equipment;

l. Air monitoring methods (personal, environmental and clearance);

m. Bulk sampling and analytical methods (if required);

n. A detailed description of the method to be employed in order to control the spread of ACM wastes and airborne fiber concentrations;

o. Fire and medical emergency response procedures;

p. The security procedures to be used for all regulated areas.

1.7.2 Activity Hazard Analyses Appendix

Activity Hazard Analyses, for each major phase of work, shall be submitted and updated during the project. The Activity Hazard Analyses format shall be in accordance with EM 385-1-1 (Figure 1-1). The analysis shall define the activities to be performed for a major phase of work, identify the sequence of work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level. Work shall not proceed on that phase until the Activity Hazard Analyses has been accepted and a preparatory meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activities, including the onsite Government representatives. The Activity Hazard Analyses shall be continuously reviewed and, when appropriate, modified to address changing site conditions or operations.

1.8 PRECONSTRUCTION CONFERENCE AND ONSITE SAFETY

The Contractor and the Contractor's Designated Competent Person, Project Supervisor, and Designated IH shall meet with the Contracting Officer prior to beginning work at a safety preconstruction conference to

discuss the details of the Contractor's submitted Accident Prevention Plan to include the Asbestos Hazard Abatement Plan and Activity Hazard Analyses appendices. Deficiencies in the Accident Prevention Plan will be discussed and the Accident Prevention Plan shall be revised to correct the deficiencies and resubmitted for acceptance. Any changes required in the specification as a result of the Accident Prevention Plan shall be identified specifically in the plan to allow for free discussion and acceptance by the Contracting Officer, prior to the start of work. Onsite work shall not begin until the Accident Prevention Plan has been accepted. A copy of the written Accident Prevention Plan shall be maintained onsite. Changes and modifications to the accepted Accident Prevention Plan shall be made with the knowledge and concurrence of the Designated IH, the Project Supervisor, Designated Competent Person, and the Contracting Officer. Should any unforeseen hazard become evident during the performance of the work, the Designated IH shall bring such hazard to the attention of the Project Supervisor, Designated Competent Person, and the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, all necessary action shall be taken by the Contractor to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Once accepted by the Contracting Officer, the Accident Prevention Plan, including the Asbestos Hazard Abatement Plan and Activity Hazard Analyses will be enforced as if an addition to the contract. Disregarding the provisions of this contract or the accepted Accident Prevention Plan will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

1.9 SECURITY

Fenced and locked security areas shall be provided for each regulated area. A log book shall be kept documenting entry into and out of the regulated area. Entry into regulated areas shall only be by personnel authorized by the Contractor and the Contracting Officer. Personnel authorized to enter regulated areas shall be trained, be medically evaluated, and wear the required personal protective equipment for the specific regulated area to be entered.

1.10 MEDICAL REQUIREMENTS

Medical requirements shall conform to 29 CFR 1926, Section .1101.

1.10.1 Medical Examinations

Before being exposed to airborne asbestos fibers, workers shall be provided with a medical examination as required by 29 CFR 1926, Section .1101 and other pertinent state or local requirements. This requirement shall have been satisfied within the last 12 months. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation. X-ray films of asbestos workers shall be identified to the consulting radiologist and medical record jackets shall be marked with the word "asbestos."

1.10.1.1 Information Provided to the Physician

The Contractor shall provide the following information in writing to the examining physician:

a. A copy of 29 CFR 1926, Section .1101 and Appendices D, E, G, and I;

b. A description of the affected employee's duties as they relate to the employee's exposure;

c. The employee's representative exposure level or anticipated exposure level;

d. A description of any personal protective and respiratory equipment used or to be used;

e. Information from previous medical examinations of the affected employee that is not otherwise available to the examining physician.

1.10.1.2 Written Medical Opinion

For each worker, a written medical opinion prepared and signed by a licensed physician indicating the following:

a. Summary of the results of the examination.

b. The potential for an existing physiological condition that would place the employee at an increased risk of health impairment from exposure to asbestos.

c. The ability of the individual to wear personal protective equipment, including respirators, while performing strenuous work tasks under cold and/or heat stress conditions.

d. A statement that the employee has been informed of the results of the examination, provided with a copy of the results, informed of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure, and informed of any medical condition that may result from asbestos exposure.

1.10.2 Medical and Exposure Records

Complete and accurate records shall be maintained of each employee's medical examinations, medical records, and exposure data, as required by 29 CFR 1910, Section .1910.20 and 29 CFR 1926, Section .1101 for a period of 50 years after termination of employment. Records of the required medical examinations and exposure data shall be made available, for inspection and copying, to the Assistant Secretary of Labor for Occupational Safety and Health (OSHA) or authorized representatives of the employee and an employee's physician upon request of the employee or former employee.

1.11 TRAINING PROGRAM

1.11.1 General Training Requirements

The Contractor shall establish a training program as specified by EPA Model Accreditation Plan (MAP), training requirements at 40 CFR 763, Subpart E, Appendix C, OSHA requirements of 29 CFR 1926, Section .1101(k)(9), and this specification. Contractor employees shall complete the required training for the type of work they are to perform and such

training shall be documented and provided to the Contracting Officer as specified in paragraph QUALIFICATIONS.

1.11.2 Project Specific Training

Prior to commencement of work, each worker shall be instructed in the following project specific training:

a. The hazards and health effects of the specific types of ACM to be abated;

b. The content and requirements of the Contractor's Accident Prevention Plan to include the Asbestos Hazard Abatement Plan and Activity Hazard Analyses and site-specific safety and health precautions;

c. Hazard Communication Program;

d. Hands-on training for each asbestos abatement technique to be employed;

e. Heat and/or cold stress monitoring specific to this project;

f. Air monitoring program and procedures;

g. Medical surveillance to include medical and exposure record-keeping procedures;

h. The association of cigarette smoke and asbestos-related disease;

i. Security procedures;

j. Specific work practice controls and engineering controls required for each Class of work in accordance with 29 CFR 1926, Section .1101.

1.12 RESPIRATORY PROTECTION PROGRAM

The Contractor shall establish in writing, and implement a respiratory protection program in accordance with 29 CFR 1926, Section .1101, 29 CFR 1910, Section .134, ANSI Z88.2, CGA G-7, and CGA G-7.1. The Contractor shall establish minimum respiratory protection requirements based on measured or anticipated levels of airborne asbestos fiber concentrations encountered during the performance of the asbestos abatement work. The Contractor's respiratory protection program shall include, but not be limited to, the following elements:

a. The company policy, used for the assignment of individual responsibility, accountability, and implementation of the respiratory protection program.

b. The standard operating procedures covering the selection and use of respirators. Respiratory selection shall be determined by the hazard to which the worker is exposed.

c. Medical evaluation of each user to verify that the worker may be assigned to an activity where respiratory protection is required.

d. Training in the proper use and limitations of respirators.

e. Respirator fit-testing, i.e., quantitative, qualitative and individual functional fit checks.

f. Regular cleaning and disinfection of respirators.

g. Routine inspection of respirators during cleaning and after each use when designated for emergency use.

h. Storage of respirators in convenient, clean, and sanitary locations.

i. Surveillance of regulated area conditions and degree of employee exposure (e.g., through air monitoring).

j. Regular evaluation of the continued effectiveness of the respiratory protection program.

k. Recognition and procedures for the resolution of special problems as they affect respirator use (e.g., no facial hair that comes between the respirator face piece and face or interferes with valve function; prescription eye wear usage; contact lenses usage; etc.).

l. Proper training in putting on and removing respirators.

1.12.1 Respiratory Fit Testing

A qualitative or quantitative fit test conforming to 29 CFR 1926, Section 1101, Appendix C shall be conducted for each Contractor worker required to wear a respirator. A respirator fit test shall be performed for each worker wearing a negative-pressure respirator prior to initially wearing a respirator on this project and every 6 months thereafter. The qualitative fit tests may be used only for testing the fit of half-mask respirators where they are permitted to be worn, or of full-facepiece air purifying respirators where they are worn at levels at which half-facepiece air purifying respirators are permitted. If physical changes develop that will affect the fit, a new fit test for the worker shall be performed. Functional fit checks shall be performed by employees each time a respirator is put on and in accordance with the manufacturer's recommendation.

1.12.2 Respirator Selection and Use Requirements

The Contractor shall provide respirators, and ensure that they are used as required by 29 CFR 1926, Section .1101 and in accordance with the manufacturer's recommendations. Respirators shall be jointly approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (MSHA/NIOSH), or by NIOSH, under the provisions of 42 CFR 84, for use in environments containing airborne asbestos fibers. The initial respirator selection and the decisions regarding the upgrading or downgrading of respirator type shall be made by the Contractor's Designated IH based on the measured or anticipated airborne asbestos fiber concentrations to be encountered. Recommendations made by the Contractor's Designated IH to downgrade respirator type shall be submitted in writing to the Contracting Officer. The Contractor's Designated Competent Person in consultation with the Designated IH, shall have the authority to take immediate

action to upgrade or downgrade respiratory type when there is an immediate danger to the health and safety of the wearer. Respirators shall be used in the following circumstances:

a. During all Class I asbestos jobs.

b. During all Class II work where the ACM is not removed in a substantially intact state.

c. During all Class II and III work which is not performed using wet methods. Respirators need not be worn during removal of ACM when a negative exposure assessment has been made and ACM is removed in an intact state.

d. During all Class II and III asbestos jobs where the Contractor does not produce a negative exposure assessment.

e. During all Class III jobs where TSI or surfacing ACM is being disturbed.

f. During all Class IV work performed within regulated areas where employees performing other work are required to wear respirators.

g. During all work where employees are exposed above the PEL-TWA or PEL-Excursion Limit.

h. In emergencies

1.12.3 Class I Work

The Contractor shall provide: (1) a tight-fitting, powered air purifying respirator equipped with high efficiency filters, or (2) a full-facepiece supplied air respirator operated in the pressure demand mode, equipped with HEPA egress cartridges, or (3) an auxiliary positive pressure self-contained breathing apparatus, for all employees within the regulated area where Class I work is being performed; provided that a negative exposure assessment has not been produced, and that the exposure level will not exceed 1 f/cc as an 8-hour time weighted average. A full-facepiece supplied air respirator, operated in the pressure demand mode, equipped with an auxiliary positive pressure self-contained breathing apparatus shall be provided under such conditions, if the exposure assessment indicates exposure levels above 1 f/cc as an 8-hour time weighted average.

1.12.4 Class II and III Work

The Contractor shall provide an air purifying respirator, other than a disposable respirator, equipped with high-efficiency filters whenever the employee performs Class II and III asbestos jobs where the Contractor does not produce a negative exposure assessment; and Class III jobs where TSI or surfacing ACM is being disturbed.

1.12.5 Sanitation

Employees who wear respirators shall be permitted to leave work areas to wash their faces and respirator facepieces whenever necessary to prevent skin irritation associated with respirator use.

1.13 HAZARD COMMUNICATION PROGRAM

A hazard communication program shall be established and implemented in accordance with 29 CFR 1926, Section .59. Material safety data sheets (MSDSs) shall be provided for all hazardous materials brought onto the worksite. One copy shall be provided to the Contracting Officer and 1 copy shall be included in the Contractor's Hazard Communication Program.

1.14 LICENSES, PERMITS AND NOTIFICATIONS

1.14.1 General Legal Requirements

Necessary licenses, permits and notifications shall be obtained in conjunction with the project's asbestos abatement, transportation and disposal actions and timely notification furnished of such actions as required by federal, state, regional, and local authorities. The Contractor shall notify the Regional Office of the USEPA and the Alaska Department of Labor in writing, at least 10 days prior to the commencement of work, in accordance with 40 CFR 61, Subpart M, and state and local requirements to include the mandatory "Notification of Demolition and Renovation Record" form and other required notification documents. Notification shall be by Certified Mail, Return Receipt Requested. The Contractor shall furnish copies of the receipts to the Contracting Officer, in writing, prior to the commencement of work. A copy of the rental company's written acknowledgment and agreement shall be provided as required by paragraph RENTAL EQUIPMENT. For licenses, permits, and notifications that the Contractor is responsible for obtaining, the Contractor shall pay any associated fees or other costs incurred.

1.15 PERSONAL PROTECTIVE EQUIPMENT

Three complete sets of personal protective equipment shall be made available to the Contracting Officer and authorized visitors for entry to the regulated area. Contracting Officer and authorized visitors shall be provided with training equivalent to that provided to Contractor employees in the selection, fitting, and use of the required personal protective equipment and the site safety and health requirements. Contractor workers shall be provided with personal protective clothing and equipment and the Contractor shall ensure that it is worn properly. The Contractor's Designated IH and Designated Competent Person shall select and approve all the required personal protective clothing and equipment to be used.

1.15.1 Respirators

Respirators shall be in accordance with paragraph RESPIRATORY PROTECTION PROGRAM.

1.15.2 Whole Body Protection

Personnel exposed to airborne concentrations of asbestos that exceed the PELs, or for all OSHA Classes of work for which a required negative exposure assessment is not produced, shall be provided with whole body protection and such protection shall be worn properly. The Contractor's Designated IH and Competent Person shall select and approve the whole body protection to be used. The Competent Person shall examine work suits worn by employees at least once per work shift for rips or tears that may occur during performance of work. When rips or tears are detected while an employee is working, rips and tears shall be

immediately mended, or the work suit shall be immediately replaced. Disposable whole body protection shall be disposed of as asbestos contaminated waste upon exiting from the regulated area. Reusable whole body protection worn shall be either disposed of as asbestos contaminated waste upon exiting from the regulated area or be properly laundered in accordance with 29 CFR 1926, Section .1101. Whole body protection used for asbestos abatement shall not be removed from the worksite by a worker to be cleaned. Recommendations made by the Contractor's Designated IH to downgrade whole body protection shall be submitted in writing to the Contracting Officer. The Contractor's Designated Competent Person, in consultation with the Designated IH, has the authority to take immediate action to upgrade or downgrade whole body protection when there is an immediate danger to the health and safety of the wearer.

1.15.2.1 Coveralls

Disposable-breathable or Reusable coveralls with a zipper front shall be provided. Sleeves shall be secured at the wrists, and foot coverings secured at the ankles

1.15.2.2 Underwear

Disposable underwear shall be provided. If reusable underwear are used, they shall be disposed of as asbestos contaminated waste or laundered in accordance with 29 CFR 1926, Section .1101. Asbestos abatement workers shall not remove contaminated reusable underwear worn during abatement of ACM from the site to be laundered.

1.15.2.3 Work Clothing

An additional coverall shall be provided when the abatement and control method employed does not provide for the exit from the regulated area directly into an attached decontamination unit. Cloth work clothes for wear under the protective coverall, and foot coverings, shall be provided when work is being conducted in low temperature conditions. Cloth work clothes shall be either disposed of as asbestos contaminated waste or properly laundered in accordance with 29 CFR 1926, Section .1101.

1.15.2.4 Gloves

Gloves shall be provided to protect the hands. Where there is the potential for hand injuries (i.e., scrapes, punctures, cuts, etc.) a suitable glove shall be provided and used.

1.15.2.5 Foot Coverings

Cloth socks shall be provided and worn next to the skin. Footwear, as required by OSHA and EM 385-1-1, that is appropriate for safety and health hazards in the area shall be worn. Rubber boots shall be used in moist or wet areas. Reusable footwear removed from the regulated area shall be thoroughly decontaminated or disposed of as ACM waste. Disposable protective foot covering shall be disposed of as ACM waste. If rubber boots are not used, disposable foot covering shall be provided.

1.15.2.6 Head Covering

Hood type head covering shall be provided. In addition, protective head gear (hard hats) shall be provided as required. Hard hats shall only be

removed from the regulated area after being thoroughly decontaminated.

1.15.2.7 Protective Eye Wear

Eye protection provided shall be in accordance with ANSI Z87.1.

1.16 HYGIENE FACILITIES AND PRACTICES

The Contractor shall establish a decontamination area for the decontamination of employees, material and equipment. The Contractor shall ensure that employees enter and exit the regulated area through the decontamination area.

1.16.1 Shower Facilities

Shower facilities, when provided, shall comply with 29 CFR 1910, Section .141(d)(3

1.16.2 3-Stage Decontamination Area

A temporary decontamination unit that is adjacent and attached in a leak-tight manner to the regulated area shall be provided. Utilization of prefabricated units shall have prior approval of the Contracting Officer. The decontamination unit shall have an equipment room and a clean room separated by a shower that complies with 29 CFR 1910, Section .141. Equipment and surfaces of containers filled with ACM shall be cleaned prior to removing them from the equipment room or area. Surfaces of the equipment room shall be wet wiped 2 times after each shift. Materials used for wet wiping shall be disposed of as asbestos contaminated waste. Two separate lockers shall be provided for each asbestos worker, one in the equipment room and one in the clean room. Used shower water shall be collected and filtered to remove asbestos contamination. Filters and residue shall be disposed of as asbestos contaminated material Filtered water shall be discharged to the sanitary system. Wastewater filters shall be installed in series with the first stage pore size of 20 microns and the second stage pore size of 5 microns. The floor of the decontamination unit's clean room shall be kept dry and clean at all times. Water from the shower shall not be allowed to wet the floor in the clean room. Surfaces of the clean room and shower shall be wet-wiped 2 times after each shift change with a disinfectant solution. Proper housekeeping and hygiene requirements shall be maintained. Soap and towels shall be provided for showering, washing and drying. Any cloth towels provided shall be disposed of as ACM waste or shall be laundered in accordance with 29 CFR 1926, Section .1101.

1.16.3 Load-Out Unit

A temporary load-out unit that is adjacent and connected to the regulated area shall be provided. Utilization of prefabricated units shall have prior approval of the Contracting Officer. The load-out unit shall be attached in a leak-tight manner to each regulated area. Surfaces of the load-out unit shall be adequately wet-wiped 2 times after each shift change. Materials used for wet wiping shall be disposed of as asbestos contaminated waste.

1.16.4 Single Stage Decontamination Area

A decontamination area (equipment room/area) shall be provided for Class I work involving less than 25 feet or 10 square feet of TSI or surfacing ACM, and for Class II and Class III asbestos work operations

where exposures exceed the PELs or where there is no negative exposure assessment produced before the operation. The equipment room or area shall be adjacent to the regulated area for the decontamination of employees, material, and their equipment which is contaminated with asbestos. The equipment room or area shall consist of an area covered by an impermeable drop cloth on the floor or horizontal working surface. The area must be of sufficient size to accommodate cleaning of equipment and removing personal protective equipment without spreading contamination beyond the area. Surfaces of the equipment room shall be wet wiped 2 times after each shift. Materials used for wet wiping shall be disposed of as asbestos contaminated waste.

1.16.5 Decontamination Requirements for Class IV Work

The Contractor shall ensure that employees performing Class IV work within a regulated area comply with the hygiene practice required of employees performing work which has a higher classification within that regulated area, or the Contractor shall provide alternate decontamination area facilities for employees cleaning up debris and material which is TSI or surfacing ACM.

1.16.6 Decontamination Area Entry Procedures

The Contractor shall ensure that employees entering the decontamination area through the clean room or clean area:

a. Remove street clothing in the clean room or clean area and deposit it in lockers.

b. Put on protective clothing and respiratory protection before leaving the clean room or clean area.

c. Pass through the equipment room to enter the regulated area.

1.16.7 Decontamination Area Exit Procedures

The Contractor shall ensure that the following procedures are followed:

a. Before leaving the regulated area, respirators shall be worn while employees remove all gross contamination and debris from their work clothing using a HEPA vacuum.

b. Employees shall remove their protective clothing in the equipment room and deposit the clothing in labeled impermeable bags or containers for disposal and/or laundering.

c. Employees shall not remove their respirators in the equipment room.

d. Employees shall shower prior to entering the clean room. If a shower has not been located between the equipment room and the clean room or the work is performed outdoors, the Contractor shall ensure that employees engaged in Class I asbestos jobs: a) Remove asbestos contamination from their work suits in the equipment room or decontamination area using a HEPA vacuum before proceeding to a shower that is not adjacent to the work area; or b) Remove their contaminated work suits in the equipment room, without cleaning worksuits, and proceed to a shower that is not adjacent to the work area.

e. After showering, employees shall enter the clean room before changing into street clothes.

1.16.8 Lunch Areas

The Contractor shall provide lunch areas in which the airborne concentrations of asbestos are below 0.01 f/cc.

1.16.9 Smoking

Smoking, if allowed by the Contractor, shall only be permitted in designated areas approved by the Contracting Officer.

1.17 REGULATED AREAS

All Class I, II, and III asbestos work shall be conducted within regulated areas. The regulated area shall be demarcated to minimize the number of persons within the area and to protect persons outside the area from exposure to airborne asbestos. Where critical barriers or negative pressure enclosures are used, they shall demarcate the regulated area. Access to regulated areas shall be limited to authorized persons. The Contractor shall control access to regulated areas, ensure that only authorized personnel enter, and verify that Contractor required medical surveillance, training and respiratory protection program requirements are met prior to allowing entrance.

1.18 WARNING SIGNS AND TAPE

Warning signs and tape printed in English shall be provided at the regulated boundaries and entrances to regulated areas. The Contractor shall ensure that all personnel working in areas contiguous to regulated areas comprehend the warning signs. Signs shall be located to allow personnel to read the signs and take the necessary protective steps required before entering the area. Warning signs shall be in vertical format conforming to 29 CFR 1910 and 29 CFR 1926, Section .1101, a minimum of 20 by 14 inches, and displaying the following legend in the lower panel:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

Spacing between lines shall be at least equal to the height of the upper of any two lines.

1.19 WARNING LABELS

Warning labels shall be affixed to all asbestos disposal containers used to contain asbestos materials, scrap, waste debris, and other products contaminated with asbestos. Containers with preprinted warning labels conforming to requirements are acceptable. Warning labels shall conform to 29 CFR 1926, Section .1101 and shall be of sufficient size to be clearly legible displaying the following legend:

DANGER
CONTAINS ASBESTOS FIBERS

AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

1.20 MATERIALS AND EQUIPMENT

Manufacturer's catalog data for all materials and equipment to be used in the work, including brand name, model, capacity, performance characteristics and any other pertinent information. Test results and certificates from the manufacturer of encapsulants substantiating compliance with performance requirements of this specification. Material Safety Data Sheets for all chemicals to be used onsite in the same format as implemented in the Contractor's HAZARD COMMUNICATION PROGRAM. Data shall include, but shall not be limited to, the following items, if they will be used:

SD-03 Product Data

a. High Efficiency Filtered Air (HEPA) local exhaust equipment

b. Vacuum cleaning equipment

c. Pressure differential monitor for HEPA local exhaust equipment

d. Air monitoring equipment

e. Respirators

f. Personal protective clothing and equipment

g. Glovebag

h. Duct Tape

i. Disposal Containers

j. Sheet Plastic

k. Wetting Agent

1. Amended Water

2. Removal encapsulant

l. Strippable Coating

m. Prefabricated Decontamination Unit

n. Other items

o. Material Safety Data Sheets (for all chemicals proposed)

1.21 VACUUM, FILTRATION AND VENTILATION EQUIPMENT

Manufacturer's certifications showing compliance with ANSI Z9.2 for:

a. Vacuums.

b. Water filtration equipment.

c. Ventilation equipment.

d. Other equipment required to contain airborne asbestos fibers.

1.22 LOCAL EXHAUST VENTILATION

Local exhaust ventilation units shall conform to ANSI Z9.2 and 29 CFR 1926, Section .1101. Filters on local exhaust system equipment shall conform to ANSI Z9.2 and UL 586. Filter shall be UL labeled.

1.23 TOOLS

Vacuums shall be leak proof to the filter, equipped with HEPA filters, of sufficient capacity and necessary capture velocity at the nozzle or nozzle attachment to efficiently collect, transport and retain the ACM waste material. Power tools shall not be used to remove ACM unless the tool is equipped with effective, integral HEPA filtered exhaust ventilation capture and collection system, or has otherwise been approved for use by the Contracting Officer. Residual asbestos shall be removed from reusable tools prior to storage and reuse. Reusable tools shall be thoroughly decontaminated prior to being removed from regulated areas.

1.24 RENTAL EQUIPMENT

If rental equipment is to be used, written notification shall be provided to the rental agency, concerning the intended use of the equipment, the possibility of asbestos contamination of the equipment and the steps that will be taken to decontaminate such equipment. A written acceptance of the terms of the Contractor's notification shall be obtained from the rental agency.

1.25 AIR MONITORING EQUIPMENT

The Contractor's Designated IH shall approve air monitoring equipment to be used to collect samples. The equipment shall include, but shall not be limited to:

a. High-volume sampling pumps that can be calibrated and operated at a constant airflow up to 16 liters per minute when equipped with a sampling train of tubing and filter cassette.

b. Low-volume, battery powered, body-attachable, portable personal pumps that can be calibrated to a constant airflow up to approximately 3.5 liters per minute when equipped with a sampling train of tubing and filter cassette, and a self-contained rechargeable power pack capable of sustaining the calibrated flow rate for a minimum of 10 hours. The pumps shall also be equipped with an automatic flow control unit which shall maintain a constant flow, even as filter resistance increases due to accumulation of fiber and debris on the filter surface.

c. Single use standard 25 mm diameter cassette, open face, 0.8 micron pore size, mixed cellulose ester membrane filters and cassettes with 50 mm electrically conductive extension cowl, and shrink bands, to be used with low flow pumps in accordance with 29 CFR 1926, Section .1101 for personal air sampling.

d. Single use standard 25 mm diameter cassette, open face, 0.45

micron pore size, mixed cellulose ester membrane filters and cassettes with 50 mm electrically conductive cowl, and shrink bands, to be used with high flow pumps when conducting environmental area sampling using NIOSH 84-100 Methods 7400 and 7402, (and the transmission electric microscopy method specified at 40 CFR 763 if required).

e. Appropriate plastic tubing to connect the air sampling pump to the selected filter cassette.

f. A flow calibrator capable of calibration to within plus or minus 2 percent of reading over a temperature range of minus 4 to plus 140 degrees F and traceable to a NIST primary standard.

1.26 EXPENDABLE SUPPLIES

1.26.1 Glovebag

Glovebags shall be provided as described in 29 CFR 1926, Section .1101. The glovebag assembly shall be 6 mil thick plastic, prefabricated and seamless at the bottom with preprinted OSHA warning label.

1.26.2 Duct Tape

Industrial grade duct tape of appropriate widths suitable for bonding sheet plastic and disposal container shall be provided.

1.26.3 Disposal Containers

Leak-tight (defined as solids, liquids, or dust that cannot escape or spill out) disposal containers shall be provided for ACM wastes as required by 29 CFR 1926 Section .1101.

1.26.4 Disposal Bags

Leak-tight bags, 6 mil thick, shall be provided for placement of asbestos generated waste.

1.26.5 Fiberboard Drums

Fiberboard drums shall be lined or coated and sealed to be leak-tight.

1.26.6 Cardboard Boxes

Heavy-duty corrugated cardboard boxes, coated with plastic or wax to retard deterioration from moisture. Boxes shall fit into selected ACM disposal bags. Filled boxes shall be sealed leak-tight with duct tape.

1.26.7 Sheet Plastic

Sheet plastic shall be polyethylene of 6 mil minimum thickness and shall be provided in the largest sheet size necessary to minimize seams Film shall conform to ASTM D 4397, except as specified below:

1.26.7.1 Flame Resistant

Where a potential for fire exists, flame-resistant sheets shall be provided. Film shall conform to the requirements of NFPA 701.

1.26.7.2 Reinforced

Reinforced sheets shall be provided where high skin strength is required, such as where it constitutes the only barrier between the regulated area and the outdoor environment. The sheet stock shall consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between 2 layers of polyethylene film. Film shall meet flame resistant standards of NFPA 701.

1.26.8 Amended Water

Amended water shall meet the requirements of ASTM D 1331.

1.26.9 Mastic Removing Solvent

Mastic removing solvent shall be nonflammable and shall not contain methylene chloride, glycol ether, or halogenated hydrocarbons. Solvents used onsite shall have a flash point greater than 140 degrees F.

1.26.10 Leak-tight Wrapping

Two layers of 6 mil minimum thick polyethylene sheet stock shall be used for the containment of removed asbestos-containing components or materials such as reactor vessels, large tanks, boilers, insulated pipe segments and other materials too large to be placed in disposal bags. Upon placement of the ACM component or material, each layer shall be individually leak-tight sealed with duct tape.

1.26.11 Viewing Inspection Window

Where feasible, a minimum of 1 clear, 1/8 inch thick, acrylic sheet, 18 by 24 inches, shall be installed as a viewing inspection window. The windows shall be sealed leak-tight with industrial grade duct tape.

1.26.12 Wetting Agents

Removal encapsulant (a penetrating encapsulant) shall be provided when conducting removal abatement activities that require a longer removal time or are subject to rapid evaporation of amended water. The removal encapsulant shall be capable of wetting the ACM and retarding fiber release during disturbance of the ACM greater than or equal to that provided by amended water.

1.26.13 Strippable Coating

If used, strippable coating in aerosol cans shall be used to adhere to surfaces and to be removed cleanly by stripping, at the completion of work. This work shall only be done in well ventilated areas.

1.27 MISCELLANEOUS ITEMS

A sufficient quantity of other items, such as, but not limited to: scrapers, brushes, brooms, staple guns, tarpaulins, shovels, rubber squeegees, dust pans, other tools, scaffolding, staging, enclosed chutes, wooden ladders, lumber necessary for the construction of containments, UL approved temporary electrical equipment, material and cords, ground fault circuit interrupters, water hoses of sufficient length, fire extinguishers, first aid kits, portable toilets, logbooks, log forms, markers with indelible ink, spray paint in bright color to

mark areas, project boundary fencing, etc., shall be provided.

PART 2 PRODUCTS

2.1 ENCAPSULANTS

Encapsulants shall conform to USEPA requirements, shall contain no toxic or hazardous substances and no solvent and shall meet the following requirements:

ALL ENCAPSULANTS

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E 84
Combustion Toxicity Zero Mortality	Univ. of Pittsburgh Protocol
Life Expectancy, 20 yrs Accelerated Aging Test	ASTM C 732
Permeability, Minimum 0.4 perms	ASTM E 96

Additional Requirements for Penetrating Encapsulant

Requirement	Test Standard
Cohesion/Adhesion Test, 50 pounds of force/foot	ASTM E 736
Fire Resistance, Negligible affect on fire resistance rating over 3 hour test(Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E 119
Impact Resistance, Minimum 43 in-lb (Gardner Impact Test)	ASTM D 2794
Flexibility, no rupture or cracking (Mandrel Bend Test)	ASTM D 522

Additional Requirements for Lockdown Encapsulant

Requirement	Test Standard
Fire Resistance, Negligible affect on fire resistance rating over 3 hour test(Tested with fireproofing over encapsulant applied directly to steel member)	ASTM E 119
Bond Strength, 100 pounds of force/foot (Tests compatibility with cementitious and fibrous fireproofing)	ASTM E 736

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Asbestos abatement work tasks are summarized in paragraph DESCRIPTION OF

WORK and are identified on the project plans. All associated work shall be incorporated into the Contractor's Accident Prevention Plan, Asbestos Hazard Abatement Plan, and the Activity Hazard Analyses. The Contractor shall use the engineering controls and work practices required in 29 CFR 1926, Section .1101(g) in all operations regardless of the levels of exposure. Personnel shall wear and utilize protective clothing and equipment as specified. The Contractor shall not permit eating, smoking, drinking, chewing or applying cosmetics in the regulated area. All hot work (burning, cutting, welding, etc.) shall be conducted under controlled conditions in conformance with 29 CFR 1926, Section .352, Fire Prevention. Personnel of other trades, not engaged in asbestos abatement activities, shall not be exposed at any time to airborne concentrations of asbestos unless all the administrative and personal protective provisions of the Contractor's Accident Prevention Plan are complied with. Power to the regulated area shall be locked-out and tagged in accordance with 29 CFR 1910, and temporary electrical service with ground fault circuit interrupters shall be provided as needed. Temporary electrical service shall be disconnected when necessary for wet removal. The Contractor shall stop abatement work in the regulated area immediately when the airborne total fiber concentration: (1) equals or exceeds 0.01 f/cc, or the pre-abatement concentration, whichever is greater, outside the regulated area; or (2) equals or exceeds 1.0 f/cc inside the regulated area. The Contractor shall correct the condition to the satisfaction of the Contracting Officer, including visual inspection and air sampling. Work shall resume only upon notification by the Contracting Officer. Corrective actions shall be documented.

3.2 PROTECTION OF ADJACENT WORK OR AREAS TO REMAIN

Asbestos abatement shall be performed without damage to or contamination of adjacent work or area. Where such work or area is damaged or contaminated, as verified by the Contracting Officer using visual inspection or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the Government, as deemed appropriate by the Contracting Officer. This includes inadvertent spill of dirt, dust or debris in which it is reasonable to conclude that asbestos may exist. When these spills occur, work shall stop in all effected areas immediately and the spill shall be cleaned. When satisfactory visual inspection and air sampling analysis results are obtained and have been evaluated by the Contractor's Designated IH and the Contracting Officer, work shall proceed.

3.3 BUILDING VENTILATION SYSTEM AND CRITICAL BARRIERS

Permanent, air-tight critical barriers shall be installed to separate the regulated areas from areas where work will not be performed.

3.4 METHODS OF COMPLIANCE

3.4.1 Mandated Practices

The Contractor shall employ proper handling procedures in accordance with 29 CFR 1926 and 40 CFR 61, Subpart M, and the specified requirements. The specific abatement techniques and items identified shall be detailed in the Contractor's Asbestos Hazard Abatement Plan

including, but not limited to, details of construction materials, equipment, and handling procedures. The Contractor shall use the following engineering controls and work practices in all operations, regardless of the levels of exposure:

a. Vacuum cleaners equipped with HEPA filters to collect debris and dust containing ACM.

b. Wet methods or wetting agents to control employee exposures during asbestos handling, mixing, removal, cutting, application, and cleanup; except where it can be demonstrated that the use of wet methods is unfeasible due to, for example, the creation of electrical hazards, equipment malfunction, and in roofing.

c. Prompt clean-up and disposalin leak-tight containers of wastes and debris contaminated with asbestos.

d. Inspection and repair of polyethylene in work and high traffic areas.

e. Cleaning of equipment and surfaces of containers filled with ACM prior to removing them from the equipment room or area.

3.4.2 Control Methods

The Contractor shall use the following control methods to comply with the PELs:

a. Local exhaust ventilation equipped with HEPA filter dust collection systems;

b. Enclosure or isolation of processes producing asbestos dust;

c. Ventilation of the regulated area to move contaminated air away from the breathing zone of employees and toward a filtration or collection device equipped with a HEPA filter;

d. Use of other work practices and engineering controls;

e. Where the feasible engineering and work practice controls described above are not sufficient to reduce employee exposure to or below the PELs, the Contractor shall use them to reduce employee exposure to the lowest levels attainable by these controls and shall supplement them by the use of respiratory protection that complies with paragraph, RESPIRATORY PROTECTION PROGRAM.

3.4.3 Unacceptable Practices

The following work practices and engineering controls shall not be used for work related to asbestos or for work which disturbs ACM, regardless of measured levels of asbestos exposure or the results of initial exposure assessments:

a. High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.

b. Compressed air used to remove asbestos, or materials containing asbestos, unless the compressed air is used in conjunction with

an enclosed ventilation system designed to capture the dust cloud created by the compressed air.

c. Dry sweeping, shoveling, or other dry clean-up of dust and debris containing ACM.

d. Employee rotation as a means of reducing employee exposure to asbestos.

3.4.4 Class I Work Procedures

In addition to requirements of paragraphs Mandated Practices and Control Methods, the following engineering controls and work practices shall be used:

a. A Competent Person shall supervise the installation and operation of the control system.

b. Where a negative exposure assessment has not been provided or where exposure monitoring shows the PEL was exceeded, the regulated area shall be ventilated to move contaminated air away from the employee's breathing zone toward a HEPA unit or collection device.

3.4.5 Specific Control Methods for Class I Work

In addition to requirements of paragraph Class I Work Procedures, Class I asbestos work shall be performed using the control methods identified in the subparagraphs below.

3.4.5.1 Negative Pressure Enclosure (NPE) System

The NPE system shall provide at least 4 air changes per hour inside the containment. The local exhaust unit equipment shall be operated 24 hours per day until the containment is removed, and shall be leak-proof to the filter and equipped with HEPA filters. Air movement shall be directed away from the employees and toward a HEPA filtration device. The NPE shall be smoke tested for leaks at the beginning of each shift. Local exhaust equipment shall be sufficient to maintain a minimum pressure differential of minus 0.02 inch of water column relative to adjacent, unsealed areas. Pressure differential shall be monitored continuously, 24 hours per day, with an automatic manometric recording instrument. Pressure differential recordings shall be provided daily on the same day collected. Readings shall be reviewed by the Contractor's Designated Competent Person and IH prior to submittal. The Contracting Officer shall be notified immediately if the pressure differential falls below the prescribed minimum. The building ventilation system shall not be used as the local exhaust system for the regulated area. The local exhaust system shall terminate outdoors unless an alternate arrangement is allowed by the Contract Officer. All filters used shall be new at the beginning of the project and shall be periodically changed as necessary and disposed of as ACM waste.

3.4.5.2 Glovebag Systems

The glovebag system shall be used to remove ACM from straight runs of piping and elbows and other connections. Glovebags shall be used without modification and shall be smoke-tested for leaks and any leaks sealed prior to use. Glovebags shall be installed to completely cover

the circumference of pipe or other structures where the work is to be done. Glovebags shall be used only once and shall not be moved. Glovebags shall not be used on surfaces that have temperatures exceeding 150 degrees F. Prior to disposal, glovebags shall be collapsed by removing air within them using a HEPA vacuum. Before beginning the operation, loose and friable material adjacent to the glovebag operation shall be wrapped and sealed in 2 layers of plastic or otherwise rendered intact. At least 2 persons shall perform Class I glovebag removal. Asbestos regulated work areas shall be established as specified and shown on detailed drawings and plans for glovebag abatement. Designated boundary limits for the asbestos work shall be established with rope or other continuous barriers and all other requirements for asbestos control areas shall be maintained, including area signage and boundary warning tape .

a. In addition to requirements for negative pressure glovebag systems above, the Contractor shall attach HEPA vacuum systems or other devices to the bag to prevent collapse during removal of ACM from straight runs of piping and elbows and other connections.

b. The negative pressure glove boxes used to remove ACM from pipe runs shall be fitted with gloved apertures and a bagging outlet and constructed with rigid sides from metal or other material which can withstand the weight of the ACM and water used during removal. A negative pressure shall be created in the system using a HEPA filtration system. The box shall be smoke tested for leaks prior to each use.

3.4.5.3 Mini-Enclosures

Mini-containment (small walk-in enclosure) to accommodate no more than 2 persons, may be used if the disturbance or removal can be completely contained by the enclosure with the following specifications and work practices. The mini-enclosure shall be inspected for leaks and smoke tested before each use. Air movement shall be directed away from the employee's breathing zone within the mini-enclosure.

3.4.5.4 Wrap and Cut Operation

Prior to cutting pipe, the asbestos-containing insulation shall be wrapped with polyethylene and securely sealed with duct tape to prevent asbestos becoming airborne as a result of the cutting process. The following steps shall be taken: install glovebag, strip back sections to be cut 6 inches from point of cut, and cut pipe into manageable sections.

3.4.6 Cleaning After Asbestos Removal

After completion of all asbestos removal work, surfaces from which ACM has been removed shall be wet wiped or sponged clean, or cleaned by some equivalent method to remove all visible residue. Run-off water shall be collected and filtered through a dual filtration system. A first filter shall be provided to remove fibers 20 micrometers and larger, and a final filter provided that removes fibers 5 micrometers and larger. After the gross amounts of asbestos have been removed from every surface, remaining visible accumulations of asbestos on floors shall be collected using plastic shovels, rubber squeegees, rubber dustpans, and HEPA vacuum cleaners as appropriate to maintain the integrity of the

regulated area. When TSI and surfacing material has been removed, workmen shall use HEPA vacuum cleaners to vacuum every surface. Surfaces or locations which could harbor accumulations or residual asbestos dust shall be checked after vacuuming to verify that no asbestos-containing material remains; and shall be re-vacuumed as necessary to remove the ACM.

3.4.7 Sealing Contaminated Items Designated for Disposal

Contaminated mechanical, and electrical appurtenances such as pipes and fittings, radiators, light fixtures, conduit panels, and other contaminated items designated for removal shall be coated with an asbestos lockdown encapsulant at the demolition site before being removed from the asbestos control area. These items shall be vacuumed prior to application of the lockdown encapsulant. The asbestos lockdown encapsulant shall be tinted a contrasting color and shall be spray applied by airless method. Thoroughness of sealing operation shall be visually gauged by the extent of colored coating on exposed surfaces.

3.5 FINAL CLEANING AND VISUAL INSPECTION

Upon completion of abatement, the regulated area shall be cleaned by collecting, packing, and storing all gross contamination A final cleaning shall be performed using HEPA vacuum and wet cleaning of all exposed surfaces and objects in the regulated area.Upon completion of the cleaning, the Contractor shall conduct a visual pre-inspection of the cleaned area in preparation for a final inspection. Upon completion of the final cleaning, the Contractor and the Contracting Officer shall conduct a final visual inspection of the cleaned regulated area in accordance with ASTM E 1368 and document the results . If the Contracting Officer rejects the clean regulated area as not meeting final cleaning requirements, the Contractor shall reclean as necessary and have a follow-on inspection conducted with the Contracting Officer. Recleaning and follow-up reinspection shall be at the Contractor's expense.

3.6 LOCKDOWN

Prior to removal of plastic barriers and after clean-up of gross contamination and final visual inspection, a post removal (lockdown) encapsulant shall be spray applied to ceiling, walls, floors, and other surfaces in the regulated area.

3.7 EXPOSURE ASSESSMENT AND AIR MONITORING

3.7.1 General Requirements For Exposure Monitoring

Exposure assessment, air monitoring and analysis of airborne concentration of asbestos fibers shall be performed in accordance with 29 CFR 1926,
Section .1101, the Contractor's air monitoring plan, and as specified. Personal exposure air monitoring (collected at the breathing zone) that is
representative of the exposure of each employee who is assigned to work within a regulated area shall be performed by the Contractor's Designated IH. Breathing zone samples shall be taken for at least 25 percent of the workers in each shift, or a minimum of 2, whichever is greater. Air monitoring results at the 95 percent confidence level shall be calculated as shown in Table 1 at the end of this section. The Contractor shall

provide an onsite independent testing laboratory with qualified analysts and appropriate equipment to conduct sample analyses of air samples using the methods prescribed in 29 CFR 1926, Section .1101, to include NIOSH 84-100 Method 7400. Preabatement and abatement environmental air monitoring shall be performed by the Contractor's Designated IH. Environmental air monitoring shall be performed using NIOSH 84-100 Method 7400 (PCM) with optional confirmation of results by NIOSH 84-100 Method 7402 (TEM). Evironmental air monitoring shall be conducted at a sufficient velocity and duration to establish the limit of detection of the method used at 0.005 f/cc. Confirmation of asbestos fiber concentrations (asbestos f/cc) from environmental samples collected and analyzed by NIOSH 84-100 Method 7400 (total f/cc) may be conducted using TEM in accordance with NIOSH 84-100 Method 7402. When such confirmation is conducted, it shall be from the same sample filter used for the NIOSH 84-100 Method 7400 PCM analysis. For all Contractor required environmental air monitoring, confirmation of asbestos fiber concentrations, using NIOSH 84-100 Method 7402, shall be at the Contractor's expense. Monitoring may be duplicated by the Government at the discretion of the Contracting Officer. Results of breathing zone samples shall be posted at the job site and made available to the Contracting Officer. The Contractor shall maintain a fiber concentration inside a regulated area less than or equal to 0.1 f/cc expressed as an 8 hour, time-weighted average (TWA) during the conduct of the asbestos abatement. If fiber concentration rises above 0.1 f/cc, work procedures shall be investigated with the Contracting Officer to determine the cause. At the discretion of the Contracting Officer, fiber concentration may exceed 0.1 f/cc but shall not exceed 1.0 f/cc expressed as an 8-hour TWA. The Contractor's workers shall not be exposed to an airborne fiber concentration in excess of 1.0 f/cc, as averaged over a sampling period of 30 minutes. Should either an environmental concentration of 1.0 f/cc expressed as an 8-hour TWA or a personal excursion concentration of 1.0 f/cc expressed as a 30-minute sample occur inside a regulated work area, the Contractor shall stop work immediately, notify the Contracting Officer, and implement additional engineering controls and work practice controls to reduce airborne fiber levels below prescribed limits in the work area. Work shall not restart until authorized by the Contracting Officer.

3.7.2 Initial Exposure Assessment

The Contractor's Designated IH shall conduct an exposure assessment immediately before or at the initiation of an asbestos abatement operation to ascertain expected exposures during that operation. The assessment shall be completed in time to comply with the requirements which are triggered by exposure data or the lack of a negative exposure assessment, and to provide information necessary to assure that all control systems planned are appropriate for that operation. The assessment shall take into consideration both the monitoring results and all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of the operations of the Contractor which indicate the levels of airborne asbestos likely to be encountered on the job. For Class I asbestos work, until the employer conducts exposure monitoring and documents that employees on that job will not be exposed in excess

of PELs, or otherwise makes a negative exposure assessment, the Contractor shall presume that employees are exposed in excess of the PEL-TWA and PEL-Excursion Limit.

3.7.3 Preabatement Environmental Air Monitoring

Preabatement environmental air monitoring shall be established 1 day prior to the masking and sealing operations for each regulated area to determine background concentrations before abatement work begins. As a minimum, preabatement air samples shall be collected using NIOSH 84-100 Method 7400, PCM at these locations: outside the building; inside the building, but outside the regulated area perimeter; and inside each regulated work area. One sample shall be collected for every 2000 square feet of floor space. At least 2 samples shall be collected outside the utilidors: at the exhaust of the HEPA unit; and downwind from the abatement site. The PCM samples shall be analyzed within 24 hours; and if any result in fiber concentration greater than 0.01 f/cc, asbestos fiber concentration shall be confirmed using NIOSH 84-100 Method 7402 (TEM).

3.7.4 Environmental Air Monitoring During Abatement

Until an exposure assessment is provided to the Contracting Officer, environmental air monitoring shall be conducted at locations and frequencies that will accurately characterize any evolving airborne asbestos fiber concentrations. The assessment shall demonstrate that the product or material containing asbestos minerals, or the abatement involving such product or material, cannot release airborne asbestos fibers in concentrations exceeding 0.01 f/cc as a TWA under those work conditions having the greatest potential for releasing asbestos. The monitoring shall be at least once per shift at locations including, but not limited to, close to the work inside a regulated area; preabatement sampling locations; outside entrances to a regulated area; close to glovebag operations; representative locations outside of the perimeter of a regulated area; inside clean room; and at the exhaust discharge point of local exhaust system ducted to the outside of a containment (if used). If the sampling outside regulated area shows airborne fiber levels have exceeded background or 0.01 f/cc, whichever is greater, work shall be stopped immediately, and the Contracting Officer notified. The condition causing the increase shall be corrected. Work shall not restart until authorized by the Contracting Officer.

3.7.5 Air-Monitoring Results and Documentation

Air sample fiber counting shall be completed and results provided within 24 hours (breathing zone samples), and 48 hours (environmental monitoring) after completion of a sampling period. The Contracting Officer shall be notified immediately of any airborne levels of asbestos fibers in excess of established requirements. Written sampling results shall be provided within 5 working days of the date of collection. The written results shall be signed by testing laboratory analyst, testing laboratory principal and the Contractor's Designated IH. The air sampling results shall be documented on a Contractor's daily air monitoring log. The daily air monitoring log shall contain the following information for each sample:

a. Sampling and analytical method used;

b. Date sample collected;

c. Sample number;

d. Sample type: BZ = Breathing Zone (Personal), P = Preabatement, E = Environmental;

e. Location/activity/name where sample collected;

f. Sampling pump manufacturer, model and serial number, beginning flow rate, end flow rate, average flow rate (L/min);

g. Calibration date, time, method, location, name of calibrator, signature;

h. Sample period (start time, stop time, elapsed time (minutes);

i. Total air volume sampled (liters);

j. Laboratory name, location, analytical method, analyst, confidence level. In addition, the printed name and a signature and date block for the Industrial Hygienist who conducted the sampling and for the Industrial Hygienist who reviewed the daily air monitoring log verifying the accuracy of the information.

3.8 CLEARANCE CERTIFICATION

When asbestos abatement is complete, ACM waste is removed from the regulated areas, and final clean-up is completed, the Contracting Officer will certify the areas as safe before allowing the warning signs and boundary warning tape to be removed. After final clean-up, but before the HEPA unit is turned off and the containment removed, the Contractor shall remove all pre-filters on the building HVAC system and provide new pre-filters. The Contractor shall dispose of such filters as asbestos contaminated materials. HVAC, mechanical, and electrical systems shall be re-established in proper working order. The Contractor and the Contracting Officer shall visually inspect all surfaces within the containment for residual material or accumulated debris. The Contractor shall reclean all areas showing dust or residual materials. The Contracting Officer will certify in writing that the area is safe before unrestricted entry is permitted. The Government will have the option to perform monitoring to certify the areas are safe before entry is permitted.

3.9 CLEANUP AND DISPOSAL

3.9.1 Title to ACM Materials

ACM material resulting from abatement work, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified and in accordance with applicable federal, state and local regulations and policies.

3.9.2 Collection and Disposal of Asbestos

All ACM waste, including contaminated wastewater filters, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing shall be collected and placed in leak-tight containers such as double plastic bags sealed double wrapped polyethylene sheet; sealed fiberboard boxes; or other approved containers. Waste within the containers shall be

wetted in case the container is breeched. Asbestos-containing waste shall be disposed of at the Ft. Wainwright landfill. For temporary storage, sealed impermeable containers shall be stored in an asbestos waste load-out unit or in a storage/transportation conveyance (i.e., dumpster, roll-off waste boxes, etc.) in a manner acceptable to and in an area assigned by the Contracting Officer. Procedure for hauling and disposal shall comply with 40 CFR 61, Subpart M, state, regional, and local standards.

3.9.3 Scale Weight Measurement

If used or required by the landfill, scales used for measurement shall be public scales. Weighing shall be at a point nearest the work at which a public scale is available. Scales shall be standard truck scales of the beam type; scales shall be equipped with the type registering beam and an "over and under" indicator; and shall be capable of accommodating the entire vehicle. Scales shall be tested, approved and sealed by an inspector of the State of Alaska. Scales shall be calibrated and resealed as often as necessary and at least once every three months to ensure continuous accuracy. Vehicles used for hauling ACM shall be weighed empty daily at such time as directed and each vehicle shall bear a plainly legible identification mark.

3.9.4 Weigh Bill and Delivery Tickets

If used or required by the landfill, copies of weigh bills and delivery tickets shall be submitted to the Contracting Officer during the progress of the work. The Contractor shall furnish the Contracting Officer scale tickets for each load of ACM weighed and certified. These tickets shall include tare weight; identification mark for each vehicle weighed; and date, time and location of loading and unloading. Tickets shall be furnished at the point and time individual trucks arrive at the worksite. A master log of all vehicle loading shall be furnished for each day of loading operations. Before the final statement is allowed, the Contractor shall file with the Contracting Officer certified weigh bills and/or certified tickets and manifests of all ACM actually disposed by the Contractor for this contract.

3.9.5 Asbestos Waste Shipment Record

The Contractor shall complete and provide the Contracting Officer final completed copies of the Waste Shipment Record for all shipments of waste material as specified in 40 CFR 61, Subpart M and other required state waste manifest shipment records, within 3 days of delivery to the landfill.
Each Waste Shipment Record shall be signed and dated by the Contractor, the waste transporter and disposal facility operator.

TABLE 1

FORMULA FOR CALCULATION OF THE 95 PERCENT CONFIDENCE LEVEL
(Reference: NIOSH 7400)

Fibers/cc(01.95 percent CL) = X + (X) * (1.645) * (CV)

Where: X = ((E)(AC))/((V)(1000))

E = ((F/Nf) - (B/Nb))/Af

CV = The precision value; 0.45 shall be used unless the analytical laboratory provides the Contracting Officer with documentation (Round Robin Program participation and results) that the laboratory's precision is better.

AC = Effective collection area of the filter in square millimeters

V = Air volume sampled in liters

E = Fiber density on the filter in fibers per square millimeter

F/Nf = Total fiber count per graticule field

B/Nb = Mean field blank count per graticule field

Af = Graticule field area in square millimeters

TWA = C1/T1 + C2/T2 = Cn/Tn

Where: C = Concentration of contaminant

T = Time sampled.

TABLE 2

NI0SH METHOD 7400

PCM ENVIRONMENTAL AIR SAMPLING PROTOCOL (NON-PERSONAL)

Sample Location	Minimum No. of Samples	Filter Pore Size (Note 1)	Min. Vol. (Note 2) (Liters)	Sampling Rate (liters/min.)
Inside Abatement Area	0.5/140 Square Meters (Notes 3 & 4)	0.45 microns	3850	2-16
Each Room in 1 Abatement Area Less than 140 Square meters		0.45 microns	3850	2-16
Field Blank	2	0.45 microns	0	0
Laboratory Blank	1	0.45 microns	0	0

Notes:

1. Type of filter is Mixed Cellulose Ester.

2. Ensure detection limit for PCM analysis is established at 0.005 fibers/cc.

3. One sample shall be added for each additional 140 square meters. (The corresponding I-P units are 5/1500 square feet).

4. A minimum of 5 samples are to be taken per abatement area, plus 2 field blanks.

TABLE 3

EPA AHERA METHOD: TEM AIR SAMPLING PROTOCOL

Location Sampled	Minimum No. of Samples	Filter Pore Size	Min. Vol. (Liters)	Sampling Rate (liters/min.)
Inside Abatement Area	5	0.45 microns	1500	2-16
Outside Abatement Area	5	0.45 microns	1500	2-16
Field Blank	2	0.45 microns	0	0
Laboratory Blank	1	0.45 microns	0	0

Notes:

1. Type of filter is Mixed Cellulose Ester.

2. The detection limit for TEM analysis is 70 structures/square mm.

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME _____ CONTRACT NO. _____
PROJECT ADDRESS _____
CONTRACTOR FIRM NAME _____
EMPLOYEE'S NAME _____,_____,_____,
(Print) (Last) (First) (MI)

Social Security Number: _____-_____-_____,

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH TYPES OF LUNG DISEASE AND CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NONSMOKING PUBLIC.

Your employer's contract for the above project requires that you be provided and you complete formal asbestos training specific to the type of work you will perform and project specific training; that you be supplied with proper personal protective equipment including a respirator, that you be trained in its use; and that you receive a medical examination to evaluate your physical capacity to perform your assigned work tasks, under the environmental conditions expected, while wearing the required personal protective equipment. These things are to be done at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you. The Contractor's Designated Industrial Hygienist will check the block(s) for the type of formal training you have completed. Review the checked blocks prior to signing this certification.

FORMAL TRAINING:
_____ a. For Competent Persons and Supervisors: I have completed EPA's Model Accreditation Program (MAP) training course, "Contractor/Supervisor", that meets this State's requirements.

b. For Workers:
_____ (1) For OSHA Class I work: I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
_____ (2) For OSHA Class II work (where there will be abatement of more than one type of Class II materials, i.e., roofing, siding, floor tile, etc.): I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
(3) For OSHA Class II work (there will only be abatement of one type of Class II material):
(a) I have completed an 8-hour training class on the elements of 29 CFR 1926, Section .1101(k)(9)(viii), in addition to the specific work practices and engineering controls of 29 CFR 1926, Section .1101(g) and hands-on training.
_____ (b) I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
_____ (4) For OSHA Class III work: I have completed at least a 16-hour course consistent with EPA requirements for training of local education agency maintenance and custodial staff at 40 CFR 763, Section .92(a)(2) and the elements of 29 CFR 1926, Section .1101(k)(9)(viii), in addition to the specific work practices and engineering controls at 29 CFR 1926,

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

Section .1101, and hands-on training.

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

_____ (5) For OSHA Class IV work: I have completed at least a 2-hr course consistent with EPA requirements for training of local education agency maintenance and custodial staff at 40 CFR 763, (a)(1), and the elements of 29 CFR 1926, Section .1101(k)(9)(viii), in addition to the specific work practices and engineering controls at 29 CFR 1926, Section .1101(g) and hands-on training.

_____ c. Workers, Supervisors and the Designated Competent Person: I have completed annual refresher training as required by EPA's MAP that meets this State's requirements.

PROJECT SPECIFIC TRAINING:
_____ I have been provided and have completed the project specific training required by this Contract. My employer's Designated Industrial Hygienist and Designated Competent Person conducted the training.

RESPIRATORY PROTECTION:
_____ I have been trained in accordance with the criteria in the Contractor's Respiratory Protection program. I have been trained in the dangers of handling and breathing asbestos dust and in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair and contact lens use policy of my employer.

RESPIRATOR FIT-TEST TRAINING:
_____ I have been trained in the proper selection, fit, use, care, cleaning,maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in the Contractor's Respiratory Program and have received a satisfactory fit. I have been assigned my individual respirator. I have been taught how to properly perform positive and negative pressure fit-check upon donning negative pressure respirators each time.

MEDICAL EXAMINATION:
_____ I have had a medical examination within the last twelve months which was paid for by my employer. The examination included: health history, pulmonary function tests, and may have included an evaluation of a chest x-ray. A physician made a determination regarding my physical capacity to perform work tasks on the project while wearing personal protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. My employer's Industrial Hygienist evaluated the medical certification provided by the physician and checked the appropriate blank below. The physician determined that there:

_____ were no limitations to performing the required work tasks.
_____ were identified physical limitations to performing the required work tasks.

Date of the medical examination _____

Employee Signature _____ date _____
Contractor's Industrial
Hygienist Signature _____ date _____

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 13 - SPECIAL CONSTRUCTION

SECTION 13281

LEAD HAZARD CONTROL ACTIVITIES

PART 1 GENERAL

1.1 REFERENCES
1.2 DEFINITIONS
1.3 DESCRIPTION OF WORK
1.3.1 Protection of Existing Areas To Remain
1.3.2 Coordination with Other Work
1.4 SUBMITTALS
1.5 QUALIFICATIONS
1.5.1 Qualifications and Organization Report
1.5.2 Personnel and Subcontractor Responsibilities and Qualifications
1.5.2.1 Qualified Safety and Health Professional (QSHP)
1.5.2.2 Lead Hazard Control Workers
1.5.2.3 Testing Laboratories
1.5.2.4 Blood Lead Testing
1.5.2.5 Disposal Facility and Transporter
1.6 REGULATORY REQUIREMENTS
1.7 ACCIDENT PREVENTION PLAN (APP)
1.7.1 APP Content and Organization
1.7.1.1 Lead Hazard Control Plan Appendix
1.7.1.2 Activity Hazard Analyses Appendix
1.7.1.3 Clearance Plan Appendix
1.8 PRE-CONSTRUCTION SAFETY CONFERENCE
1.8.1 Conference General Requirements
1.8.2 Preparatory Inspection Meeting
1.9 MEDICAL SURVEILLANCE REQUIREMENTS
1.10 RESPIRATORY PROTECTION PROGRAM
1.11 LICENCES, PERMITS AND NOTIFICATIONS
1.12 TRAINING
1.12.1 OSHA Training Requirements
1.12.2 Qualified Safety and Health Professional
1.12.3 Abatement Worker
1.13 SAMPLING AND ANALYSIS
1.13.1 Sampling and Analytical Procedures
1.13.1.1 Sampling and Analysis Methods
1.13.1.2 Paint Chip Sampling and Analysis
1.13.1.3 Dust Wipe Materials, Sampling and Analysis
1.13.2 Occupational Exposure Assessment
1.13.3 Lead Hazard Control Area/Containment Monitoring
1.13.4 Waste Disposal Sampling
1.13.5 Analytical Results
1.14 CLEARANCE REQUIREMENTS
1.15 PERSONAL PROTECTIVE EQUIPMENT (PPE)
1.16 HYGIENE FACILITIES
1.17 POSTED WARNINGS AND NOTICES
1.17.1 Regulations
1.17.2 Warning Signs and Labels

1.17.2.1 Warning Signs
1.17.2.2 Warning Labels
1.17.3 Worker Information
1.17.4 Air Monitoring Results
1.17.5 Emergency Telephone Numbers
1.18 MATERIALS AND EQUIPMENT
1.18.1 Abrasive Removal Equipment
1.18.2 Vacuum Systems
1.18.3 Heat Blower Guns
1.18.4 Chemical Paint Strippers
1.18.5 Chemical Paint Stripper Neutralizer
1.18.6 Detergents and Cleaners
1.19 EXPENDABLE SUPPLIES
1.19.1 Polyethylene Bags
1.19.2 Polyethylene Leak-tight Wrapping
1.19.3 Polyethylene Sheeting
1.19.4 Tape and Adhesive Spray
1.19.5 Containers
1.19.6 Chemicals
1.20 STORAGE OF MATERIALS

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 WORK PROCEDURES
3.1.1 Lead Hazard Control Areas, Equipment and Procedures
3.1.2 Lead Hazard Control Areas
3.2 USE OF HYGIENE FACILITIES
3.3 WASTE DISPOSAL PROCEDURES
3.3.1 Construction Debris and/or Sanitary Landfill Waste
3.3.2 Waste Stream Classification
3.3.3 Hazardous Waste Transportation and Disposal
3.4 LEAD HAZARD CONTROL PROCEDURES, METHODS AND TECHNIQUES.
3.4.1 Paint Removal Methods
3.4.1.1 Low Temperature Heat Gun
3.4.1.2 HEPA Sanding
3.4.1.3 Wet Scraping
3.4.1.4 HEPA Vacuum Blasting
3.4.1.5 HEPA Vacuum Needle Gun
3.5 CLEARANCE PROCEDURES
3.5.1 Visual Inspection
3.6 EVALUATION OF SAMPLING AND MONITORING RESULTS
3.6.1 Occupational Safety and Health
3.6.2 Control Efficiency of Containment Features
3.6.3 Removal of Lead Hazard Control Area
3.7 CLEARANCE REPORT
3.8 TITLE TO MATERIALS
3.9 PAYMENT FOR HAZARDOUS WASTE
3.10 CERTIFICATION OF VISUAL INSPECTION

-- End of Section Table of Contents --

SECTION 13281

LEAD HAZARD CONTROL ACTIVITIES

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

STATE OF ALASKA ADMINISTRATIVE CODE (AAC)

8 AAC 61	(2003) Occupational Safety and Health Standards
18 AAC 60	(2003) Solid Waste Management

ASTM INTERNATIONAL (ASTM)

ASTM E 1553	(1993) Practice for Collection of Airborne Particulate Lead During Abatement and Construction Activities
ASTM E 1613	(1999) Standard Test Method for Determination of Lead by Inductivety Coupled Plasma Atomic Emission Spectrometry (ICP-AES), Flame Atomic Absorption Spectrometry (FAAS), or Graphite Furnace Atomic Absortion (GFAAS) Techniques
ASTM E 1729	(1999) Field Collection of Dried Paint Samples for Lead Determination by Atomic Spectrometry Techniques
ASTM E 1741	(2000) Preparaton of Airborne Particulate Lead Samples Collected During Abatement and Construction Activities for Subsequent Analysis by Atomic Spectrometry
ASTM E 1792	(1996a) Wipe Sampling Materials for Lead in Surface Dust

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 701	(1999) Methods of Fire Tests for Flame-Resistant Textiles and Films

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH 84-100	(1984; Supple 1985, 1987, 1988 & 1990) NIOSH Manual of Analytical Methods

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2003) Safety and Health Requirements Manual

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

HUD 6780	(1995; Errata Aug 1996;Rev Ch. 7 - 1997) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

24 CFR 35	Lead-Based Paint Poisioning Prevention in Certain Residential Structures
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 745	Lead-Based Paint Poisoning Prevention in Certain Residential Structures

1.2 DEFINITIONS

a. Lead Hazard Control Activity - Any construction work where a worker may be occupationally exposed to lead and procedures have to be followed to assure that: 1). Lead inside the lead hazard control area is cleaned up to appropriate levels and 2). Lead dust does not disperse outside the lead hazard control area at unacceptable levels.

b. Public/Commercial Building - Buildings on real property, including residential real property, generally accessible to the public except target housing, child occupied facilities and industrial buildings. Examples include offices, stores/shopping centers, churches, schools, barracks, hospitals, museums, airports, hotels, convention centers.

c. Industrial Building - Any building used for industrial purposes where normal operations inside the building may produce lead aerosol that will settle out on inside surfaces.

d. Target Housing - Residential real property which is housing constructed prior to 1978, except housing for the elderly or persons with disabilities (unless any one or more children age 6 years or under resides or is expected to reside in such housing for the elderly or persons with disabilities) or any 0 bedroom dwelling.

e. Child-occupied Facility - Real property which is a building or portion of a building constructed prior to 1978 visited regularly by the same child, 6 years of age or under, on at least two different days, provided that each day's visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Child-occupied facilities include but are not limited to, day-care centers, preschools and kindergarten classrooms.

f. Residential Real Property - Real property on which there is situated one or more residential dwellings used or occupied, or intended to be used or occupied , in whole or in part, as the home or residence of one or more persons.

1.3 DESCRIPTION OF WORK

The work covered by this section includes all work that disturbs lead-containing materials and compontents. Lead-containing materials that will not be disturbed by demolition, disposal and construction activities, do not need to be abated. All painted items are assumed to be coated with lead based paint. The main sections of the utilidor contain a lead-clad communications cable.

1.3.1 Protection of Existing Areas To Remain

All project work including, but not limited to, lead hazard work, storage, transportation, and disposal shall be performed without damaging or contaminating adjacent work and areas. Where such work or areas are damaged or contaminated, the Contractor shall restore work and areas to the original condition at no additional cost to the Government.

1.3.2 Coordination with Other Work

The contractor shall coordinate lead hazard control activities with work being performed in adjacent areas. Coordination procedures shall be explained in the Contractor's Accident Prevention Plan and shall describe how the Contractor will prevent lead exposure to other contractors and/or Government personnel performing work unrelated to lead hazard control activities.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Materials and Equipment;
Expendable Supplies;

A description of the materials, equipment and expendable supplies required; including Material Safety Data Sheets (MSDSs) for material brought onsite to perform the work.

Qualifications; G, EN-ES-M

A report providing evidence of qualifications and designating responsibilities for personnel and laboratories.

SD-06 Test Reports

Pressure Differential Log;
Licences, Permits, and Notifications; G, EN-ES-M
Accident Prevention Plan (APP); G, EN-ES-M

A report describing how the Contractor will protect workers, building occupants, and building contents while performing lead hazard control activities; and how project clearance will be performed.

Sampling and Analysis; G, EN-ES-M

A log of the analytical results required for the sampling. The log shall be kept current.

Clearance Report; G, EN-ES-M

Report prepared by the QSHP.

1.5 QUALIFICATIONS

1.5.1 Qualifications and Organization Report

The Contractor shall furnish a qualification and organization report. The report shall describe the qualifications of the qualified safety and health professional (QSHP), onsite safety and health supervisor (OSHS) and labor staff. The report shall include an organization chart showing the Contractor's personnel by name and title and project specific responsibilities and authorities. The report shall describe the qualifications of the laboratories selected for this project. The report shall be signed by the Contractor and the qualified safety and health professional to indicate that all personnel and laboratories comply with certification and experience requirements of this section and that project personnel have been given the authority to complete the tasks assigned to them.

1.5.2 Personnel and Subcontractor Responsibilities and Qualifications

1.5.2.1 Qualified Safety and Health Professional (QSHP)

The QSHP shall be responsible for development of project specific requirements in the Accident Prevention Plan (APP); supervise implementation of the APP requirements; visit the site as needed to verify effectiveness of the APP and to coordinate resolution of unknown situations that may develop as the work progresses; be available to provide consultation to the Onsite Safety and Health Supervisor (OSHS); review sampling and analytical results to evaluate occupational exposure levels, verify effectiveness of controls and determine if clearance requirements have been met. The QSHP shall have demonstrable experience with the implementation of occupational safety and health regulations.

1.5.2.2 Lead Hazard Control Workers

Lead Hazard Control workers shall be responsible for performing the labor necessary to complete the lead hazard control activities required in this contract.

1.5.2.3 Testing Laboratories

The laboratory selected to perform analysis on paint chip, soil or dust wipe samples shall be accredited by EPA's National Lead Laboratory Accreditation Program (NLLAP). The laboratory selected perform analysis on worker exposure (industrial hygiene) samples shall be in the American Industrial Hygiene Association's Industrial Hygiene Laboratory

Accreditation Program (IHLAP) and shall be successfully participating in the Proficiency Analytical Testing (PAT) program for lead.

1.5.2.4 Blood Lead Testing

The laboratory selected to perform analysis on worker blood samples shall be approved by OSHA and meet the requirements contained in NLLAP.
.

1.5.2.5 Disposal Facility and Transporter

The Contractor shall furnish written evidence that the landfill to be used is approved for lead disposal by USEPA and state and local requirements. Copies of any required signed agreements between the Contractor (including subcontractors and transporters) and the lead disposal facility shall be provided.

1.6 REGULATORY REQUIREMENTS

In addition to the detailed requirements of this specification, work shall be performed in accordance with requirements of EM 385-1-1 and applicable regulations including, but not limited to 29 CFR 1910, 29 CFR 1926, especially Section .62, 8 AAC 61, 18 AAC 60 and the accepted Accident Prevention Plan with Appendices. Matters of interpretation of the standards shall be resolved to the satisfaction of and with the concurrence of, the Contracting Officer before starting work. Where these requirements vary, the most stringent shall apply.

1.7 ACCIDENT PREVENTION PLAN (APP)

1.7.1 APP Content and Organization

The Contractor's Accident Prevention Plan shall be consist of the overall plan and appendices. The overall plan shall address each element in Appendix A of EM 385-1-1 in project specific detail. The elements are: a. Signature Sheet, b. Background Information, c. Statement of Safety and Health Policy, d. Responsibilities and Lines of Authorities, e. Subcontractors and Suppliers, f. Training, g. Safety and Health Inspections, h. Safety and Health Expectations, Incentive Programs and Compliance, i. Accident Reporting, j. Medical Support, k. Corporate Plans and Programs required by this contract, (HAZCOM, Respiratory Protection).

1.7.1.1 Lead Hazard Control Plan Appendix

The Lead Hazard Control Appendix shall address occupational exposure issues and shall describe the procedures to be followed to protect employees from lead hazards while performing lead hazard control activities. Each of the following elements shall be addressed in the lead hazard control appendix:

a. The location and a brief description of each work activity that will emit lead into the workplace atmosphere. A description of any components containing lead shall be included and keyed to the project drawings.

b. Description of equipment and materials, controls, crew size, worker responsibilities, and operating and maintenance procedures.

c. Description and sketch of the Lead Hazard Control Areas, including decontamination areas.

d. Description of the specific lead control methods and procedures to protect workers and other onsite contractors from lead exposure.

e. Technologic equipment used to keep occupational exposure below the Permissible Exposure Limit and minimize worker exposure to lead (i.e., HEPA-filtered vacuum equipment/cleaners, special negative air enclosure equipment and supplies, etc.).

f. Worker Exposure Assessment including methods and procedures to monitor and document worker exposure to lead. Worker exposure monitoring shall be broken into two parts in the plan. Part A: Initial Determination. The Contractor shall describe worker monitoring (if performed for the "initial determination" described in 29 CFR 1926 (.62) (d). Monitoring for the initial determination may be omitted from the plan if the Contractor has sufficient proof from previous operations as specified in 29 CFR 1926 (.62) (d)(3)(iii) and (iv) that workers will not be exposed over the action level. The Contractor shall substitute objective proof of action level compliance in Part A if "initial determination" monitoring is omitted. Part B: Continued Exposure Monitoring. Worker exposure monitoring after the initial lead exposure determination has been made.

g. Work Practices Program describing the protective clothing to be used to protect workers from lead exposure, house keeping procedures employed to minimize spread on lead contamination in the lead hazard control area, hygiene facilities and practices used to prevent workers from inadvertent ingestion of lead.

h. Administrative Control Procedures, to be used as a last resort, to limit worker exposure to lead. The worker rotation schedule to be employed, should engineering or personal protective equipment precautions fail to be effective, shall be described. This element of the plan shall be omitted if administrative controls will not be used.

i. Medical Surveillance practices and procedures used to monitor worker exposure to lead and to assure fitness for wearing respiratory protection devices.

j. Worker training meeting the requirements of 29 CFR 1926 Sections (.62) and (.59) to assure workers understand hazard associated with working with lead and how to protect themselves.

k. Security: A log book shall be kept documenting entry into and out of the lead hazard control area. Entry into lead hazard control areas shall only be by personnel authorized by the Contractor and the Contracting Officer. Persons entering control areas shall be trained, medically evaluated, and equipped with personal protective equipment required for the specific control area to be entered.

1.7.1.2 Activity Hazard Analyses Appendix

An Activity Hazard Analysis (AHA) shall be prepared for each work task data element specified on the individual work task data element sheets at the end of this section. The AHA shall be submitted to the Contracting Officer prior to beginning specified work. Format shall be in accordance with EM 385-1-1, Figure 1-1. The AHA shall be continuously reviewed and modified, when appropriate, to address changing conditions or operations. Each accepted AHA shall be appended to and become part of the APP.

1.7.1.3 Clearance Plan Appendix

The Contractor shall develop a Clearance Plan describing practices and procedures used to assure that lead hazard control activities are complete and that lead contamination within the lead hazard control area comply with visual clearance criteria.

1.8 PRE-CONSTRUCTION SAFETY CONFERENCE

1.8.1 Conference General Requirements

The Contractor and the QSHP shall attend a pre-construction safety conference prior to starting work. Items required to be submitted shall be reviewed for completeness, and where specified, for acceptance. Details of the APP shall be revised to correct any deficiencies, and resubmitted for acceptance. Onsite work shall not begin until the APP has been accepted, unless otherwise authorized by the Contracting Officer. One copy of the APP shall be maintained in the Contractor's jobsite file, and a second copy shall be posted where it will be accessible to personnel on the site. As work proceeds, the APP shall be adapted to new situations and conditions. Changes to the APP shall be made by the QSHP with acceptance by the Contracting Officer. Should an unforeseen hazard become evident during performance of the work, the QSHP shall inform the Contracting Officer, both verbally and in writing, for immediate resolution. In the interim, the QSHP shall take necessary action to re-establish and maintain safe working conditions; and to safeguard onsite personnel, visitors, the public, and the environment. Disregard for provisions of this specification, or the accepted APP, shall be cause for stopping of work until the matter is rectified.

1.8.2 Preparatory Inspection Meeting

The Contractor shall arrange and hold a preparatory inspection meeting to review completeness and adequacy of the APP immediately prior to beginning each phase of work.

1.9 MEDICAL SURVEILLANCE REQUIREMENTS

The Contractor shall comply with the following medical surveillance requirements:

a. The Contractor shall make every attempt to keep occupational exposure to lead on this project below the action level of 30 micrograms/cubic meter defined in 29 CFR 1926 (.62). If it is not possible, and if occupational exposures could possibly exceed the action level for 30 or more days per year, the Contractor shall institute a medical surveillance program. The program shall meet the examination frequency and content requirements specified in paragraph (j)(1), (j)(2) and (j)(3) of 29 CFR 1926 (.62). Medical removal as specified in paragraph

(k) of 29 CFR 1926 (.62), if necessary, shall be at the Contractor's expense.

b. Medical surveillance and biological monitoring shall be in compliance with 29 CFR 1926 (.62) (g) and (j). Initial biological monitoring shall be performed on lead hazard control workers prior to assignment to the project. Workers shall not be assigned to the project if results indicate a need for restricted activities.

c. All lead hazard control workers shall pass the medical examinations necessary to be approved by the occupational physician to wear respiratory protection on this project. Occupational physician's approval shall be given prior to assignment to the project.

1.10 RESPIRATORY PROTECTION PROGRAM

The Contractor shall have a written respiratory protection program and shall be fully capable of implementing the requirement of the respiratory protection program on this project. The respiratory protection program shall meet the requirements of 29 CFR 1926 (.62) and 29 CFR 1910 (.134). Project specific respiratory protection requirements shall be included in the lead hazard control plan appendix of the Contractor's accident prevention plan.

1.11 LICENCES, PERMITS AND NOTIFICATIONS

The Contractor shall certify in writing to the Region X Office of the EPA, the Alaska Department of Environmental Conservation and the Contracting Officer at least 10 days prior to the commencement of lead abatement work that licenses, permits and notifications have been obtained. The Contractor is responsible for all associated fees or costs incurred in obtaining the licenses, permits and notifications.

1.12 TRAINING

1.12.1 OSHA Training Requirements

All Contractor personnel and/or subcontractors performing or responsible for onsite oversight of lead hazard control activities shall meet the following training requirements.

a. Content of 29 CFR 1926 (.62) and its appendices.

b. How operations could result in exposure over the action level.

c. Purpose, selection, fitting, use and limitations of respirators.

d. Purpose and description of the medical surveillance program.

e. Use of engineering controls and good work practices to limit occupational exposure to lead.

f. Implementation of the lead hazard control plan appendix of the accident prevention plan.

g. Medical supervision for the use of chelating agents.

h. Employee right of access to medical surveillance records as specified in 29 CFR 1910 (.20).

1.12.2 Qualified Safety and Health Professional

The qualified safety and health professional shall meet the training requirements in paragraph 1.12.1 and shall meet the training, experience and authority requirements in 29 CFR 1926 (.62) to be a competent person.

1.12.3 Abatement Worker

Workers shall meet the OSHA Training Requirements specified above.

1.13 SAMPLING AND ANALYSIS

1.13.1 Sampling and Analytical Procedures

1.13.1.1 Sampling and Analysis Methods

Analysis shall conform to NIOSH 84-100 Method 7082, Lead, for personal sampling required by 29 CFR 1926 (.62) Sampling shall conform to ASTM E 1553 or ASTM E 1741, as appropriate.

1.13.1.2 Paint Chip Sampling and Analysis

Sampling shall conform to ASTM E 1729. Analysis shall conform to ASTM E 1613.

1.13.1.3 Dust Wipe Materials, Sampling and Analysis

Sampling shall conform to ASTM E 1792. Analysis shall conform to ASTM E 1613.

1.13.2 Occupational Exposure Assessment

Sampling and analytical procedures to determine compliance with the occupational exposure monitoring requirement of this section shall be described in the lead hazard control plan appendix of the Contractor's accident prevention plan. Monitoring for the initial determination may be omitted if the Contractor has sufficient proof from previous operations as specified in 29 CFR 1926 (.62) (d)(3)(iii) and (iv) that workers will not be exposed over the action level. The following occupational exposure monitoring requirements apply and shall be implemented if the requirements of 29 CFR 1926 (.62)(d)(3) (iii) and (iv) cannot be demonstrated.

a. During Initial Monitoring the Contractor shall representatively sample employees with the greatest potential for exposure to aerosolized lead.

b. Continued/Additional Monitoring shall meet applicable paragraphs in 29 CFR 1926 (.62)(d)(6), Frequency, after the initial determination has been made.

1.13.3 Lead Hazard Control Area/Containment Monitoring

The Contractor shall perform a visual inspection once per day outside the lead hazard control area to assure visual clearance criteria are maintained while lead hazard control activities are performed. The

Contractor shall clean at its own expense, and to the Contracting Officer's satisfaction, all contaminated surfaces outside the lead hazard control area, if surfaces fail visual clearance criteria.

1.13.4 Waste Disposal Sampling

The Contractor shall sample each segregated waste stream contianing lead for TCLP analysis to determine waste disposal requirements. Segration of wastes shall be described in the lead hazard control plan and be designed to minizize the generation of hazardous wastes.

1.13.5 Analytical Results

The Contractor shall develop and maintain during the course of the project a log of analytical results generated by the above sampling requirements. The log shall clearly describe the reason for which the sample was taken (worker exposure, migration control, clearance) the analytical result for each sample and evaluate if the analytical result passed or failed the action levels. At a minimum, the Contractor shall include analytical results for samples required to be taken in paragraphs Occupational Exposure Assessment and Lead Hazard Control Area/Containment Monitoring.

1.14 CLEARANCE REQUIREMENTS

The Contractor shall describe clearance requirements for this project in the Clearance Plan Appendix of the Accident Prevention Plan. Clearance criterial for lead hazard control areas in industrial facilities shall be by visual clearance criteria.

1.15 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The Contractor shall describe the PPE to be used to protect workers from lead hazards in the Lead Hazard Control Plan Appendix of the Accident Prevention Plan. The Contractor shall furnish, at no cost to the workers, clothing for protection from lead-contaminated dust and debris. An adequate supply of these items shall be available for worker and Government personnel use. Protective clothing shall include:

a. Coveralls: Full-body coveralls shall be provided to lead hazard control workers.

b. Boots: Boots and shoes shall be provided as required by EM 385-1-1 Section 05.A.08 for workers. Boot/shoe covers shall be provided to prevent contamination of boots and shoes.

c. Hand Protection: Gloves, etc., shall be provided as required by EM 385-1-1 Section 05.A.10 for workers.

d. Head Protection: Hard hats shall be provided as required by 29 CFR 1910 (.135) and EM 385-1-1 Section 05.D for workers and authorized visitors.

e. Eye and Face Protection: Eye and face protection shall be provided as required by 29 CFR 1910 (.133) and EM 385-1-1 Section 05.B for workers and authorized visitors.

f. Respirators: NIOSH certified air-purifying respirators or filtering face pieces shall be provided for use as respiratory

protection for airborne lead and for other hazardous airborne contaminants that may be encountered; as determine by the on-site safety and health supervisor. At a minimum, respirators shall be furnished to each employee required to enter a lead hazard control area where an employee exposure assessment has not yet been performed, or where monitoring data establishes the need for respiratory protection, or if requested by the employee.

g. Respirator Cartridges/Filtering Face Pieces: Respirator cartridges shall be changed out/filtering face pieces properly disposed of when the they become sufficiently loaded with particulate matter that workers experience breathing resistance. Cartridges and filtering face pieces shall be N, R or P 100 rated to assure sufficient protection from lead exposure.

1.16 HYGIENE FACILITIES

The Contractor shall describe the personal hygiene facilities to be used by the workers in the Lead Hazard Control Plan Appendix of the Accident Prevention Plan. The Contractor shall provide hygiene facilities for lead hazard control workers. Hygiene facilities shall comply with the requirements in 29 CFR 1926 (.51) (f).

1.17 POSTED WARNINGS AND NOTICES

The following regulations, warnings, and notices shall be posted at the worksite in accordance with 29 CFR 1926 (.62).

1.17.1 Regulations

At least two copies of 29 CFR 1926 (.62) shall be made available for use by either the Contracting Officer or affected workers; and for the purpose of providing required information and training to the workers involved in the project. One copy shall be maintained in the Contractor's jobsite file, and a second copy shall be posted where it will be accessible to workers on the site.

1.17.2 Warning Signs and Labels

Warning signs shall be posted in each lead hazard control area where worker exposure to lead is undetermined or where the exposures are above the permissible exposure limit as defined in 29 CFR 1926 (.62). Signs shall be located to allow personnel to read the signs and take necessary precautions before entering the lead hazard control area.

1.17.2.1 Warning Signs

Warning signs shall be in English, be of sufficient size to be clearly legible, and display the following:

WARNING

LEAD WORK AREA

POISON

NO SMOKING OR EATING

1.17.2.2 Warning Labels

Warning labels shall be affixed to all lead waste disposal containers used to hold materials, debris and other products contaminated with lead hazards; warning labels shall be in English and be of sufficient size to be clearly legible, and display the following:

CAUTION: CLOTHING CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY

BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN

ACCORDANCE WITH APPLICABLE FEDERAL, STATE OR LOCAL REGULATIONS.

1.17.3 Worker Information

Right-to-know notices shall be placed in clearly visible areas accessible to personnel on the site, to comply with Federal, state, and local regulations.

1.17.4 Air Monitoring Results

Air monitoring results shall be prepared so as to be easily understood by the workers(Pressure Differential Log). One copy shall be maintained in the Contractor's jobsite file, and a second copy shall be posted where it will be accessible to the workers as specified in 29 CFR 1926 (.62).

1.17.5 Emergency Telephone Numbers

A list of emergency telephone numbers shall be posted at the site. The list shall include numbers of the local hospital, emergency squad, police and fire departments, Government and Contractor representatives who can be reached 24 hours per day, and professional consultants directly involved in the project.

1.18 MATERIALS AND EQUIPMENT

Sufficient quantities of health and safety materials required by 29 CFR 1926 (.62), and other materials and equipment needed to complete the project, shall be available and kept on the site.

1.18.1 Abrasive Removal Equipment

The use of powered machine for vibrating, sanding, grinding, or abrasive blasting is prohibited unless equipped with local exhaust ventilation systems equipped with high efficiency particulate air (HEPA) filters.

1.18.2 Vacuum Systems

Vacuum systems shall be suitably sized for the project, and filters shall be capable of trapping and retaining all mono-disperse particles as small as 0.3 micrometers at a minimum efficiency of 99.97 percent. Used filters that are being replaced shall be disposed in a proper manner.

1.18.3 Heat Blower Guns

Heat blower guns shall be flameless, electrical, paint-softener type

with controls to limit temperature to 1,100 degrees F. Heat blower shall be DI (non-grounded) 120 volts ac, and shall be equipped with cone, fan, glass protector and spoon reflector nozzles.

1.18.4 Chemical Paint Strippers

Chemical paint strippers shall not contain methylene chloride and shall be formulated to prevent stain, discoloration, or raising of the substrate materials.

1.18.5 Chemical Paint Stripper Neutralizer

Neutralizers for paint strippers shall be compatible with the substrate and suitable for use with the chemical stripper that has been applied to the surface.

1.18.6 Detergents and Cleaners

Detergents or cleaning agents used shall have demonstrated effectiveness in lead control work using cleaning techniques specified by HUD 6780 guidelines.

1.19 EXPENDABLE SUPPLIES

1.19.1 Polyethylene Bags

Disposable bags shall be polyethylene plastic and shall be a minimum of 6 mils thick (4 mils thick if double bags are used) or any other thick plastic material shown to demonstrate at least equivalent performance; and shall be capable of being made leak-tight. Leak-tight means that solids, liquids or dust cannot escape or spill out.

1.19.2 Polyethylene Leak-tight Wrapping

Wrapping used to wrap lead contaminated debris shall be polyethylene plastic that is a minimum of 6 mils thick or any other thick plastic material shown to demonstrate at least equivalent performance.

1.19.3 Polyethylene Sheeting

Sheeting shall be polyethylene plastic with a minimum thickness of 6 mil, or any other thick plastic material shown to demonstrate at least equivalent performance; and shall be provided in the largest sheet size reasonably accommodated by the project to minimize the number of seams. Where the project location constitutes an out of the ordinary potential for fire, or where unusual fire hazards cannot be eliminated, flame-resistant polyethylene sheets which conform to the requirements of NFPA 701 shall be provided.

1.19.4 Tape and Adhesive Spray

Tape and adhesive shall be capable of sealing joints between polyethylene sheets and for attachment of polyethylene sheets to adjacent surfaces. After dry application, tape or adhesive shall retain adhesion when exposed to wet conditions, including amended water. Tape shall be minimum 2 inches wide, industrial strength.

1.19.5 Containers

When used, containers shall be leak-tight and shall be labeled in accordance with EPA, DOT and OSHA standards, as specified in paragraph WARNING LABELS.

1.19.6 Chemicals

Chemicals, including caustics and paint strippers, shall be properly labeled, used in accordance with the manufacturers recommendations and stored in leak-tight containers. Material Safety Data Sheets (MSDSs) shall be provided.

1.20 STORAGE OF MATERIALS

Materials shall be stored protected from damage and contamination. During periods of cold weather, plastic materials shall be protected from the cold. Flammable or hazardous materials shall not be stored inside a building. Materials shall be regularly inspected to identify damaged or deteriorating items. Damaged or deteriorated items shall not be used and shall be removed from the site as soon as they are discovered. Stored materials shall not present a hazard or an inconvenience to workers, visitors, and/or other occupants and employees of the facility in which they are located.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 WORK PROCEDURES

The Contractor shall perform work following practices and procedures described accident prevention plan.

3.1.1 Lead Hazard Control Areas, Equipment and Procedures

The Contractor shall set up lead hazard control areas and operate equipment within the lead hazard control area in a manner that will minimize migration of lead dust beyond the lead hazard control area boundaries and minimize exposure to workers.

3.1.2 Lead Hazard Control Areas

Access into lead hazard control areas by the general public shall be prohibited. Workers entering the lead hazard control area shall meet medical surveillance requirements of this contract and shall be required to understand and follow procedures described in the Contractor's accident prevention plan for reducing lead exposure.

3.2 USE OF HYGIENE FACILITIES

a. Personnel and equipment shall be decontaminated when exiting the lead hazard control area. The Contractor shall comply with the following personnel and equipment decontamination procedures:

    1. HEPA vacuum outer garments and equipment.

    2. Wet Wipe Equipment.

    3. Remover outer layer of garments.

4. Thoroughly wash face and hands, if showering not required.

5. Shower (if applicable).

6. Remove Respirator (if applicable).

7. Exit lead hazard control area.

b. The Contractor shall provide, and workers shall use, a change room to change into work clothing at the beginning of a work shift. At the end of the work shift workers shall change back into street clothing and leave contaminated work clothing at the site for disposal or laundering.

c. The Contractor shall provide an eating facility as free as practical from lead contamination. Workers shall be allowed usage of the eating facility for rest/lunch breaks.

3.3 WASTE DISPOSAL PROCEDURES

3.3.1 Construction Debris and/or Sanitary Landfill Waste

The Contractor shall dispose of the all wastes in one or more properly permitted landfills.

3.3.2 Waste Stream Classification

The Contractor shall determine the RCRA waste classification for all waste streams generated by the lead hazard control project. The Contractor shall perform the sampling and analysis specified in paragraph WASTE DISPOSAL PROCEDURES, evaluate analytical results and propose waste stream treatment and disposal requirements for the contract. The Contracting Officer will approve waste stream treatment and disposal requirements proposed by the Contractor.

3.3.3 Hazardous Waste Transportation and Disposal

The Contractor shall transport, treat and dispose of hazardous waste in accordance with all applicable regulations.

3.4 LEAD HAZARD CONTROL PROCEDURES, METHODS AND TECHNIQUES.

3.4.1 Paint Removal Methods

Prohibited paint removal methods shall include: open flame burning or torching, including the use of heat guns having operating temperatures greater than 1,100 degrees F; machine sanding or grinding without HEPA exhaust; non-contained hydro blasting or high-pressure water wash; abrasive blasting or sandblasting without HEPA exhaust; dry scraping, except near electrical outlets or when using a heat gun. Chemical paint removers containing methylene chloride are prohibited. Building components and structures adjacent to the removal process shall be appropriately protected from damage due to the removal process employed. Stripping shall be done according to manufacturer's recommendations. Stripped substrates shall be thoroughly washed and neutralized before applying a primer or sealing coat.

3.4.1.1 Low Temperature Heat Gun

Prior to beginning work, electrical fuses and adequate electrical supply shall be verified. Only fuses properly sized for the service, and otherwise permitted by code, shall be used. Properly sized fuses shall not be changed out with larger fuses to increase amperage beyond safe limits. Portable electric generators may be used to safely supply adequate amperage. An accessible garden hose with a pressure-release spray nozzle; a crowbar to remove smoldering wood; and a long-handled sledgehammer to open up walls exposed to smoldering insulation shall be readily available. A fully charged ABC-type (20 pound minimum) fire extinguisher shall be available within 100 feet of the work area. Adequate ventilation shall be provided for the work area. Worker protection shall include respirators equipped with combination HEPA filter/organic vapor cartridges. The Contractor shall equip heat guns with extension tubes or wire mesh as needed to prevent premature burnout of the heating elements and to minimize paint film scorching or smoking. Optimal heat gun/substrate separation is typically 3 to 6 inches.

3.4.1.2 HEPA Sanding

The HEPA vacuum shall be correctly sized to provide adequate airflow, permitting the system to operate properly. If longer exhaust hoses are used, a larger HEPA vacuum shall be provided to handle the extra pressure drop in the vacuum hose. The HEPA filter shall be operated in accordance with manufacturer's instructions. Worker protection shall include respirators or filtering facepieces equipped with HEPA filters.

3.4.1.3 Wet Scraping

Surfaces near electrical outlets shall not be moistened but shall be dry scraped only. Loose material shall be scraped from the surface and deposited onto the containment plastic. Damp scrapings shall be cleaned up as soon as possible to prevent tracking throughout the work area. Scraper blades shall be kept sharp. Additional scraper blades shall be supplied and shall be selected for the type of surface being scraped.

3.4.1.4 HEPA Vacuum Blasting

The blast head shall be shrouded under a vacuum and exhaust passed through a HEPA filter. The blast head shall remain in continuous contact with the surface to avoid dispersal of both the blast medium and particulate. The equipment shall be equipped with a device that separates the blast media from the material to be removed, effectively recycling the blast material and minimizing the amount of waste. Work shall be positioned to minimize the degree workers must reach above shoulder level, in order to minimize worker fatigue and loss of blast head contact with the surface.

3.4.1.5 HEPA Vacuum Needle Gun

The vacuum needle gun head shall be equipped with a vacuum shroud designed for the surface to be treated. The needle gun shall be operated to maximize surface contact of the vacuum shroud. Work shall be positioned to minimize the degree workers must reach above shoulder level, in order to minimize worker fatigue and loss of needle gun contact with the surface.

3.5 CLEARANCE PROCEDURES

3.5.1 Visual Inspection

QSHP shall perform a visual inspection, using the form at the end of this section, for each lead hazard control area to assure that lead hazard control activities, identified in the individual work task data elements, have been properly completed. The QSHP shall visually verify that lead hazards have been removed, control technology has been appropriately applied/installed and that the lead hazard control area is free of dust and paint chips generated by lead hazard control activities.

3.6 EVALUATION OF SAMPLING AND MONITORING RESULTS

Analytical results from samples taken during lead hazard control activities shall be evaluated to determine compliance with occupational safety and health standards and project specific control efficiency and clearance/clean up levels.

3.6.1 Occupational Safety and Health

The QSHP shall review the analytical results from samples taken for the initial exposure assessment and continued occupational safety and health monitoring if required. Effectiveness and adequacy of personal protective equipment, respirators, work practices, hygiene facilities and personal decontamination procedures shall be evaluated and upgrades/downgrades in equipment and procedures made. After notifying the Contracting Officer the following shall be applied:

a. Exposures over the PEL (0.05 mg/cubic meter):

1. Improve work practices to reduce exposures.

2. Don respirators.

3. Assure eating facilities and change rooms are clean and are free from settled dust.

4. Shower as part of personal decontamination.

b. Exposures over the Action Level (0.03 mg/cubic meter):

1. Assure exposed individuals enrolled in the medical surveillance program.

2. Assure exposed individuals enrolled in and up to date with lead exposure training requirements.

3.6.2 Control Efficiency of Containment Features

The QSHP shall review and document results of the visual inspection determining visual clearance criteria are being met while lead hazard control activities are being performed. The QSHP shall review analytical results from samples taken to determine if lead is migrating outside lead hazard control areas at levels in excess of clearance criteria. The QSHP shall notify the Contracting Officer and apply the following actions if results exceed project specific clearance levels outside the lead hazard control area:

a. Require/improve containment.

b. Improve work practices to reduce lead aerosol generation.

3.6.3 Removal of Lead Hazard Control Area

Upon acceptance of the final clearance certification by the Contracting Officer, and when authorized, cleared Lead Hazard Control Area boundary controls and warning signs shall be removed.

3.7 CLEARANCE REPORT

The QSHP shall prepare a clearance report including the following information:

a. Start and completion dates of lead hazard control activities.

b. Type of lead hazard control activity performed (i.e., abatement, interim control, renovation, remodeling), locations and lead hazards controlled or abated.

c. The name and address of each firm conducting lead hazard control activities and the name of each supervisor assigned to the project.

d. A detailed written description of the lead hazard control activities performed, including hazard control methods used, locations of rooms and/or components where lead hazard control activities occurred, reason for selecting particular hazard control methods for each component, and any suggested monitoring of encapsulants or enclosures.

e. Hazardous waste disposal documentation.

f. Certification of each Final Cleaning and Visual Inspection performed by the QSHP.

3.8 TITLE TO MATERIALS

Materials resulting from demolition work shall be come the property of the Contractor, and shall be disposed of in accordance with all applicable federal and state regulations.

3.9 PAYMENT FOR HAZARDOUS WASTE

Payment for disposal of hazardous waste will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-containing materials delivered is returned and a copy is furnished to the Government.

3.10 CERTIFICATION OF VISUAL INSPECTION

Certify that the lead hazard control ares(s) for each individual work task data elements have passed visual clearance criteria and are ready for clearance sampling. To pass visual clearance, lead hazards have to be removed; control technology appropriately applied/installed; the lead hazard control area must be free from visible dust debris, paint chips or any other residue that may have been generated by the lead hazard control activities.

Signature by the QSHP indicates that the described lead hazard control area(s) have passed visual clearance criteria. Provide detailed description of each Lead Hazard Control Area.

_____

_____

_____

BY:_____
QSHP Date

Print name and title
_____

CONTRACTING OFFICER ACCEPTANCE OR REJECTION

The Contracting Officer hereby determines that the Contractor has performed visual inspection of the lead hazard control area and by quality assurance inspection, finds the Contractor's work to be:

_____ Acceptable, ready for performance of clearance sampling

_____ Unacceptable, Contractor instructed to re-clean the lead hazard control area

BY: Contracting Officer's Representative
_____
Signature Date

Print name and
title_____

Lead Hazard Control Clearance Sampling Certification Form

Date_____

Name of QSHP or Certified Risk
Assessor_____

License No._____

Work Task Data Element _____

Clearance Levels _____
40 CFR 745 Clearance Levels
24 CFR 35 Clearance Levels

Sample quantity and location:
Windows _____
Floors _____
Exterior Soils _____

Date of sample collection_____Date Shipped to
lab_____

Shipped
by_____
Signature

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 16 - ELECTRICAL

SECTION 16070

SEISMIC PROTECTION FOR ELECTRICAL EQUIPMENT

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 SYSTEM DESCRIPTION
1.3.1 General Requirements
1.3.2 Electrical Equipment
1.3.3 Contractor Designed Bracing
1.3.4 Conduits Requiring No Special Seismic Restraints
1.4 EQUIPMENT REQUIREMENTS
1.4.1 Rigidly Mounted Equipment

PART 2 PRODUCTS

2.1 LIGHTING FIXTURE SUPPORTS

PART 3 EXECUTION

3.1 LIGHTING FIXTURES IN BUILDINGS
3.1.1 Ceiling Attached Fixtures
3.1.2 Assembly Mounted on Outlet Box
3.1.3 Wall or Ceiling Mounted Light Unit

-- End of Section Table of Contents --

SECTION 16070

SEISMIC PROTECTION FOR ELECTRICAL EQUIPMENT

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

TI 809-04	(1998) Seismic Design for Buildings

UNDERWRITERS LABORATORIES (UL)

UL 1570	(1995; Rev thru Feb 1999) Fluorescent Lighting Fixtures
UL 1571	(1995; Rev thru Nov 1999) Incandescent Lighting Fixtures

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Contractor Designed Bracing

Equipment Requirements;

Lighting Fixtures in Buildings;

1.3 SYSTEM DESCRIPTION

1.3.1 General Requirements

The requirements for seismic protection measures described in this section shall be applied to the electrical equipment and systems listed below.

1.3.2 Electrical Equipment

Electrical equipment shall include the following items to the extent required on the drawings or in other sections of these specifications:

Control Panels
Pumps with Motors

Light Fixtures
Transformers

1.3.3 Contractor Designed Bracing

The Contractor shall design the bracing in accordance with TI 809-04 and additional data furnished by the Contracting Officer. Resistance to lateral forces induced by earthquakes shall be accomplished without consideration of friction resulting from gravity loads. TI 809-04 uses parameters for the building, not for the equipment in the building; therefore, corresponding adjustments to the formulas shall be required. Loadings determined using TI 809-04 are based on strength design; therefore, the AISC LRFP specifications shall be used for the design. The bracing for the following electrical equipment and systems shall be developed by the Contractor.

1.3.4 Conduits Requiring No Special Seismic Restraints

Seismic restraints may be omitted from electrical conduit less than 2-1/2 inches trade size. All other interior conduit, shall be seismically protected as specified.

1.4 EQUIPMENT REQUIREMENTS

1.4.1 Rigidly Mounted Equipment

The following specific items of equipment to be furnished under this contract shall be constructed and assembled to withstand the seismic forces specified in TI 809-04, Chapter 10. Each item of rigid electrical equipment shall be entirely located and rigidly attached on one side only of a building expansion joint. Piping, electrical conduit, etc., which cross the expansion joint shall be provided with flexible joints that are capable of accommodating displacements equal to the full width of the joint in both orthogonal directions.

Transformers
Control Panels
Load centers

PART 2 PRODUCTS

2.1 LIGHTING FIXTURE SUPPORTS

Lighting fixtures and supports shall conform to UL 1570 or UL 1571 as applicable.

PART 3 EXECUTION

3.1 LIGHTING FIXTURES IN BUILDINGS

Lighting fixtures and supports shall conform to the following:

3.1.1 Ceiling Attached Fixtures

3.1.2 Assembly Mounted on Outlet Box

A supporting assembly, that is intended to be mounted on an outlet box, shall be designed to accommodate mounting features on 4 inches boxes, plaster rings, and fixture studs.

3.1.3 Wall or Ceiling Mounted Light Unit

Attachments for wall or ceiling -mounted emergency light units shall be designed and secured for the worst expected seismic disturbance at the site.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 16 - ELECTRICAL

SECTION 16370

ELECTRICAL DISTRIBUTION SYSTEM, AERIAL

PART 1 GENERAL

1.1 REFERENCES
1.2 GENERAL REQUIREMENTS
1.2.1 Terminology
1.2.2 Service Conditions
1.3 SUBMITTALS
1.4 DELIVERY, STORAGE, AND HANDLING

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS
2.2 STANDARD PRODUCT
2.3 NAMEPLATES
2.3.1 General
2.3.2 Liquid-Filled Transformer Nameplates
2.4 CORROSION PROTECTION
2.4.1 Aluminum Materials
2.4.2 Ferrous Metal Materials
2.4.2.1 Hardware
2.4.2.2 Equipment
2.4.3 Finishing
2.5 CONDUCTORS, CONNECTORS, AND SPLICES
2.5.1 Aluminum Conductors
2.5.2 Connectors and Splices
2.6 MEDIUM-VOLTAGE LINES
2.6.1 Bare Medium-Voltage Lines
2.7 LOW-VOLTAGE LINES
2.8 POLES AND HARDWARE
2.8.1 Wood Poles
2.8.2 Pole Line Hardware
2.8.3 Armless Construction
2.8.4 Guy Assemblies
2.9 INSULATORS
2.9.1 Medium-Voltage Line Insulators
2.9.2 Low-Voltage Line Insulators
2.9.3 Apparatus Insulators
2.10 CROSSARM ASSEMBLIES
2.10.1 Crossarms
2.11 FUSES AND SWITCHES, MEDIUM-VOLTAGE
2.11.1 Fuse Cutouts
2.12 TRANSFORMERS
2.13 SURGE ARRESTERS
2.14 GROUNDING AND BONDING
2.14.1 Driven Ground Rods
2.14.2 Grounding Conductors

2.15 LIQUID DIELECTRICS
2.16 FACTORY TESTS

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS
3.1.1 Conformance to Codes
3.1.2 Verification of Dimensions
3.1.3 Tree Trimming
3.2 POLE INSTALLATION
3.2.1 Wood Pole Setting
3.3 CROSSARM MOUNTING
3.3.1 Line Arms and Buck Arms
3.3.2 Equipment Arms
3.4 GUY INSTALLATION
3.5 CONDUCTOR INSTALLATION
3.5.1 Line Conductors
3.5.2 Connectors and Splices
3.5.3 Conductor-To-Insulator Attachments
3.5.4 Armor Rods
3.5.5 Low-Voltage Insulated Cables
3.6 TRANSFORMER INSTALLATION
3.7 CONNECTIONS TO UTILITY LINES
3.8 CONNECTIONS BETWEEN AERIAL AND UNDERGROUND SYSTEMS
3.9 CONNECTIONS TO BUILDINGS
3.9.1 Aerial Services
3.9.2 Underground Services
3.10 GROUNDING
3.10.1 Grounding Electrodes
3.10.2 Grounding and Bonding Connections
3.10.3 Grounding Electrode Conductors
3.11 FIELD TESTING
3.11.1 General
3.11.2 Safety
3.11.3 Ground-Resistance Tests
3.11.4 Sag and Tension Test
3.11.5 Operating Tests
3.12 ACCEPTANCE

-- End of Section Table of Contents --

SECTION 16370

ELECTRICAL DISTRIBUTION SYSTEM, AERIAL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C29.2	(1992) Insulators - Wet-Process Porcelain and Toughened Glass - Suspension Type
ANSI C29.3	(1986; R 1995) Wet Process Porcelain Insulators - Spool Type
ANSI C29.5	(1984; R 1995) Wet-Process Porcelain Insulators - Low- and Medium-Voltage Types
ANSI C29.6	(1996) Wet-Process Porcelain Insulators - High-Voltage Pin Type
ANSI C29.8	(1985; R 1995) Wet-Process Porcelain Insulators - Apparatus, Cap and Pin Type
ANSI C29.9	(1983; R 1996) Wet-Process Porcelain Insulators - Apparatus, Post-Type
ANSI C57.12.20	(1997) Overhead Type Distribution Transformers, 500 KVA and Smaller: High Voltage 34 500 Volts and Below: Low Voltage, 7970/13 800 Y Volts and Below
ANSI C135.1	(1979) Galvanized Steel Bolts and Nuts for Overhead Line Construction
ANSI C135.2	(1999) Threaded Zinc-Coated Ferrous Strand-Eye Anchor Rods and Nuts for Overhead Line Construction
ANSI C135.4	(1987) Zinc-Coated Ferrous Eyebolts and Nuts for Overhead Line Construction
ANSI C135.14	(1979) Staples with Rolled or Slash Points for Overhead Line Construction
ANSI C135.22	(1988) Zinc-Coated Ferrous Pole-Top Insulator Pins with Lead Threads for Overhead Line Construction
ANSI O5.1	(1992) Specifications and Dimensions for

Wood Poles

ASTM INTERNATIONAL (ASTM)

ASTM A 123/A 123M	(2001a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 153/A 153M	(2001a) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 475	(1998) Zinc-Coated Steel Wire Strand
ASTM A 575	(1996; R 2002) Steel Bars, Carbon, Merchant Quality, M-Grades
ASTM A 576	(1990b; R 2000) Steel Bars, Carbon, Hot-Wrought, Special Quality
ASTM B 8	(1999) Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B 117	(1997) Operating Salt Spray (Fog) Apparatus
ASTM D 923	(1997) Sampling Electrical Insulating Liquids
ASTM D 1654	(1992; R 2000) Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
ASTM D 4059	(2000) Analysis of Polychlorinated Biphenyls in Insulating Liquids by Gas Chromatography

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)

AWPA C4	(1999) Poles - Preservative Treatment by Pressure Processes
AWPA C25	(2001) Sawn Crossarms - Preservative Treatment by Pressure Processes
AWPA P1/P13	(2001) Standard for Creosote Preservative
AWPA P5	(2001) Standard for Waterborne Preservatives
AWPA P8	(2001) Standard for Oil-Borne Preservatives
AWPA P9	(2001) Standards for Solvents and Formulations for Organic Preservative Systems

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C2	(2002) National Electrical Safety Code

IEEE C57.12.00	(2000) General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers
IEEE C57.19.00	(1991; R 1997) Standard General Requirements and Test Procedures for Outdoor Power Apparatus Bushings
IEEE C57.19.01	(2000) Performance Characteristics and Dimensions for Outdoor Apparatus Bushings
IEEE C62.1	(1989; R 1994) Surge Arresters for AC Power Circuits
IEEE C62.2	(1987; R 1994) Guide for the Application of Gapped Silicon-Carbide Surge Arresters for Alternating Current Systems
IEEE C62.11	(1999) Metal-Oxide Surge Arresters for AC Power Circuits
IEEE Std 81	(1983) Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System (Part 1)
IEEE Std 100	(2000) IEEE Standard Dictionary of Electrical and Electronics Terms

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA HV 2	(1984; R 1996) Application Guide for Ceramic Suspension Insulators
NEMA LA 1	(1992; R 1999) Surge Arresters
NEMA SG 2	(1993) High Voltage Fuses

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2002) National Electrical Code

U.S. DEPARTMENT OF AGRICULTURE (USDA)

RUS Bull 1728H-701	(1993) REA Specification for Wood Crossarms (Solid and Laminated), Transmission Timbers and Pole Keys

UNDERWRITERS LABORATORIES (UL)

UL 467	(1993; Rev thru Feb 2001) Grounding and Bonding Equipment
UL 486A	(1997; Rev thru May 2001) Wire Connectors and Soldering Lugs for Use with Copper Conductors
UL 486B	(1997; Rev thru May 2001) Wire Connectors

for Use with Aluminum Conductors

1.2 GENERAL REQUIREMENTS

1.2.1 Terminology

Terminology used in this specification is as defined in IEEE Std 100.

1.2.2 Service Conditions

Items provided under this section shall be specifically suitable for the following service conditions. Seismic details shall conform to SECTION 16070 SEISMIC PROTECTION FOR ELECTRICAL EQUIPMENT .

a. Ambient Temperature -50 degrees Farenheit

b. Seismic Parameters Design category per Section 13080.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Electrical Distribution System ; G

Detail drawings consisting of equipment drawings, illustrations, schedules, instructions, diagrams and other information necessary to define the installation and enable the Government to check conformity with the requirements of the contract drawings. Detail drawings shall as a minimum include:

a. Pole mounted transformers

b. Poles

c. Primary and secondary wire

d. Crossarms.

h. Fused cut-outs

i. Insulators.

j. Surge arresters.

If departures from the contract drawings are deemed necessary by the Contractor, complete details of such departures shall be submitted with the detail drawings. Approved departures shall be made at no additional cost to the Government.

Nameplates;

Catalog cuts, brochures, circulars, specifications, product data, and printed information in sufficient detail and scope to

verify compliance with the requirements of the contract documents.

SD-06 Test Reports

Field Testing;G

A proposed field test plan 20 days prior to testing the installed system. No field test shall be performed until the test plan is approved. The test plan shall consist of complete field test procedures including tests to be performed, test equipment required, and tolerance limits.

Verify all transformer secondary voltges under load at the service disconnects. Submitt test results.

1.4 DELIVERY, STORAGE, AND HANDLING

Devices and equipment shall be visually inspected by the Contractor when received and prior to acceptance from conveyance. Stored items shall be protected from the environment in accordance with the manufacturer's published instructions. Damaged items shall be replaced. Oil filled transformers and switches shall be stored in accordance with the manufacturer's requirements. Wood poles held in storage for more than 2 weeks shall be stored in accordance with ANSI O5.1. Handling of wood poles shall be in accordance with ANSI O5.1, except that pointed tools capable of producing indentations more than inch in depth shall not be used. Metal poles shall be handled and stored in accordance with the manufacturer's instructions.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

Products shall conform to the following requirements. Items of the same classification shall be identical including equipment, assemblies, parts, and components.

2.2 STANDARD PRODUCT

Material and equipment shall be the standard product of a manufacturer regularly engaged in the manufacture of the product and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening.

2.3 NAMEPLATES

2.3.1 General

Each major component shall have the manufacturer's name, address, type or style, model or serial number, and catalog number on a nameplate securely attached to the equipment. Equipment containing liquid-dielectrics shall have the type of dielectric on the nameplate. Nameplates shall be made of noncorrosive metal. As a minimum, nameplates shall be provided for transformers, regulators, circuit breakers, capacitors, meters and switches.

2.3.2 Liquid-Filled Transformer Nameplates

Power transformers shall be provided in accordance with IEEE C57.12.00. Nameplates shall indicate the number of gallons and composition of liquid-dielectric, and shall be permanently marked with a statement that the transformer dielectric to be supplied is non-polychlorinated biphenyl. If transformer nameplate is not so marked, the Contractor shall furnish manufacturer's certification for each transformer that the dielectric in non-PCB classified, with less than 2 ppm PCb content in accordance with paragraph LIQUID DIELECTRICS. Certifications shall be related to serial numbers on transformer nameplates. Transformer dielectric exceeding the 2 ppm PCB content or transformers without certification will be considered as PCB insulated and will not be accepted.

2.4 CORROSION PROTECTION

2.4.1 Aluminum Materials

2.4.2 Ferrous Metal Materials

2.4.2.1 Hardware

Ferrous metal hardware shall be hot-dip galvanized in accordance with ASTM A 153/A 153M and ASTM A 123/A 123M.

2.4.2.2 Equipment

Equipment and component items, including but not limited to transformers and ferrous metal luminaires not hot-dip galvanized or porcelain enamel finished, shall be provided with corrosion-resistant finishes which shall withstand 480 hours of exposure to the salt spray test specified in ASTM B 117 without loss of paint or release of adhesion of the paint primer coat to the metal surface in excess of 1/16 inch from the test mark. The described test mark and test evaluation shall be in accordance with ASTM D 1654 with a rating of not less than 7 in accordance with TABLE 1, (procedure A). Cut edges or otherwise damaged surfaces of hot-dip galvanized sheet steel or mill galvanized sheet steel shall be coated with a zinc rich paint conforming to the manufacturer's standard.

2.4.3 Finishing

Painting required for surfaces not otherwise specified and finish painting of items only primed at the factory shall be as specified in Section 09900 PAINTS AND COATINGS.

2.5 CONDUCTORS, CONNECTORS, AND SPLICES

2.5.1 Aluminum Conductors

Aerial service drops from transformers to buildings shall be aluminum conductors as indicated on drawings.

2.5.2 Connectors and Splices

Connectors and splices shall be of aluminum alloys for aluminum-composition conductors, and a type designed to minimize galvanic corrosion for copper to aluminum-composition conductors. Aluminum-composition and aluminum-composition to copper shall comply

with UL 486B, and copper-to-copper shall comply with UL 486A.

2.6 MEDIUM-VOLTAGE LINES

2.6.1 Bare Medium-Voltage Lines

Bare medium-voltage line conductors shall be hard-drawn-copper, CU. Conductor types shall not be mixed on any project, unless specifically indicated. Conductors larger than No. 2 AWG shall be stranded.

2.7 LOW-VOLTAGE LINES

Neutral-supported secondary and service drop conductors shall be insulated copper with bare hard-drawn-copper or copper-clad steel neutrals.

2.8 POLES AND HARDWARE

Poles shall be of lengths and classes indicated.

2.8.1 Wood Poles

Wood poles shall comply with ANSI O5.1, and shall be pressure treated in accordance with AWPA C4, with creosote conforming to AWPA P1/P13or with oil-borne preservatives and petroleum conforming to AWPA P8 and AWPA P9, respectively, and waterborne preservatives conforming to AWPA P5. Waterborne preservatives shall be either chromated or ammoniacal copper arsenate. Any species listed in ANSI O5.1 for which a preservative treatment is not specified in AWPA C4, shall not be used; northern white cedar, if treated as specified for western red cedar, and western fir, if treated as specified for Douglas fir, may be used. Wood poles shall have pole markings located approximately 10 feet from pole butts for poles 50 feet or less in length, and 14 feet from the pole butts for poles longer than 55 feet in length. Poles shall be machine trimmed by turning smooth full length, and shall be roofed, gained, and bored prior to pressure treatment. Where poles are not provided with factory-cut gains, metal gain plates shall be provided.

2.8.2 Pole Line Hardware

Zinc-coated hardware shall comply with ANSI C135.1, ANSI C135.2, ANSI C135.4, ANSI C135.14 ANSI C135.22. Steel hardware shall comply with ASTM A 575 and ASTM A 576. Hardware shall be hot-dip galvanized in accordance with ASTM A 153/A 153M. Pole-line hardware shall be hot-dip galvanized steel. . Washers shall be installed under boltheads and nuts on wood surfaces and elsewhere as required. Washers used on through-bolts and double-arming bolts shall be approximately 2-1/4 inches square and 3/16 inch thick. The diameter of holes in washers shall be the correct standard size for the bolt on which a washer is used. Washers for use under heads of carriage-bolts shall be of the proper size to fit over square shanks of bolts. Eye bolts, bolt eyes, eyenuts, strain-load plates, lag screws, guy clamps, fasteners, hooks, shims, and clevises shall be used wherever required to support and to protect poles, brackets, crossarms, guy wires, and insulators.

2.8.3 Armless Construction

Pole mounting brackets for line-post or pin insulators and eye bolts for suspension insulators shall be as shown. Brackets shall be attached to

poles with a minimum of two bolts. Brackets may be either provided integrally as part of an insulator or attached to an insulator with a suitable stud. Bracket mounting surface shall be suitable for the shape of the pole. Brackets for wood poles shall have wood gripping members. Horizontal offset brackets shall have a 5-degree uplift angle. Pole top brackets shall conform to ANSI C135.22, except for modifications necessary to provide support for a line-post insulator. Brackets shall provide a strength exceeding that of the required insulator strength, but in no case less than a 2800 pound cantilever strength.

2.8.4 Guy Assemblies

Guy assemblies shall be zinc-coated steel in accordance with ASTM A 475. Guy assemblies, including insulators and attachments, shall provide a strength exceeding the required guy strength. Three-eye thimbles shall be provided on anchor rods to permit attachment of individual primary, secondary, and communication down guys. Anchors shall provide adequate strength to support all loads. Guy strand shall be 7 strand. Guy material shall be Class A zinc-coated-steel utilities grade, with a minimum breaking strength not less than 6000 pounds, except where two or more guys are used to provide the required strength. Guy rods shall be not less than feet in length by inch in diameter.

2.9 INSULATORS

Insulators shall comply with NEMA HV 2 for general requirements. Epoxiltor suspension insulators shall be used at corners, angles, dead-ends, other areas where line insulators do not provide adequate strength, and as indicated. Mechanical strength of suspension insulators and hardware shall exceed the rated breaking strength of the attached conductors.

2.9.1 Medium-Voltage Line Insulators

Medium-voltage line insulators shall comply with ANSI C29.2, ANSI C29.5, and ANSI C29.6, and as applicable. Ratings shall not be lower than the ANSI classes indicated in TABLE I. ANSI Class 55-4 pin insulators shall be used for crossarm construction. Pin insulators for use on voltages in excess of 6 kV phase-to-phase shall be radio-interference-free.

TABLE I

MINIMUM ANSI RATING OF MEDIUM-VOLTAGE INSULATORS BY CLASS

Voltage Level	Line-Post	Pin	Suspension
6 kV to 15 kV	57-1 or 11 57-2 or 12	55-5 56-3	Two 52-2 Two 52-3 or 4

2.9.2 Low-Voltage Line Insulators

Low-voltage line insulators shall comply with ANSI C29.2 and ANSI C29.3 as applicable. Spool insulators for use on low-voltage lines shall be mounted on clevis attachments or secondary racks and shall be not smaller than Class 53-3. Suspension insulators on clevis attachments used at dead-ends shall be not smaller than Class 52-1.

2.9.3 Apparatus Insulators

Apparatus insulators shall comply with IEEE C57.19.00, IEEE C57.19.01, ANSI C29.8, and ANSI C29.9 as applicable.

2.10 CROSSARM ASSEMBLIES

2.10.1 Crossarms

Crossarms shall comply with RUS Bull 1728H-701 and shall be solid wood, distribution type, except cross-sectional area with pressure treatment conforming to AWPA C25, and a 1/4 inch, 45 degree chamfer on all top edges. Cross-sectional area minimum dimensions shall be 4-1/4 inches in height by 3-1/4 inches in depth in accordance with IEEE C2 for Grade B construction. Crossarms shall be 8 feet in length, except that 10 foot crossarms shall be used for crossarm-mounted banked single-phase transformers or elsewhere as indicated. Crossarms shall be machined, chamfered, trimmed, and bored for stud and bolt holes before pressure treatment. Factory drilling shall be provided for pole and brace mounting, for four pin or four vertical line-post insulators, and for four suspension insulators, except where otherwise indicated or required. Drilling shall provide required climbing space and wire clearances. Crossarms shall be straight and free of twists to within 1/10 inch per foot of length. Bend or twist shall be in one direction only.

2.11 FUSES AND SWITCHES, MEDIUM-VOLTAGE

2.11.1 Fuse Cutouts

Medium-voltage fuses and cutouts shall comply with NEMA SG 2 and shall be of the nonloadbreak type construction rated 15 kV and of the normal duty type. Open-link cut-outs are not acceptable. Fuses shall be either indicating or dropout type. Fuse ratings shall be as indicated. Fuse cutouts shall be equipped with mounting brackets suitable for the indicated installations.

2.12 TRANSFORMERS

Transformers shall comply with IEEE C57.12.00 for general requirements and ANSI C57.12.20 for specific requirements for overhead transformers. Overhead distribution transformers shall be of the outdoor type, less-flammable liquid-insulated with high molecular-weight-hydrocarbon liquid single-phase or three-phase as indicated and have two separate windings per phase. Transformers shall be provided with necessary auxiliary mounting devices suitable for the indicated installation. Transformers shall have two 2-1/2 percent rated kVA high-voltage taps above and below rated primary voltage. Transformer installations shall include one primary fuse cutout and one surge arrester for each ungrounded phase conductor. Self-protected transformers are not acceptable. Transformer tanks shall have a standard gray finish.

2.13 SURGE ARRESTERS

Surge arresters shall comply with NEMA LA 1 and IEEE C62.1, IEEE C62.2, and IEEE C62.11, and shall be provided for protection of aerial-to-underground transitions, automatic circuit reclosers, capacitor equipment, group-operated load-interrupter switches, transformers and other indicated equipment. Arresters shall be station class, rated as shown. Arresters shall be equipped with mounting brackets suitable for the indicated installations. Arresters shall be

of the metal-oxide varistor type suitable for outdoor installations.

2.14 GROUNDING AND BONDING

2.14.1 Driven Ground Rods

Ground rods shall be of copper-clad steel conforming to UL 467 not less than 3/4 inch in diameter by 10 feet in length of the sectional type driven full length into the earth.

2.14.2 Grounding Conductors

Grounding conductors shall be bare. Bare conductors shall be ASTM B 8 soft-drawn unless otherwise indicated. Aluminum is not acceptable.

2.15 LIQUID DIELECTRICS

Liquid dielectrics for transformers, capacitors, reclosers, and other liquid-filled electrical equipment shall be non-polychlorinated biphenyl (PCB) mineral-oil or less-flammable liquid as specified. Nonflammable fluids shall not be used. Tetrachloroethylene (perchloroethylene) and 1, 2, 4 tetrachlorobenzene fluids shall not be used. Liquid dielectrics in retrofitted equipment shall be certified by the manufacturer as having less than 2 parts-per-million (ppm) PCB content. In lieu of the manufacturer's certification, the Contractor may submit a test sample of the dielectric in accordance with ASTM D 923 and have tests performed per ASTM D 4059 at a testing facility approved by the Contracting Officer. Equipment with test results indicating PCB level exceeding 2 ppm shall be replaced.

2.16 FACTORY TESTS

Factory tests shall be performed, as follows, in accordance with the applicable publications and with other requirements of these specifications. The Contracting Officer shall be notified at least 10 days before the equipment is ready for testing.

a. Transformers: Manufacturer's standard design tests in accordance with IEEE C57.12.00.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

Equipment and devices shall be installed and energized in accordance with the manufacturer's published instructions. Circuits installed in conduits or underground and splices and terminations for medium-voltage cable shall conform to the requirements of Section 16375 ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND. Secondary circuits installed in conduit on poles shall conform to the requirements of Section 16415 ELECTRICAL WORK, INTERIOR.

3.1.1 Conformance to Codes

The installation shall comply with the requirements and recommendations of IEEE C2 for heavy loading districts, Grade B construction. No reduction in clearance shall be made. The installation shall also comply with the applicable parts of NFPA 70.

3.1.2 Verification of Dimensions

The Contractor shall become familiar with details of the work, shall verify dimensions in the field, and shall notify the Contracting Officer of any discrepancy before performing any work.

3.1.3 Tree Trimming

Where lines pass through trees, trees shall be trimmed at least 15 feet clear on both sides horizontally and below for medium-voltage lines, and 5 feet clear on both sides horizontally and below for other lines, and no branch shall overhang horizontal clearances.

3.2 POLE INSTALLATION

Joint-use electric/roadway-lighting poles for overhead electric and communication lines shall be wood poles utilizing crossarm construction. Cluster-mounted banked single-phase transformer installations shall be provided. Crossarm construction shall be provided for support of other equipment, except where direct-pole mounting is indicated. Provision for communication services is required on pole-line construction, except where specifically noted otherwise. A vertical pole space of not less than 2 feet shall be reserved at all locations.

3.2.1 Wood Pole Setting

Wood Pole Setting: Wood poles shall be set straight and firm. In normal firm ground, minimum pole-setting depths shall be as listed in Table II. In rocky or swampy ground, pole-setting depths shall be decreased or increased respectively in accordance with the local utility's published standards and as approved. In swampy or soft ground, a bog shoe shall be used where support for a pole is required. Poles in straight runs shall be in a straight line. Curved poles shall be placed with curvatures in the direction of the pole line. Poles shall be set to maintain as even a grade as practicable. When the average ground run is level, consecutive poles shall not vary more than 5 feet in height. When the ground is uneven, poles differing in length shall be kept to a minimum by locating poles to avoid the highest and lowest ground points. If it becomes necessary to shorten a pole, a piece shall be sawed off the top end and roofed. If any pole is shortened after treatment, the shortened end of the pole shall be given an application of hot preservative. Where poles are set on hilly terrain, along edges of cuts or embankments, or where soil may be washed out, special precautions shall be taken to ensure durable pole foundations, and the setting depth shall be measured from the lower side of the pole. Holes shall be dug large enough to permit proper use of tampers to the full depth of a hole. Earth shall be placed into the hole in 6 inch maximum layers, then thoroughly tamped before the next layer is placed. Surplus earth shall be placed around each pole in a conical shape and packed tightly to drain water away from poles.

TABLE II

MINIMUM POLE-SETTING DEPTH (FEET)

Length Overall Feet	Straight Lines	Curves, Corners, and Points of Extra Strain
35	6.0	6.0
40	6.5	6.5
45	6.5	7.0

3.3 CROSSARM MOUNTING

Crossarms shall be bolted to poles with 5/8 inchthrough-bolts with square washers at each end. Bolts shall extend not less than 1/8 inch nor more than 2 inches beyond nuts. On single crossarm construction, the bolt head shall be installed on the crossarm side of the pole. Metal crossarm braces shall be provided on crossarms. Angle braces are required for 10 foot crossarms and shall be 60 inch span by 18 inch drop formed in one piece from 1-1/2 by 1-1/2 by 3/16 inch angle. Angle braces shall be bolted to crossarms with 1/2 inch bolts with round or square washers between boltheads and crossarms, and secured to poles with 5/8 inch through-bolts. Double crossarms shall be securely held in position by means of 5/8 inch double-arming bolts. Each double-arming bolt shall be equipped with four nuts and four square washers.

3.3.1 Line Arms and Buck Arms

Line arms and buck arms shall be set at right angles to lines for straight runs and for angles 45 degrees and greater; and line arms shall bisect angles of turns of less than 45 degrees. Dead-end assemblies shall be used for turns where shown. Buckarms shall be installed, as shown, at corners and junction poles. Double crossarms shall be provided at ends of joint use or conflict sections, at dead-ends, and at angles and corners to provide adequate vertical and longitudinal strength. Double crossarms shall be provided at each line-crossing structure and where lines not attached to the same pole cross each other.

3.3.2 Equipment Arms

Equipment arms shall be set parallel or at right angles to lines as required to provide climbing space. Equipment arms shall be located below line construction to provide necessary wire and equipment clearances.

3.4 GUY INSTALLATION

Guys shall be provided where shown, with loads and strengths as indicated, and wherever conductor tensions are not balanced, such as at angles, corners, and dead-ends. Where a single guy will not provide the required strength, two or more guys shall be provided. Where guys are wrapped around poles, at least two guy hooks shall be provided and pole shims shall be provided where guy tension exceeds 6000 pounds. Guy clamps 6 inches in length with three 5/8 inch bolts, or offset-type guy

clamps, or approved guy grips shall be provided at each guy terminal. Guy-strain insulators shall be provided in each guy for wood poles. Multiple-helix screw anchors shall be provided in marshy ground; rock anchors shall be installed in rock at right angles to guys, elsewhere anchors shall be of an expanding type, except that power installed screw anchors of equivalent holding power are acceptable. A half-round yellow polyvinyl, fiberglass, or other suitable plastic guy marker, not less than 8 feet in length, shall be provided at the anchor end of each guy shown, securely clamped to the guy or anchor at the bottom and top of the marker. Holding capacities for down guys shall be based on a lead angle of 45 degrees.

3.5 CONDUCTOR INSTALLATION

3.5.1 Line Conductors

Unless otherwise indicated, conductors shall be installed in accordance with manufacturer's approved tables of sags and tensions. Proper care shall be taken in handling and stringing conductors to avoid abrasions, sharp bends, cuts, kinks, or any possibility of damage to insulation or conductors. Conductors shall be paid out with the free end of conductors fixed and cable reels portable, except where terrain or obstructions make this method unfeasible. Bend radius for any insulated conductor shall not be less than the applicable NEMA specification recommendation. Conductors shall not be drawn over rough or rocky ground, nor around sharp bends. When installed by machine power, conductors shall be drawn from a mounted reel through stringing sheaves in straight lines clear of obstructions. Initial sag and tension shall be checked by the Contractor, in accordance with the manufacturer's approved sag and tension charts, within an elapsed time after installation as recommended by the manufacturer.

3.5.2 Connectors and Splices

Connectors and splices shall be mechanically and electrically secure under tension and shall be of the nonbolted compression type. The tensile strength of any splice shall be not less than the rated breaking strength of the conductor. Splice materials, sleeves, fittings, and connectors shall be noncorrosive and shall not adversely affect conductors. Aluminum-composition conductors shall be wire brushed and an oxide inhibitor applied before making a compression connection. Connectors which are factory-filled with an inhibitor are acceptable. Inhibitors and compression tools shall be of types recommended by the connector manufacturer. Primary line apparatus taps shall be by means of hot line clamps attached to compression type bail clamps (stirrups). Low-voltage connectors for copper conductors shall be of the solderless pressure type. Noninsulated connectors shall be smoothly taped to provide a waterproof insulation equivalent to the original insulation, when installed on insulated conductors. On overhead connections of aluminum and copper, the aluminum shall be installed above the copper.

3.5.3 Conductor-To-Insulator Attachments

Conductors shall be attached to insulators by means of clamps, shoes or tie wires, in accordance with the type of insulator. For insulators requiring conductor tie-wire attachments, tie-wire sizes shall be as indicated in TABLE II.

TABLE II

TIE-WIRE REQUIREMENTS

CONDUCTOR Copper (AWG)	TIE WIRE Soft-Drawn Copper (AWG)
6	8
4 and 2	6
1 through 3/0	4
4/0 and larger	2
AAC, AAAC, or ACSR (AWG)	AAAC OR AAC (AWG)
Any size	6 or 4

3.5.4 Armor Rods

Armor rods shall be provided for AAC, AAAC, and ACSR conductors. Armor rods shall be installed at supports, except armor rods will not be required at primary dead-end assemblies if aluminum or aluminum-lined zinc-coated steel clamps are used. Lengths and methods of fastening armor rods shall be in accordance with the manufacturer's recommendations. For span lengths of less than 200 feet, flat aluminum armor rods may be used. Flat armor rods, not less than 0.03 by 0.25 inch shall be used on No. 1 AWG AAC and AAAC and smaller conductors and on No. 5 AWG ACSR and smaller conductors. On larger sizes, flat armor rods shall be not less than 0.05 by 0.30 inches. For span lengths of 200 feet or more, preformed round armor rods shall be used.

3.5.5 Low-Voltage Insulated Cables

Low-voltage cables shall be supported on clevis fittings using spool insulators. Dead-end clevis fittings and suspension insulators shall be provided where required for adequate strength. Dead-end construction shall provide a strength exceeding the rated breaking strength of the neutral messenger. Clevis attachments shall be provided with not less than 5/8 inch diameter through-bolts, 8 inches long.

3.6 TRANSFORMER INSTALLATION

Transformers shall be carefully installed so as not to scratch finishes or damage bushings. Transformers shall be installed in accordance with the manufacturer's instructions. After installation, surfaces shall be inspected and scratches shall be touched up with a finish provided by the transformer manufacturer for this purpose.

3.7 CONNECTIONS TO UTILITY LINES

The Contractor shall coordinate the work with the Contracting Officer and shall provide for final connections to the installation electric lines.

3.8 CONNECTIONS BETWEEN AERIAL AND UNDERGROUND SYSTEMS

Connections between aerial and underground systems shall be made as shown. Underground cables shall be extended up poles in conduit to

cable terminations. Conduits shall be secured to poles by conduit supports spaced not more than 10 feet apart and with one support not more than 12 inches from any bend or termination. Cables shall be supported by devices separate from the conduit or guard, near their point of exit from the riser conduit or guard. Cables guards shall be secured in accordance with the manufacturers published procedure. Risers shall be equipped with bushings to protect cables. Capnut potheads shall be used to terminate medium-voltage multiple-conductor cable.

3.9 CONNECTIONS TO BUILDINGS

3.9.1 Aerial Services

Connections to buildings shall be made at approximately the point indicated and shall be connected to the service entrance conductors. Supports at buildings shall be adequate to withstand required pulls; supports shall not be rated less than 1000 pounds. Drip loops shall be formed on conductors at entrances to buildings, cabinets, or conduits. Service-entrance conduits with termination fittings and conductors within the building, including sufficient slack for connection to aerial service cables, shall conform to the requirements of Section 16415 ELECTRICAL WORK, INTERIOR.

3.9.2 Underground Services

Connections to buildings shall be made at the point indicated and shall be terminated at the service entrance equipment terminals. Cable pulling shall be in accordance with Section 16375, ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND. Service entrance conduits with termination fittings and conductors within the building shall conform to the requirements of Section 16415 ELECTRICAL WORK, INTERIOR.

3.10 GROUNDING

Noncurrent-carrying metal parts of equipment and conductor assemblies, such as luminaires, medium-voltage cable terminations and messengers, metal poles, operating mechanisms of pole top switches, panel enclosures, transformers, capacitors, recloser frames (cases) and other noncurrent-carrying metal items shall be grounded. Additional grounding of equipment, neutral, and surge arrester grounding systems shall be installed at poles where indicated.

3.10.1 Grounding Electrodes

Grounding electrodes shall be installed as follows:

a. Driven rod electrodes - Unless otherwise indicated, ground rods shall be located approximately 3 feet out from base of the pole and shall be driven into the earth until the tops of the rods are approximately 1 foot below finished grade. Multiple rods shall be evenly spaced at least 10 feet apart and connected together 2 feet below grade with a minimum No. 6 bare copper conductor.

d. Ground Resistance - The maximum resistance of a driven ground rod shall not exceed 25 ohms under normally dry conditions. Whenever the required ground resistance is not met, provide additional electrodes, to achieve the specified ground

resistance. The additional electrodes will be up to three, 8 feet rods spaced a minimum of 10 feet apart. In high ground resistance, UL listed chemically charged ground rods may be used. If the resultant resistance exceeds 25 ohms measured not less than 48 hours after rainfall, the Contracting Officer shall be notifies immediately. Connections below grade shall be fusion welded. Connections above grade shall be fusion welded or shall use UL 467 approved connectors.

3.10.2 Grounding and Bonding Connections

Connections above grade shall be made by the fusion-welding process or with bolted solderless connectors in compliance with UL 467, and those below grade shall be made by a fusion-welding process. Where grounding conductors are connected to aluminum-composition conductors, specially treated or lined copper-to-aluminum connectors suitable for this purpose shall be used.

3.10.3 Grounding Electrode Conductors

On multi-grounded circuits, as defined in IEEE C2, provide a single continuous vertical grounding electrode conductor. Neutrals, surge arresters, and equipment grounding conductors shall be bonded to this conductor. For single grounded or ungrounded systems, provide a grounding conductor for the surge arrester and equipment grounding conductors and a separate grounding conductor for the secondary neutrals. Grounding electrode conductors shall be sized as shown. Secondary system neutral conductors shall be connected directly to the transformer neutral bushings, then connected with a neutral bonding jumper between the transformer neutral bushing and the vertical grounding electrode conductor, as shown. Grounding electrode conductors shall be stapled to wood poles at intervals not exceeding 2 feet. On metal poles, a preformed galvanized steel strap, 5/8 inch wide by 22 gauge minimum by length, secured by a preformed locking method standard with the manufacturer, shall be used to support a grounding electrode conductor installation on the pole and spaced at intervals not exceeding 5 feet with one band not more than 3 inches from each end of the vertical grounding electrode conductor. Bends greater than 45 degrees in grounding electrode conductor are not permitted.

3.11 FIELD TESTING

3.11.1 General

Field testing shall be performed in the presence of the Contracting Officer. The Contractor shall notify the Contracting Officer 15 days prior to conducting tests. The Contractor shall furnish materials, labor, and equipment necessary to conduct field tests. The Contractor shall perform tests and inspections recommended by the manufacturer unless specifically waived by the Contracting Officer. The Contractor shall maintain a written record of tests which includes date, test performed, personnel involved, devices tested, serial number and name of test equipment, and test results. Field reports will be signed and dated by the Contractor.

3.11.2 Safety

The Contractor shall provide and use safety devices such as rubber gloves, protective barriers, and danger signs to protect and warn

personnel in the test vicinity. The Contractor shall replace any devices or equipment which are damaged due to improper test procedures or handling.

3.11.3 Ground-Resistance Tests

The resistance of each pole ground shall be measured using the fall-of-potential method defined in IEEE Std 81. Ground resistance measurements shall be made before the electrical distribution system is energized and shall be made in normally dry conditions not less than 48 hours after the last rainfall. Resistance measurements of separate grounding electrode systems shall be made before the systems are bonded together below grade. The combined resistance of separate systems may be used to meet the required resistance, but the specified number of electrodes shall be provided.

3.11.4 Sag and Tension Test

The Contracting Officer shall be given prior notice of the time schedule for stringing conductors or cables serving overhead medium-voltage circuits and reserves the right to witness the procedures used for ascertaining that initial stringing sags and tensions are in compliance with requirements for the applicable loading district and cable weight.

3.11.5 Operating Tests

After the installation is completed, and at such time as the Contracting Officer may direct, the Contractor shall conduct operating tests for approval. The equipment shall be demonstrated to operate in accordance with the specified requirements. An operating test report shall be submitted in accordance with paragraph SUBMITTALS.

3.12 ACCEPTANCE

Final acceptance of the facility will not be given until the Contractor has successfully completed all tests and after all defects in installation, material or operation have been corrected.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 16 - ELECTRICAL

SECTION 16375

ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND

PART 1 GENERAL

1.1 REFERENCES
1.2 GENERAL REQUIREMENTS
1.2.1 Terminology
1.2.2 Service Conditions
1.3 SUBMITTALS
1.4 DELIVERY, STORAGE, AND HANDLING

PART 2 PRODUCTS

2.1 STANDARD PRODUCT
2.2 NAMEPLATES
2.2.1 General
2.2.2 Liquid-Filled Transformer Nameplates
2.3 CORROSION PROTECTION
2.3.1 Aluminum Materials
2.3.2 Ferrous Metal Materials
2.3.2.1 Hardware
2.3.2.2 Equipment
2.3.3 Finishing
2.4 CABLES
2.4.1 Low-Voltage Cables
2.4.1.1 Conductor Material
2.4.1.2 Insulation
2.4.1.3 Jackets
2.4.1.4 In Duct
2.5 CABLE JOINTS, TERMINATIONS, AND CONNECTORS
2.5.1 Low-Voltage Cable Splices
2.5.2 Terminations
2.5.2.1 Factory Preformed Type
2.5.2.2 Taped Terminations
2.6 CONDUIT AND DUCTS
2.6.1 Metallic Conduit
2.6.2 Nonmetallic Ducts
2.6.2.1 Direct Burial
2.6.3 Conduit Sealing Compound
2.7 GROUNDING AND BONDING
2.7.1 Grounding Conductors
2.8 LIQUID DIELECTRICS
2.9 FACTORY TESTS

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS
3.1.1 Cable Installer Qualifications

3.1.2 Conformance to Codes
3.1.3 Verification of Dimensions
3.2 CABLE INSTALLATION
3.2.1 Duct Line
3.3 DUCT LINES
3.3.1 Nonencased Direct-Burial
3.3.2 Installation of Couplings
3.3.3 Duct Line Markers
3.4 CONNECTIONS BETWEEN AERIAL AND UNDERGROUND SYSTEMS
3.4.1 Pole Installation
3.5 CONNECTIONS TO BUILDINGS
3.6 GROUNDING
3.6.1 Grounding Electrodes
3.6.2 Grounding and Bonding Connections
3.6.3 Grounding and Bonding Conductors
3.6.4 Surge Arrester Grounding
3.6.5 Riser Pole Grounding
3.7 FIELD TESTING
3.7.1 General
3.7.2 Safety
3.7.3 Ground-Resistance Tests
3.8 ACCEPTANCE

-- End of Section Table of Contents --

SECTION 16375

ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C119.1	(1986; R 1997) Sealed Insulated Underground Connector Systems Rated 600 Volts
ANSI C80.1	(1995) Rigid Steel Conduit - Zinc Coated
ANSI O5.1	(1992) Specifications and Dimensions for Wood Poles

ASTM INTERNATIONAL (ASTM)

ASTM A 123/A 123M	(2001a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 153/A 153M	(2001a) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM B 117	(1997) Operating Salt Spray (Fog) Apparatus
ASTM B 3	(1995) Soft or Annealed Copper Wire
ASTM B 8	(1999) Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM D 1654	(1992; R 2000) Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
ASTM D 4059	(2000) Analysis of Polychlorinated Biphenyls in Insulating Liquids by Gas Chromatography
ASTM D 923	(1997) Sampling Electrical Insulating Liquids

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C2	(2002) National Electrical Safety Code
IEEE C57.12.00	(2000) General Requirements for

	Liquid-Immersed Distribution, Power, and Regulating Transformers
IEEE Std 100	(2000) IEEE Standard Dictionary of Electrical and Electronics Terms
IEEE Std 48	(1998) Standard Test Procedures and Requirements for Alternating-Current Cable Terminations 2.5 kV through 765 kV
IEEE Std 81	(1983) Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System (Part 1)

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA FB 1	(1993) Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies
NEMA TC 6	(1990) PVC and ABS Plastic Utilities Duct for Underground Installation

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2002) National Electrical Code

UNDERWRITERS LABORATORIES (UL)

UL 467	(1993; Rev thru Feb 2001) Grounding and Bonding Equipment
UL 486A	(1997; Rev thru May 2001) Wire Connectors and Soldering Lugs for Use with Copper Conductors
UL 486B	(1997; Rev thru May 2001) Wire Connectors for Use with Aluminum Conductors
UL 514A	(1996; Rev Dec 1999) Metallic Outlet Boxes
UL 6	(1997) Rigid Metal Conduit
UL 651	(1995; Rev thru Oct 1998) Schedule 40 and 80 Rigid PVC Conduit

1.2 GENERAL REQUIREMENTS

1.2.1 Terminology

Terminology used in this specification is as defined in IEEE Std 100.

1.2.2 Service Conditions

Items provided under this section shall be specifically suitable for the following service conditions. Seismic details shall conform to Sections 16070 SEISMIC PROTECTION FOR ELECTRICAL EQUIPMENT.

c. Ambient Temperature -50 degrees F to 100 degrees F

f. Seismic Parameters Design category per Section 13080

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Electrical Distribution System; G.

Detail drawings consisting of equipment drawings, illustrations, schedules, instructions, diagrams manufacturers standard installation drawings and other information necessary to define the installation and enable the Government to check conformity with the requirements of the contract drawings.

If departures from the contract drawings are deemed necessary by the Contractor, complete details of such departures shall be included with the detail drawings. Approved departures shall be made at no additional cost to the Government.

Detail drawings shall show how components are assembled, function together and how they will be installed on the project. Data and drawings for component parts of an item or system shall be coordinated and submitted as a unit. Data and drawings shall be coordinated and included in a single submission. Multiple submissions for the same equipment or system are not acceptable except where prior approval has been obtained from the Contracting Officer. In such cases, a list of data to be submitted later shall be included with the first submission. Detail drawings shall consist of the following:

a. Detail drawings showing physical arrangement, construction details, connections, finishes, materials used in fabrication, provisions for conduit or busway entrance, access requirements for installation and maintenance, physical size, electrical characteristics, foundation and support details, and equipment weight. Drawings shall be drawn to scale and/or dimensioned. All optional items shall be clearly identified as included or excluded.

b. External wiring connections shall be clearly identified.

Detail drawings shall as a minimum depict the installation of the following items:

Nameplates;

Catalog cuts, brochures, circulars, specifications, product data, and printed information in sufficient detail and scope to verify compliance with the requirements of the contract documents.

Material and Equipment;

A complete itemized listing of equipment and materials proposed for incorporation into the work. Each entry shall include an item number, the quantity of items proposed, and the name of the manufacturer of each such item.

SD-06 Test Reports; G

Field Testing; G

General Installation Requirements;

SD-07 Certificates

Material and Equipment;

Where materials or equipment are specified to conform to the standards of the Underwriters Laboratories (UL) or to be constructed or tested, or both, in accordance with the standards of the American National Standards Institute (ANSI), the Institute of Electrical and Electronics Engineers (IEEE), or the National Electrical Manufacturers Association (NEMA), the Contractor shall submit proof that the items provided conform to such requirements. The label of, or listing by, UL will be acceptable as evidence that the items conform. Either a certification or a published catalog specification data statement, to the effect that the item is in accordance with the referenced ANSI or IEEE standard, will be acceptable as evidence that the item conforms. A similar certification or published catalog specification data statement to the effect that the item is in accordance with the referenced NEMA standard, by a company listed as a member company of NEMA, will be acceptable as evidence that the item conforms. In lieu of such certification or published data, the Contractor may submit a certificate from a recognized testing agency equipped and competent to perform such services, stating that the items have been tested and that they conform to the requirements listed, including methods of testing of the specified agencies. Compliance with above-named requirements does not relieve the Contractor from compliance with any other requirements of the specifications.

Cable Installer Qualifications;

1.4 DELIVERY, STORAGE, AND HANDLING

Devices and equipment shall be visually inspected by the Contractor when received and prior to acceptance from conveyance. Stored items shall be protected from the environment in accordance with the manufacturer's published instructions. Damaged items shall be replaced. Oil filled transformers and switches shall be stored in accordance with the manufacturer's requirements. Wood poles held in storage for more than 2 weeks shall be stored in accordance with ANSI O5.1. Handling of wood poles shall be in accordance with ANSI O5.1, except that pointed tools capable of producing indentations more than 1 inch in depth shall not be used. Metal poles shall be handled and stored in accordance with the manufacturer's instructions.

PART 2 PRODUCTS

2.1 STANDARD PRODUCT

Material and equipment shall be the standard product of a manufacturer regularly engaged in the manufacture of the product and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. Items of the same classification shall be identical including equipment, assemblies, parts, and components.

2.2 NAMEPLATES

2.2.1 General

Each major component of this specification shall have the manufacturer's name, address, type or style, model or serial number, and catalog number on a nameplate securely attached to the equipment. Nameplates shall be made of noncorrosive metal. Equipment containing liquid dielectrics shall have the type of dielectric on the nameplate. Sectionalizer switch nameplates shall have a schematic with all switch positions shown and labeled. As a minimum, nameplates shall be provided for transformers, circuit breakers, meters, switches, and switchgear.

2.2.2 Liquid-Filled Transformer Nameplates

Power transformers shall be provided with nameplate information in accordance with IEEE C57.12.00. Nameplates shall indicate the number of gallons and composition of liquid-dielectric, and shall be permanently marked with a statement that the transformer dielectric to be supplied is non-polychlorinated biphenyl. If transformer nameplate is not so marked, the Contractor shall furnish manufacturer's certification for each transformer that the dielectric is non-PCB classified, with less than 2 ppm PCB content in accordance with paragraph LIQUID DIELECTRICS. Certifications shall be related to serial numbers on transformer nameplates. Transformer dielectric exceeding the 2 ppm PCB content or transformers without certification will be considered as PCB insulated and will not be accepted.

2.3 CORROSION PROTECTION

2.3.1 Aluminum Materials

Aluminum shall not be used in contact with earth or concrete. Where aluminum conductors are connected to dissimilar metal, fittings conforming to UL 486B shall be used.

2.3.2 Ferrous Metal Materials

2.3.2.1 Hardware

Ferrous metal hardware shall be hot-dip galvanized in accordance with ASTM A 153/A 153M and ASTM A 123/A 123M.

2.3.2.2 Equipment

Equipment and component items, including but not limited to transformer stations and ferrous metal luminaries not hot-dip galvanized or porcelain enamel finished, shall be provided with corrosion-resistant

finishes which shall withstand 120 hours of exposure to the salt spray test specified in ASTM B 117 without loss of paint or release of adhesion of the paint primer coat to the metal surface in excess of 1/16 inch from the test mark. The scribed test mark and test evaluation shall be in accordance with ASTM D 1654 with a rating of not less than 7 in accordance with TABLE 1, (procedure A). Cut edges or otherwise damaged surfaces of hot-dip galvanized sheet steel or mill galvanized sheet steel shall be coated with a zinc rich paint conforming to the manufacturer's standard.

2.3.3 Finishing

Painting required for surfaces not otherwise specified and finish painting of items only primed at the factory shall be as specified in Section 09900 PAINTS AND COATINGS.

2.4 CABLES

Cables shall be single conductor type unless otherwise indicated.

2.4.1 Low-Voltage Cables

Cables shall be rated 600 volts and shall conform to the requirements of NFPA 70, and must be UL listed for the application or meet the applicable section of either ICEA or NEMA standards.

2.4.1.1 Conductor Material

Underground cables shall be annealed copper complying with ASTM B 3 and ASTM B 8. Intermixing of copper and aluminum conductors is not permitted.

2.4.1.2 Insulation

Insulation must be in accordance with NFPA 70, and must be UL listed for the application or meet the applicable sections of either ICEA, or NEMA standards.

2.4.1.3 Jackets

Multiconductor cables shall have an overall outer jacket.

2.4.1.4 In Duct

Cables shall be single-conductor cable, in accordance with NFPA 70. .

2.5 CABLE JOINTS, TERMINATIONS, AND CONNECTORS

2.5.1 Low-Voltage Cable Splices

Low-voltage cable splices and terminations shall be rated at not less than 600 Volts. Splices in conductors No. 10 AWG and smaller shall be made with an insulated, solderless, pressure type connector, conforming to the applicable requirements of UL 486A. Splices in conductors No. 8 AWG and larger shall be made with noninsulated, solderless, pressure type connector, conforming to the applicable requirements of UL 486A and UL 486B. Splices shall then be covered with an insulation and jacket material equivalent to the conductor insulation and jacket. Splices below grade or in wet locations shall be sealed type conforming to ANSI

C119.1 or shall be waterproofed by a sealant-filled, thick wall, heat shrinkable, thermosetting tubing or by pouring a thermosetting resin into a mold that surrounds the joined conductors.

2.5.2 Terminations

Terminations shall be in accordance with IEEE Std 48, Class 1 or Class 2; of the molded elastomer, wet-process porcelain, prestretched elastomer, heat-shrinkable elastomer, or taped type. Acceptable elastomers are track-resistant silicone rubber or track-resistant ethylene propylene compounds, such as ethylene propylene rubber or ethylene propylene diene monomer. Separable insulated connectors may be used for apparatus terminations, when such apparatus is provided with suitable bushings. Terminations shall be of the outdoor type, except that where installed inside outdoor equipment housings which are sealed against normal infiltration of moisture and outside air, indoor, Class 2 terminations are acceptable. Class 3 terminations are not acceptable. Terminations, where required, shall be provided with mounting brackets suitable for the intended installation and with grounding provisions for the cable shielding, metallic sheath, and armor.

2.5.2.1 Factory Preformed Type

Molded elastomer, wet-process porcelain, prestretched, and heat-shrinkable terminations shall utilize factory preformed components to the maximum extent practicable rather than tape build-up. Terminations shall have basic impulse levels as required for the system voltage level. .

2.5.2.2 Taped Terminations

Taped terminations shall use standard termination kits providing terminal connectors, field-fabricated stress cones, and rain hoods. Terminations shall be at least 25 inches long from the end of the tapered cable jacket to the start of the terminal connector, or not less than the kit manufacturer's recommendations, whichever is greater.

2.6 CONDUIT AND DUCTS

Ducts shall be single, round-bore type, with wall thickness and fittings suitable for the application.

2.6.1 Metallic Conduit

Rigid galvanized steel conduit shall comply with UL 6 and ANSI C80.1. Metallic conduit fittings and outlets shall comply with UL 514A and NEMA FB 1.

2.6.2 Nonmetallic Ducts

2.6.2.1 Direct Burial

UL 651 Schedule 80, or NEMA TC 6 Type DB.

2.6.3 Conduit Sealing Compound

Compounds for sealing ducts and conduit shall have a putty-like consistency workable with the hands at temperatures as low as 35 degrees F, shall neither slump at a temperature of 300 degrees F, nor harden

materially when exposed to the air. Compounds shall adhere to clean surfaces of fiber or plastic ducts; metallic conduits or conduit coatings; concrete, masonry, or lead; any cable sheaths, jackets, covers, or insulation materials; and the common metals. Compounds shall form a seal without dissolving, noticeably changing characteristics, or removing any of the ingredients. Compounds shall have no injurious effect upon the hands of workmen or upon materials.

2.7 GROUNDING AND BONDING

2.7.1 Grounding Conductors

Grounding conductors shall be bare, except where installed in conduit with associated phase conductors. Insulated conductors shall be of the same material as phase conductors and green color-coded, except that conductors shall be rated no more than 600 volts. Bare conductors shall be ASTM B 8 soft-drawn unless otherwise indicated. Aluminum is not acceptable.

2.8 LIQUID DIELECTRICS

Liquid dielectrics for transformers, capacitors, reclosers, and other liquid-filled electrical equipment shall be non-polychlorinated biphenyl (PCB) mineral-oil or less-flammable liquid as specified. Nonflammable fluids shall not be used. Tetrachloroethylene (perchloroethylene) and 1, 2, 4 trichlorobenzene fluids shall not be used. Liquid dielectrics in retrofitted equipment shall be certified by the manufacturer as having less than 2 parts per million (ppm) PCB content. In lieu of the manufacturer's certification, the Contractor may submit a test sample of the dielectric in accordance with ASTM D 923 and have tests performed per ASTM D 4059 at a testing facility approved by the Contracting Officer. Equipment with test results indicating PCB level exceeding 2 ppm shall be replaced.

2.9 FACTORY TESTS

Factory tests shall be performed, as follows, in accordance with the applicable publications and with other requirements of these specifications. The Contracting Officer shall be notified at least 10 days before the equipment is ready for testing. The Contracting Officer reserves the right to witness the tests.

a. Transformers: Manufacturer's standard routine tests in accordance with IEEE C57.12.00.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

Equipment and devices shall be installed and energized in accordance with the manufacturer's published instructions. Circuits installed aerially shall conform to the requirements of Section 16370 ELECTRICAL DISTRIBUTION SYSTEM, AERIAL. Steel conduits installed underground shall be installed and protected from corrosion in conformance with the requirements of Section 16415 ELECTRICAL WORK, INTERIOR. Concrete work shall have minimum 3000 psi compressive strength and conform to the requirements of Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

3.1.1 Cable Installer Qualifications

The Contractor shall provide at least one onsite person in a supervisory position with a documentable level of competency and experience to supervise all cable pulling operations.

3.1.2 Conformance to Codes

The installation shall comply with the requirements and recommendations of NFPA 70 and IEEE C2 as applicable.

3.1.3 Verification of Dimensions

The Contractor shall become familiar with details of the work, shall verify dimensions in the field, and shall advise the Contracting Officer of any discrepancy before performing any work.

3.2 CABLE INSTALLATION

3.2.1 Duct Line

Low-voltage cables shall be installed in duct lines where indicated. Neutral and grounding conductors shall be installed in the same duct with their associated phase conductors.

3.3 DUCT LINES

3.3.1 Nonencased Direct-Burial

Top of duct lines shall be but not less than 24 inches below finished grade and shall be installed with a minimum of 3 inches of earth around each duct, except that between adjacent electric power and communication ducts, 12 inches of earth is required. Where bottoms of trenches comprise materials other than sand, a 3 inch layer of sand shall be laid first and compacted to approximate densities of surrounding firm soil before installing ducts. Joints in adjacent tiers of duct shall be vertically staggered at least 6 inches. The first 6 inch layer of backfill cover shall be sand compacted as previously specified. The rest of the excavation shall be backfilled and compacted in3 to 6 inch layers.

3.3.2 Installation of Couplings

Joints in each type of duct shall be made up in accordance with the manufacturer's recommendations for the particular type of duct and coupling selected and as approved.

3.3.3 Duct Line Markers

Duct line markers shall be provided . In addition to markers, a 5 mil brightly colored plastic tape, not less than 3 inches in width and suitably inscribed at not more than 10 feet on centers with a continuous metallic backing and a corrosion-resistant 1 mil metallic foil core to permit easy location of the duct line, shall be placed approximately 12 inches below finished grade levels of such lines.

3.4 CONNECTIONS BETWEEN AERIAL AND UNDERGROUND SYSTEMS

Connections between aerial and underground systems shall be made as shown. Underground cables shall be extended up poles in conduit to

cable terminations. Conduits shall be secured to the poles by 2-hole galvanized steel pipe straps spaced not more than 10 feet apart and with 1 strap not more than 12 inches from any bend or termination. Cable guards shall be secured to poles in accordance with the manufacturer's published procedures. Conduits shall be equipped with bushings to protect cables and minimize water entry. Capnut potheads shall be used to terminate medium-voltage multiple-conductor cable. Cables shall be supported by devices separate from the conduit or guard, near their point of exit from the conduit or guard.

3.4.1 Pole Installation

Pole installation shall be in accordance with Section 16370 ELECTRICAL DISTRIBUTION SYSTEM, AERIAL.

3.5 CONNECTIONS TO BUILDINGS

Cables shall be extended into the various buildings as indicated, and shall be connected to the first applicable termination point in each building. After installation of cables, conduits shall be sealed with caulking compound to prevent entrance of moisture or gases into buildings.

3.6 GROUNDING

Equipment frames of metal-enclosed equipment, and other noncurrent-carrying metal parts, such as cable shields, cable sheaths and armor, and metallic conduit shall be grounded. At least 1 connection shall be provided from a transformer, to the ground. Metallic frames and covers of handholes and pull boxes shall be grounded by use of a braided, copper ground strap with equivalent ampacity of No. 6 AWG.

3.6.1 Grounding Electrodes

Grounding electrodes shall be installed as shown on the drawings and as follows:

a. Driven rod electrodes - Unless otherwise indicated, ground rods shall be driven into the earth until the tops of the rods are approximately 1 foot below finished grade.

d. Additional electrodes - When the required ground resistance is not met, additional electrodes shall be provided interconnected with grounding conductors to achieve the specified ground resistance. The additional electrodes will be up to three,8 feet rods spaced a minimum of 10 feet apart. In high ground resistance, UL listed chemically charged ground rods may be used. If the resultant resistance exceeds 25 ohms measured not less than 48 hours after rainfall, the Contracting Officer shall be notified immediately.

3.6.2 Grounding and Bonding Connections

Connections above grade shall be made by the fusion-welding process or with bolted solderless connectors, in compliance with UL 467, and those below grade shall be made by a fusion-welding process. Where grounding conductors are connected to aluminum-composition conductors, specially treated or lined copper-to-aluminum connectors suitable for this purpose

shall be used.

3.6.3 Grounding and Bonding Conductors

Grounding and bonding conductors include conductors used to bond transformer enclosures and equipment frames to the grounding electrode system. Grounding and bonding conductors shall be sized as shown, and located to provide maximum physical protection. Bends greater than 45 degrees in ground conductors are not permitted. Routing of ground conductors through concrete shall be avoided. When concrete penetration is necessary, nonmetallic conduit shall be cast flush with the points of concrete entrance and exit so as to provide an opening for the ground conductor, and the opening shall be sealed with a suitable compound after installation.

3.6.4 Surge Arrester Grounding

Surge arresters and neutrals shall be bonded directly to the transformer enclosure and then to the grounding electrode system with a bare copper conductor, sized as shown. Lead lengths shall be kept as short as practicable with no kinks or sharp bends.

3.6.5 Riser Pole Grounding

A single continuous vertical grounding electrode conductor shall be installed on each riser pole and connected directly to the grounding electrodes indicated on the drawings or required by these specifications. All equipment, neutrals, surge arresters, and items required to be grounded shall be connected directly to this vertical conductor. The grounding electrode conductor shall be sized as shown. Grounding electrode conductors shall be stapled to wood poles at intervals not exceeding2 feet.

3.7 FIELD TESTING

3.7.1 General

Field testing shall be performed in the presence of the Contracting Officer. The Contractor shall notify the Contracting Officer 7 days prior to conducting tests. The Contractor shall furnish all materials, labor, and equipment necessary to conduct field tests. The Contractor shall perform all tests and inspections recommended by the manufacturer unless specifically waived by the Contracting Officer. The Contractor shall maintain a written record of all tests which includes date, test performed, personnel involved, devices tested, serial number and name of test equipment, and test results. Field test reports shall be signed and dated by the Contractor.

3.7.2 Safety

The Contractor shall provide and use safety devices such as rubber gloves, protective barriers, and danger signs to protect and warn personnel in the test vicinity. The Contractor shall replace any devices or equipment which are damaged due to improper test procedures or handling.

3.7.3 Ground-Resistance Tests

The resistance of each grounding electrode system shall be measured

using the fall-of-potential method defined in IEEE Std 81. Ground resistance measurements shall be made before the Electrical Distribution System is energized and shall be made in normally dry conditions not less than 48 hours after the last rainfall. Resistance measurements of separate grounding electrode systems shall be made before the systems are bonded together below grade. The combined resistance of separate systems may be used to meet the required resistance, but the specified number of electrodes must still be provided.

a. Single rod electrode - 25 ohms.

3.8 ACCEPTANCE

Final acceptance of the facility will not be given until the Contractor has successfully completed all tests and after all defects in installation, material or operation have been corrected.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 16 - ELECTRICAL

SECTION 16415

ELECTRICAL WORK, INTERIOR

PART 1 GENERAL

1.1 REFERENCES
1.2 GENERAL
1.2.1 Rules
1.2.2 Coordination
1.2.3 Special Environments
1.2.3.1 Weatherproof Locations
1.2.4 Standard Products
1.2.5 Nameplates
1.2.5.1 Identification Nameplates
1.3 SUBMITTALS
1.4 WORKMANSHIP
1.5 SEISMIC REQUIREMENTS

PART 2 PRODUCTS

2.1 CABLES AND WIRES
2.1.1 Equipment Manufacturer Requirements
2.1.2 Aluminum Conductors
2.1.3 Insulation
2.1.4 Bonding Conductors
2.2 CIRCUIT BREAKERS
2.2.1 MOLDED-CASE CIRCUIT BREAKERS
2.2.1.1 Construction
2.2.1.2 Ratings
2.3 CONDUIT AND TUBING
2.3.1 Rigid Metal Conduit
2.3.2 Rigid Plastic Conduit
2.4 CONDUIT AND DEVICE BOXES AND FITTINGS
2.4.1 Boxes, Metallic Outlet
2.4.2 Boxes, Nonmetallic, Outlet and Flush-Device Boxes and Covers
2.4.3 Boxes, Switch (Enclosed), Surface-Mounted
2.4.4 Fittings for Conduit and Outlet Boxes
2.4.5 Fittings, PVC, for Use with Rigid PVC Conduit and Tubing
2.5 CONNECTORS, WIRE PRESSURE
2.5.1 For Use With Copper Conductors
2.6 ELECTRICAL GROUNDING AND BONDING EQUIPMENT
2.7 ENCLOSURES
2.7.1 Cabinets and Boxes
2.7.2 Circuit Breaker Enclosures
2.8 LIGHTING FIXTURES, LAMPS, AND ACCESSORIES
2.8.1 Lamps
2.8.2 Fixtures
2.8.3 Lampholders, Starters, and Starter Holders
2.9 PANELBOARDS

2.10 RECEPTACLES
2.10.1 Ground Fault Interrupters
2.10.2 NEMA Standard Receptacle Configurations
2.11 Service Entrance Equipment
2.12 SPLICE, CONDUCTOR
2.13 SNAP SWITCHES
2.14 TAPES
2.14.1 Plastic Tape
2.14.2 Rubber Tape
2.15 WIRING DEVICES

PART 3 EXECUTION

3.1 GROUNDING
3.1.1 Grounding Conductors
3.2 WIRING METHODS
3.2.1 Conduit and Tubing Systems
3.2.1.1 Pull Wires
3.2.1.2 Below Slab-on-Grade or in the Ground
3.2.1.3 Changes in Direction of Runs
3.2.1.4 Supports
3.2.1.5 Exposed Raceways
3.2.1.6 Communications Raceways
3.2.2 Cables and Conductors
3.2.2.1 Sizing
3.2.2.2 Use of Aluminum Conductors in Lieu of Copper
3.2.2.3 Cable Splicing
3.2.2.4 Conductor Identification and Tagging
3.3 BOXES AND SUPPORTS
3.3.1 Box Applications
3.3.2 Brackets and Fasteners
3.3.3 Mounting in Walls, Ceilings, or Recessed Locations
3.4 DEVICE PLATES
3.5 RECEPTACLES
3.5.1 Duplex 20-ampere, 125 volt
3.5.2 Weatherproof Applications
3.5.2.1 Wet Locations
3.6 WALL SWITCHES
3.7 SERVICE EQUIPMENT
3.8 LOADCENTERS
3.8.1 Loadcenters
3.9 AERIAL SERVICE
3.10 LIGHTING FIXTURES, LAMPS
3.10.1 Lamps
3.10.2 Lighting Fixtures
3.10.2.1 Accessories
3.11 EQUIPMENT CONNECTIONS
3.12 REPAIR OF EXISTING WORK
3.13 Safety
3.14 ACCEPTANCE

-- End of Section Table of Contents --

j8u

SECTION 16415

ELECTRICAL WORK, INTERIOR

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C78.20	(1995) Electric Lamps - Characteristics of Incandescent Lamps A, G, PS, and Similar Shapes with E26 Medium Screw Bases
ANSI C78.21	(1995) Physical and Electrical Characteristics - Incandescent Lamps - PAR and R Shapes

ASTM INTERNATIONAL (ASTM)

ASTM B 1	(2001) Hard-Drawn Copper Wire
ASTM B 8	(1999) Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM D 709	(2000) Laminated Thermosetting Materials

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C2	(2002) National Electrical Safety Code

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA 250	(1997) Enclosures for Electrical Equipment (1000 Volts Maximum)
NEMA AB 1	(1993) Molded Case Circuit Breakers and Molded Case Switches
NEMA ICS 6	(1993) Industrial Control and Systems, Enclosures
NEMA OS 1	(1996) Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports
NEMA OS 2	(1998) Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports
NEMA PB 1	(1995) Panelboards

NEMA TC 2	(1998) Electrical Polyvinyl Chloride (PVC) Tubing (EPT) and Conduit (EPC-40 and EPC-80)
NEMA WD 1	(1999) General Requirements for Wiring Devices
NEMA WD 6	(1997) Wiring Devices - Dimensional Requirements

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 101	(2000) Life Safety Code
NFPA 70	(2002) National Electrical Code

UNDERWRITERS LABORATORIES (UL)

UL 1571	(1995; Rev thru Nov 1999) Incandescent Lighting Fixtures
UL 20	(1995; Rev thru Oct 1998) General-Use Snap Switches
UL 467	(1993; Rev thru Feb 2001) Grounding and Bonding Equipment
UL 486A	(1997; Rev thru May 2001) Wire Connectors and Soldering Lugs for Use with Copper Conductors
UL 486C	(1997; Rev thru Aug 1998) Splicing Wire Connectors
UL 486E	(1994; Rev thru Feb 1997) Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors
UL 489	(1996; Rev thru Dec 1998) Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures
UL 50	(1995; Rev thru Nov 1999) Enclosures for Electrical Equipment
UL 510	(1994; Rev thru Apr 1998) Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape
UL 514A	(1996; Rev Dec 1999) Metallic Outlet Boxes
UL 514B	(1997; Rev Oct 1998) Fittings for Cable and Conduit
UL 514C	(1996; Rev thru Dec 1999) Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
UL 542	(1999) Lampholders, Starters, and Starter

	Holders for Fluorescent Lamps
UL 6	(1997) Rigid Metal Conduit
UL 651	(1995; Rev thru Oct 1998) Schedule 40 and 80 Rigid PVC Conduit
UL 651A	(1995; Rev thru Apr 1998) Type EB and A Rigid PVC Conduit and HDPE Conduit
UL 67	(1993; Rev thru Oct 1999) Panelboards
UL 83	(1998; Rev thru Sep 1999) Thermoplastic-Insulated Wires and Cables
UL 844	(1995; Rev thru Mar 1999) Electric Lighting Fixtures for Use in Hazardous (Classified) Locations
UL 869A	(1998) Reference Standard for Service Equipment
UL 877	(1993; Rev thru Nov 1999) Circuit Breakers and Circuit-Breaker Enclosures for Use in Hazardous (Classified) Locations
UL 943	(1993; Rev thru May 1998) Ground-Fault Circuit-Interrupters
UL 98	(1994; Rev thru Jun 1998) Enclosed and Dead-Front Switches
UL Elec Const Dir	(1999) Electrical Construction Equipment Directory

1.2 GENERAL

1.2.1 Rules

The installation shall conform to the requirements of NFPA 70 and NFPA 101, unless more stringent requirements are indicated or shown.

1.2.2 Coordination

The drawings indicate the extent and the general location and arrangement of equipment, conduit, and wiring. The Contractor shall become familiar with all details of the work and verify all dimensions in the field so that the outlets and equipment shall be properly located and readily accessible. Lighting fixtures, outlets, and other equipment and materials shall be carefully coordinated with mechanical or structural features prior to installation and positioned according to architectural reflected ceiling plans; otherwise, lighting fixtures shall be symmetrically located according to the room arrangement when uniform illumination is required, or asymmetrically located to suit conditions fixed by design and shown. Raceways, junction and outlet boxes, and lighting fixtures shall not be supported from sheet metal roof decks. If any conflicts occur necessitating departures from the

drawings, details of and reasons for departures shall be submitted and approved prior to implementing any change. The Contractor shall coordinate the electrical requirements of the mechanical work and provide all power related circuits, wiring, hardware and structural support, even if not shown on the drawings.

1.2.3 Special Environments

1.2.3.1 Weatherproof Locations

Wiring, Fixtures, and equipment in designated locations shall conform to NFPA 70 requirements for installation in damp or wet locations.

1.2.4 Standard Products

Material and equipment shall be a standard product of a manufacturer regularly engaged in the manufacture of the product and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening.

1.2.5 Nameplates

1.2.5.1 Identification Nameplates

Major items of electrical equipment and major components shall be permanently marked with an identification name to identify the equipment by type or function and specific unit number as indicated. Designation of motors shall coincide with their designation in the motor control center or panel. Unless otherwise specified, identification nameplates shall be made of laminated plastic in accordance with ASTM D 709 with black outer layers and a white core. Edges shall be chamfered. Plates shall be fastened with black-finished round-head drive screws, except motors, or approved nonadhesive metal fasteners. When the nameplate is to be installed on an irregular-shaped object, the Contractor shall devise an approved support suitable for the application and ensure the proper installation of the supports and nameplates. In all instances, the nameplate shall be installed in a conspicuous location. At the option of the Contractor, the equipment manufacturer's standard embossed nameplate material with black paint-filled letters may be furnished in lieu of laminated plastic. The front of each panelboard, motor control center, switchgear, and switchboard shall have a nameplate to indicate the phase letter, corresponding color and arrangement of the phase conductors. The following equipment, as a minimum, shall be provided with identification nameplates:

Minimum 1/4 inch
High Letters

Panelboards

Safety Switches
Equipment Enclosures

Each panel, section, or unit in motor control centers, switchgear or similar assemblies shall be provided with a nameplate in addition to nameplates listed above, which shall be provided for individual compartments in the respective assembly, including nameplates which identify "future," "spare," and "dedicated" or "equipped spaces."

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Interior Electrical Equipment; G.

Detail drawings consisting of equipment drawings, illustrations, schedules, instructions, diagrams, and other information necessary to define the installation. Detail drawings shall show the rating of items and systems and how the components of an item and system are assembled, function together, and how they will be installed on the project. Data and drawings for component parts of an item or system shall be coordinated and submitted as a unit. Data and drawings shall be coordinated and included in a single submission. Multiple submissions for the same equipment or system are not acceptable except where prior approval has been obtained from the Contracting Officer. In such cases, a list of data to be submitted later shall be included with the first submission. Detail drawings shall show physical arrangement, construction details, connections, finishes, materials used in fabrication, provisions for conduit or busway entrance, access requirements for installation and maintenance, physical size, electrical characteristics, foundation and support details, and equipment weight. Drawings shall be drawn to scale and/or dimensioned. Optional items shall be clearly identified as included or excluded. Detail drawings shall as a minimum include:

a. Light fixtures.

b. Light switches

c. Junction and pull boxes

d. Conduit

e. Weatherproof receptacle covers and boxes

f. Receptacles

If departures from the contract drawings are deemed necessary by the Contractor, complete details of such departures, including changes in related portions of the project and the reasons why, shall be submitted with the detail drawings. Approved departures shall be made at no additional cost to the Government.

SD-03 Product Data

Manufacturer's Catalog;

Data composed of catalog cuts, brochures, circulars,

specifications, product data, and printed information in sufficient detail and scope to verify compliance with the requirements of the contract documents.

Material, Equipment, and Fixture Lists;

A complete itemized listing of equipment and materials proposed for incorporation into the work. Each entry shall include an item number, the quantity of items proposed, and the name of the manufacturer of each item.

SD-07 Certificates

Materials and Equipment;

The label or listing of the Underwriters Laboratories, Inc., will be accepted as evidence that the materials or equipment conform to the applicable standards of that agency. In lieu of this label or listing, a statement from a nationally recognized, adequately equipped testing agency indicating that the items have been tested in accordance with required procedures and that the materials and equipment comply with all contract requirements will be accepted. However, materials and equipment installed in hazardous locations must bear the UL label unless the data submitted from other testing agency is specifically approved in writing by the Contracting Officer. Items which are required to be listed and labeled in accordance with Underwriters Laboratories must be affixed with a UL label that states that it is UL listed. No exceptions or waivers will be granted to this requirement. Materials and equipment will be approved based on the manufacturer's published data.

For other than equipment and materials specified to conform to UL publications, a manufacturer's statement indicating complete compliance with the applicable standard of the American Society for Testing and Materials, National Electrical Manufacturers Association, or other commercial standard, is acceptable.

1.4 WORKMANSHIP

Materials and equipment shall be installed in accordance with NFPA 70, recommendations of the manufacturer, and as shown.

1.5 SEISMIC REQUIREMENTS

Seismic details shall conform to Sections 13280 ASBESTOS ABATEMENT and 16070 SEISMIC PROTECTION FOR ELECTRICAL EQUIPMENT

PART 2 PRODUCTS

Products shall conform to the respective publications and other requirements specified below. Materials and equipment not listed below shall be as specified elsewhere in this section. Items of the same classification shall be identical including equipment, assemblies, parts, and components.

2.1 CABLES AND WIRES

Conductors No. 8 AWG and larger diameter shall be stranded. Conductors

No. 10 AWG and smaller diameter shall be solid, except that conductors for remote control, alarm, and signal circuits, classes 1, 2, and 3, shall be stranded unless specifically indicated otherwise. Conductor sizes and ampacities shown are based on copper, unless indicated otherwise. All conductors shall be copper.

2.1.1 Equipment Manufacturer Requirements

When manufacturer's equipment requires copper conductors at the terminations or requires copper conductors to be provided between components of equipment, provide copper conductors or splices, splice boxes, and other work required to meet manufacturer's requirements.

2.1.2 Aluminum Conductors

Aluminum conductors shall not be used.

2.1.3 Insulation

Unless indicated otherwise, or required by NFPA 70, power and lighting wires shall be 600-volt, Type XHHW, except that grounding wire may be type TW conforming to UL 83; remote-control and signal circuits shall be Type TW, THW or TF, conforming to UL 83. Where lighting fixtures require 90-degree Centigrade (C) conductors, provide only conductors with 90-degree C insulation or better.

2.1.4 Bonding Conductors

ASTM B 1, solid bare copper wire for sizes No. 8 AWG and smaller diameter; ASTM B 8, Class B, stranded bare copper wire for sizes No. 6 AWG and larger diameter.

2.2 CIRCUIT BREAKERS

2.2.1 MOLDED-CASE CIRCUIT BREAKERS

Molded-case circuit breakers shall conform to NEMA AB 1 and UL 489 and UL 877 for circuit breakers and circuit breaker enclosures located in hazardous (classified) locations. Circuit breakers may be installed in panelboards, switchboards, enclosures, motor control centers, or combination motor controllers.

2.2.1.1 Construction

Circuit breakers shall be suitable for mounting and operating in any position. Lug shall be listed for copper and aluminum conductors in accordance with UL 486E. Single-pole circuit breakers shall be full module size with not more than one pole per module. Multi-pole circuit breakers shall be of the common-trip type having a single operating handle such that an overload or short circuit on any one pole will result in all poles opening simultaneously. Sizes of 100 amperes or less may consist of single-pole breakers permanently factory assembled into a multi-pole unit having an internal, mechanical, nontamperable common-trip mechanism and external handle ties. All circuit breakers shall have a quick-make, quick-break overcenter toggle-type mechanism, and the handle mechanism shall be trip-free to prevent holding the contacts closed against a short-circuit or sustained overload. All circuit breaker handles shall assume a position between "ON" and "OFF" when tripped automatically. All ratings shall be clearly visible.

2.2.1.2 Ratings

Voltage ratings shall be not less than the applicable circuit voltage. The interrupting rating of the circuit breakers shall be at least equal to the available short-circuit current at the line terminals of the circuit breaker and correspond to the UL listed integrated short-circuit current rating specified for the panelboards and switchboards. Molded-case circuit breakers shall have nominal voltage ratings, maximum continuous-current ratings, and maximum short-circuit interrupting ratings in accordance with NEMA AB 1. Ratings shall be coordinated with system X/R ratio.

2.3 CONDUIT AND TUBING

2.3.1 Rigid Metal Conduit

UL 6.

2.3.2 Rigid Plastic Conduit

NEMA TC 2, UL 651 and UL 651A.

2.4 CONDUIT AND DEVICE BOXES AND FITTINGS

2.4.1 Boxes, Metallic Outlet

NEMA OS 1 and UL 514A.

2.4.2 Boxes, Nonmetallic, Outlet and Flush-Device Boxes and Covers

NEMA OS 2 and UL 514C.

2.4.3 Boxes, Switch (Enclosed), Surface-Mounted

UL 98.

2.4.4 Fittings for Conduit and Outlet Boxes

UL 514B.

2.4.5 Fittings, PVC, for Use with Rigid PVC Conduit and Tubing

UL 514B.

2.5 CONNECTORS, WIRE PRESSURE

2.5.1 For Use With Copper Conductors

UL 486A.

2.6 ELECTRICAL GROUNDING AND BONDING EQUIPMENT

UL 467.

2.7 ENCLOSURES

NEMA ICS 6 or NEMA 250 unless otherwise specified.

2.7.1 Cabinets and Boxes

Cabinets and boxes with volume greater than 100 cubic inches shall be in accordance with UL 50, hot-dip, zinc-coated, if sheet steel.

2.7.2 Circuit Breaker Enclosures

UL 489.

2.8 LIGHTING FIXTURES, LAMPS, AND ACCESSORIES

The following specifications are supported and supplemented by information and details on the drawings. Additional fixtures, if shown, shall conform to this specification. Lighting equipment installed in classified hazardous locations shall conform to UL 844. Lamps, lampholders, ballasts, transformers, electronic circuitry and other lighting system components shall be constructed according to industry standards. Equipment shall be tested and listed by a recognized independent testing laboratory for the expected installation conditions. Equipment shall conform to the standards listed below.

2.8.1 Lamps

Lamps shall be constructed to operate in the specified fixture, and shall function without derating life or output as listed in published data. Lamps shall meet the requirements of the Energy Policy Act of 1992.

a. Incandescent and tungsten halogen lamps shall be designed for 125 volt operation (except for low voltage lamps), shall be rated for minimum life of 2,000 hours, and shall have color temperature between 2,800 and 3,200 degrees Kelvin. Tungsten halogen lamps shall incorporate quartz capsule construction. Lamps shall comply with ANSI C78.20 and sections 238 and 270 of ANSI C78.21.

2.8.2 Fixtures

Fixtures shall be in accordance with the size, shape, appearance, finish, and performance shown. Unless otherwise indicated, lighting fixtures shall be provided with housings, junction boxes, wiring, lampholders, mounting supports, trim, hardware and accessories for a complete and operable installation.

a. Incandescent fixtures shall comply with UL 1571. Incandescent fixture specular reflector cone trims shall be integral to the cone and shall be finished to match. Painted trim finishes shall be white with minimum reflectance of 88%.

2.8.3 Lampholders, Starters, and Starter Holders

UL 542

2.9 PANELBOARDS

Dead-front construction, NEMA PB 1 and UL 67.

2.10 RECEPTACLES

2.10.1 Ground Fault Interrupters

UL 943, Class A or B.

2.10.2 NEMA Standard Receptacle Configurations

NEMA WD 6.

a. 20-Ampere, 125 Volt

20-ampere, non-locking: NEMA type 5-20R

2.11 Service Entrance Equipment

UL 869A.

2.12 SPLICE, CONDUCTOR

UL 486C.

2.13 SNAP SWITCHES

UL 20.

2.14 TAPES

2.14.1 Plastic Tape

UL 510.

2.14.2 Rubber Tape

UL 510.

2.15 WIRING DEVICES

NEMA WD 1 for wiring devices, and NEMA WD 6 for dimensional requirements of wiring devices.

PART 3 EXECUTION

3.1 GROUNDING

Grounding shall be in conformance with NFPA 70, the contract drawings, and the following specifications.

3.1.1 Grounding Conductors

A green equipment grounding conductor, sized in accordance with NFPA 70 shall be provided, regardless of the type of conduit. Equipment grounding bars shall be provided in all panelboards. The equipment grounding conductor shall be carried back to the service entrance grounding connection or separately derived grounding connection. All equipment grounding conductors, including metallic raceway systems used as such, shall be bonded or joined together in each wiring box or equipment enclosure. Metallic raceways and grounding conductors shall be checked to assure that they are wired or bonded into a common junction. Metallic boxes and enclosures, if used, shall also be bonded to these grounding conductors by an approved means per NFPA 70. When

switches, or other utilization devices are installed, any designated grounding terminal on these devices shall also be bonded to the equipment grounding conductor junction with a short jumper.

3.2 WIRING METHODS

Wiring shall conform to NFPA 70, the contract drawings, and the following specifications. Unless otherwise indicated, wiring shall consist of insulated conductors installed in rigid zinc-coated steel conduit. Where cables and wires are installed in cable trays, they shall be of the type permitted by NFPA 70 for use in such applications.

Wire fill in conduits shall be based on NFPA 70 for the type of conduit and wire insulations specified.

3.2.1 Conduit and Tubing Systems

Conduit and tubing systems shall be installed as indicated. Conduit sizes shown are based on use of copper conductors with insulation types as described in paragraph WIRING METHODS. Minimum size of raceways shall be 1/2 inch. Only metal conduits will be permitted when conduits are required for shielding or other special purposes indicated, or when required by conformance to NFPA 70. Nonmetallic conduit and tubing may be used in damp, wet or corrosive locations when permitted by NFPA 70 and the conduit or tubing system is provided with appropriate boxes, covers, clamps, screws or other appropriate type of fittings. Electrical metallic tubing (EMT) may be installed only within buildings. EMT may be installed in concrete and grout in dry locations. EMT installed in concrete or grout shall be provided with concrete tight fittings. EMT shall not be installed in damp or wet locations, or the air space of exterior masonry cavity walls. Bushings, manufactured fittings or boxes providing equivalent means of protection shall be installed on the ends of all conduits and shall be of the insulating type, where required by NFPA 70. Only UL listed adapters shall be used to connect EMT to rigid metal conduit, cast boxes, and conduit bodies. Aluminum conduit may be used only where installed exposed in dry locations. Nonaluminum sleeves shall be used where aluminum conduit passes through concrete floors and firewalls. Penetrations of above grade floor slabs, time-rated partitions and fire walls shall be firestopped. Except as otherwise specified, IMC may be used as an option for rigid steel conduit in areas as permitted by NFPA 70. Raceways shall not be installed under the firepits of boilers and furnaces and shall be kept 6 inches away from parallel runs of flues, steam pipes and hot-water pipes. Raceways shall be concealed within finished walls, ceilings, and floors unless otherwise shown. Raceways crossing structural expansion joints or seismic joints shall be provided with suitable expansion fittings or other suitable means to compensate for the building expansion and contraction and to provide for continuity of grounding. Wiring installed in shall be suitable for installation in wet locations.

3.2.1.1 Pull Wires

A pull wire shall be inserted in each empty raceway in which wiring is to be installed if the raceway is more than 50 feet in length and contains more than the equivalent of two 90-degree bends, or where the raceway is more than 150 feet in length. The pull wire shall be of No. 14 AWG zinc-coated steel, or of plastic having not less than 200 pounds per square inch tensile strength. Not less than 10 inches of slack shall be left at each end of the pull wire.

3.2.1.2 Below Slab-on-Grade or in the Ground

Electrical wiring below slab-on-grade shall be protected by a conduit system. Conduit passing vertically through slabs-on-grade shall be rigid steel. Rigid steel conduits installed below slab-on-grade or in the earth shall be field wrapped with 0.010 inch thick pipe-wrapping plastic tape applied with a 50 percent overlay, or shall have a factory-applied polyvinyl chloride, plastic resin, or epoxy coating system.

3.2.1.3 Changes in Direction of Runs

Changes in direction of runs shall be made with symmetrical bends or cast-metal fittings. Field-made bends and offsets shall be made with an approved hickey or conduit-bending machine. Crushed or deformed raceways shall not be installed. Trapped raceways in damp and wet locations shall be avoided where possible. Lodgment of plaster, dirt, or trash in raceways, boxes, fittings and equipment shall be prevented during the course of construction. Clogged raceways shall be cleared of obstructions or shall be replaced.

3.2.1.4 Supports

Metallic conduits and tubing,and the support system to which they are attached, shall be securely and rigidly fastened in place to prevent vertical and horizontal movement at intervals of not more than 10 feet and within 3 feet of boxes, cabinets, and fittings, with approved pipe straps, wall brackets, conduit clamps, conduit hangers, threaded C-clamps, beam clamps, or ceiling trapeze. Loads and supports shall be coordinated with supporting structure to prevent damage or deformation to the structure. Loads shall not be applied to joist bridging. Attachment shall be by wood screws or screw-type nails to wood; by toggle bolts on hollow masonry units; by expansion bolts on concrete or brick; by machine screws, welded threaded studs, heat-treated or spring-steel-tension clamps on steel work. Nail-type nylon anchors or threaded studs driven in by a powder charge and provided with lock washers and nuts may be used in lieu of expansion bolts or machine screws. Raceways or pipe straps shall not be welded to steel structures. Cutting the main reinforcing bars in reinforced concrete beams or joists shall be avoided when drilling holes for support anchors. Holes drilled for support anchors, but not used, shall be filled. In partitions of light steel construction, sheet-metal screws may be used. Raceways shall not be supported using wire or nylon ties. Raceways shall be independently supported from the structure. Upper raceways shall not be used as a means of support for lower raceways. Supporting means shall not be shared between electrical raceways and mechanical piping or ducts. Cables and raceways shall not be supported by ceiling grids. Except where permitted by NFPA 70, wiring shall not be supported by ceiling support systems. Conduits shall be fastened to sheet-metal boxes and cabinets with two locknuts where required by NFPA 70, where insulating bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, a single locknut and bushing may be used. Threadless fittings for electrical metallic tubing shall be of a type approved for the conditions encountered. Additional support for horizontal runs is not required when EMT rests on steel stud cutouts.

3.2.1.5 Exposed Raceways

Exposed raceways shall be installed parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings. Raceways under raised floors and above accessible ceilings shall be considered as exposed installations in accordance with NFPA 70 definitions.

3.2.1.6 Communications Raceways

Communications raceways indicated shall be installed in accordance with the previous requirements for conduit and tubing and with the additional requirement that no length of run shall exceed 50 feet for 1/2 inch and 3/4 inch sizes, and 100 feet for 1 inch or larger sizes, and shall not contain more than two 90-degree bends or the equivalent. Additional pull or junction boxes shall be installed to comply with these limitations whether or not indicated. Inside radii of bends in conduits of 1 inch size or larger shall not be less than ten times the nominal diameter.

3.2.2 Cables and Conductors

Installation shall conform to the requirements of NFPA 70. Covered, bare or insulated conductors of circuits rated over 600 volts shall not occupy the same equipment wiring enclosure, cable, or raceway with conductors of circuits rated 600 volts or less.

3.2.2.1 Sizing

Unless otherwise noted, all sizes are based on copper conductors and the insulation types indicated. Sizes shall be not less than indicated. Branch-circuit conductors shall be not smaller than No. 12 AWG. Conductors for branch circuits of 120 volts more than 100 feet long and of 277 volts more than 230 feet long, from panel to load center, shall be no smaller than No. 10 AWG. Class 1 remote control and signal circuit conductors shall be not less than No. 14 AWG. Class 2 remote control and signal circuit conductors shall be not less than No. 16 AWG. Class 3 low-energy, remote-control and signal circuits shall be not less than No. 22 AWG.

3.2.2.2 Use of Aluminum Conductors in Lieu of Copper

Aluminum conductors shall not be used.

3.2.2.3 Cable Splicing

Splices shall be made in an accessible location. Crimping tools and dies shall be approved by the connector manufacturer for use with the type of connector and conductor.

a. Copper Conductors, 600 Volt and Under: Splices in conductors No. 10 AWG and smaller diameter shall be made with an insulated, pressure-type connector. Splices in conductors No. 8 AWG and larger diameter shall be made with a solderless connector and insulated with tape or heat-shrink type insulating material equivalent to the conductor insulation.

3.2.2.4 Conductor Identification and Tagging

Power, control, and signal circuit conductor identification shall be

provided within each enclosure where a tap, splice, or termination is made. Where several feeders pass through a common pull box, the feeders shall be tagged to indicate clearly the electrical characteristics, circuit number, and panel designation. Phase conductors of low voltage power circuits shall be identified by color coding. Phase identification by a particular color shall be maintained continuously for the length of a circuit, including junctions.

a. Color coding shall be provided for service, feeder, branch, and ground conductors. Color shall be green for grounding conductors and white for neutrals; except where neutrals of more than one system are installed in the same raceway or box, other neutral shall be white with colored (not green) stripe. The color coding for 3-phase and single-phase low voltage systems shall be as follows:

   120/208-volt, 3-phase: Black(A), red(B), and blue(C).

   120/240-volt, 1-phase: Black and red.

b. Conductor phase and voltage identification shall be made by color-coded insulation for all conductors smaller than No. 6 AWG. For conductors No. 6 AWG and larger, identification shall be made by color-coded insulation, or conductors with black insulation may be furnished and identified by the use of half-lapped bands of colored electrical tape wrapped around the insulation for a minimum of 3 inches of length near the end, or other method as submitted by the Contractor and approved by the Contracting Officer.

3.3 BOXES AND SUPPORTS

Boxes shall be provided in the wiring or raceway systems where required by NFPA 70 for pulling of wires, making connections, and mounting of devices or fixtures. Pull boxes shall be furnished with screw-fastened covers. Indicated elevations are approximate, except where minimum mounting heights for hazardous areas are required by NFPA 70. Unless otherwise indicated, boxes for wall switches shall be mounted 48 inches above finished floors. Switch and outlet boxes located on opposite sides of fire rated walls shall be separated by a minimum horizontal distance of 24 inches. The total combined area of all box openings in fire rated walls shall not exceed 100 square inches per 100 square feet. Maximum box areas for individual boxes in fire rated walls vary with the manufacturer and shall not exceed the maximum specified for that box in UL Elec Const Dir. Only boxes listed in UL Elec Const Dir shall be used in fire rated walls.

3.3.1 Box Applications

Each box shall have not less than the volume required by NFPA 70 for number of conductors enclosed in box. Boxes for metallic raceways shall be listed for the intended use when located in normally wet locations, when flush or surface mounted on outside of exterior surfaces, or when located in hazardous areas. Boxes installed in wet locations and boxes installed flush with the outside of exterior surfaces shall be gasketed. Boxes for mounting lighting fixtures shall be not less than 4 inches square, or octagonal, except smaller boxes may be installed as required by fixture configuration, as approved. Cast-metal boxes with 3/32 inch wall thickness are acceptable. Large size boxes shall be NEMA 4 or as

shown. Boxes in other locations shall be sheet steel except that aluminum boxes may be used with aluminum conduit, and nonmetallic boxes may be used with nonmetallic conduit and tubing or nonmetallic sheathed cable system, when permitted by NFPA 70. Boxes for use in masonry-block or tile walls shall be square-cornered, tile-type, or standard boxes having square-cornered, tile-type covers.

3.3.2 Brackets and Fasteners

Boxes and supports shall be fastened to wood with wood screws or screw-type nails of equal holding strength, with bolts and metal expansion shields on concrete or brick, with toggle bolts on hollow masonry units, and with machine screw or welded studs on steel work. Threaded studs driven in by powder charge and provided with lockwashers and nuts, or nail-type nylon anchors may be used in lieu of expansion shields, or machine screws. Penetration of more than 1-1/2 inches into reinforced-concrete beams or more than 3/4 inch into reinforced-concrete joists shall avoid cutting any main reinforcing steel. The use of brackets which depend on gypsum wallboard or plasterboard for primary support will not be permitted. In partitions of light steel construction, bar hangers with 1 inch long studs, mounted between metal wall studs or metal box mounting brackets shall be used to secure boxes to the building structure. When metal box mounting brackets are used, additional box support shall be provided on the side of the box opposite the brackets. This additional box support shall consist of a minimum 12 inch long section of wall stud, bracketed to the opposite side of the box and secured by two screws through the wallboard on each side of the stud. Metal screws may be used in lieu of the metal box mounting brackets.

3.3.3 Mounting in Walls, Ceilings, or Recessed Locations

In walls or ceilings of concrete, tile, or other non-combustible material, boxes shall be installed so that the edge of the box is not recessed more than 1/4 inch from the finished surface. Boxes mounted in combustible walls or ceiling material shall be mounted flush with the finished surface. The use of gypsum or plasterboard as a means of supporting boxes will not be permitted. Boxes installed for concealed wiring shall be provided with suitable extension rings or plaster covers, as required. The bottom of boxes installed in masonry-block walls for concealed wiring shall be mounted flush with the top of a block to minimize cutting of the blocks, and boxes shall be located horizontally to avoid cutting webs of block. Separate boxes shall be provided for flush or recessed fixtures when required by the fixture terminal operating temperature, and fixtures shall be readily removable for access to the boxes unless ceiling access panels are provided.

3.4 DEVICE PLATES

One-piece type device plates shall be provided for all outlets and fittings. Plates on unfinished walls and on fittings shall be of zinc-coated sheet steel, cast-metal, or impact resistant plastic having rounded or beveled edges. Plates on finished walls shall be of steel with baked enamel finish or impact-resistant plastic and shall be ivory. Screws shall be of metal with countersunk heads, in a color to match the finish of the plate. Plates shall be installed with all four edges in continuous contact with finished wall surfaces without the use of mats or similar devices. Plaster fillings will not be permitted. Plates shall be installed with an alignment tolerance of 1/16 inch. The use

of sectional-type device plates will not be permitted. Plates installed in wet locations shall be gasketed and provided with a hinged, gasketed cover, unless otherwise specified.

3.5 RECEPTACLES

3.5.1 Duplex 20-ampere, 125 volt

Duplex receptacles shall be rated 20 amperes, 125 volts, two-pole, three-wire, grounding type with polarized parallel slots. Bodies shall be of ivory to match color of switch handles in the same room or to harmonize with the color of the respective wall, and supported by mounting strap having plaster ears. Contact arrangement shall be such that contact is made on two sides of an inserted blade. Receptacle shall be side- or back-wired with two screws per terminal. The third grounding pole shall be connected to the metal mounting yoke. Switched receptacles shall be the same as other receptacles specified except that the ungrounded pole of each suitable receptacle shall be provided with a separate terminal. Only the top receptacle of a duplex receptacle shall be wired for switching application. Receptacles with ground fault circuit interrupters shall have the current rating as indicated, and shall be UL Class A type unless otherwise shown. Ground fault circuit protection shall be provided as required by NFPA 70 and as indicated on the drawings.

3.5.2 Weatherproof Applications

Weatherproof receptacles shall be suitable for the environment, damp or wet as applicable, and the housings shall be labeled to identify the allowable use. Receptacles shall be marked in accordance with UL 514A for the type of use indicated; "Damp locations", "Wet Locations", "Wet Location Only When Cover Closed". Assemblies shall be installed in accordance with the manufacturer's recommendations.

3.5.2.1 Wet Locations

Receptacles in wet locations shall be installed in an assembly rated for such use whether the plug is inserted or withdrawn, unless otherwise indicated. In a duplex installation, the receptacle cover shall be configured to shield the connections whether one or both receptacles are in use. .

3.6 WALL SWITCHES

Wall switches shall be of the totally enclosed tumbler type. The wall switch handle and switch plate color shall be ivory. Wiring terminals shall be of the screw type or of the solderless pressure type having suitable conductor-release arrangement. Not more than two switches shall be installed in a single-gang position. Switches shall be rated 20-ampere 120 -volt for use on alternating current only. Pilot lights indicated shall consist of yoke-mounted candelabra-base sockets rated at 75 watts, 125 volts, and fitted with glass or plastic jewels. A clear 6-watt lamp shall be furnished and installed in each pilot switch. Jewels for use with switches controlling motors shall be green, and jewels for other purposes shall be red. Dimming switches shall be solid-state flush mounted, sized for the loads.

3.7 SERVICE EQUIPMENT

Service-disconnecting means shall be of the fusible safety switch type with an external handle for manual operation. When service disconnecting means is a part of an assembly, the assembly shall be listed as suitable for service entrance equipment. Enclosures shall be sheet metal with hinged cover for surface mounting unless otherwise indicated.

3.8 LOADCENTERS

3.8.1 Loadcenters

Loadcenters shall be circuit breaker equipped.

3.9 AERIAL SERVICE

Services shall conform to the requirements of Section 16370 ELECTRICAL DISTRIBUTION SYSTEM, AERIAL, IEEE C2, and NFPA 70. The service drop conductors shall be continuous from the point of connection on the last pole to the disconnection switch. Penetration of the conduit through an exterior wall shall be sealed to prevent the entrance of moisture. Service entrance conductors shall be routed in RGS in the exterior wall, or in the interior of the building or facility that contains the service entrance equipment.

3.10 LIGHTING FIXTURES, LAMPS

This paragraph shall cover the installation of lamps, lighting fixtures and ballasts in interior or building mounted applications.

3.10.1 Lamps

Lamps of the type, wattage, and voltage rating indicated shall be delivered to the project in the original cartons and installed just prior to project completion. Lamps installed and used for working light during construction shall be replaced prior to turnover to the Government if more than 15% of their rated life has been used. Lamps shall be tested for proper operation prior to turn-over and shall be replaced if necessary with new lamps from the original manufacturer. 10% spare lamps of each type, from the original manufacturer, shall be provided.

3.10.2 Lighting Fixtures

Fixtures shall be as shown and shall conform to the following specifications and shall be as detailed on the drawings. Illustrations shown on the drawings are indicative of the general type desired and are not intended to restrict selection to fixtures of any particular manufacturer. Fixtures of similar designs and equivalent energy efficiency, light distribution and brightness characteristics, and of equal finish and quality will be acceptable if approved. In suspended acoustical ceilings with fluorescent fixtures, the fluorescent emergency light fixtures shall be furnished with self-contained battery packs.

3.10.2.1 Accessories

Accessories such as straps, mounting plates, nipples, or brackets shall be provided for proper installation.

3.11 EQUIPMENT CONNECTIONS

Wiring not furnished and installed under other sections of the specifications for the connection of electrical equipment as indicated on the drawings shall be furnished and installed under this section of the specifications. Connections shall comply with the applicable requirements of paragraph WIRING METHODS. Flexible conduits 6 feet or less in length shall be provided to all Electrical Equipment subject to periodic removal, vibration, or movement and for all motors. All motors shall be provided with separate grounding conductors. Liquid-tight conduits shall be used in damp or wet locations.

3.12 REPAIR OF EXISTING WORK

The work shall be carefully laid out in advance, and where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceiling, or other surfaces is necessary for the proper installation, support, or anchorage of the conduit, raceways, or other electrical work, this work shall be carefully done, and any damage to building, piping, or equipment shall be repaired by skilled mechanics of the trades involved at no additional cost to the Government.

3.13 Safety

The Contractor shall provide and use safety devices such as rubber gloves, protective barriers, and danger signs to protect and warn personnel in the test vicinity. The Contractor shall replace any devices or equipment which are damaged due to improper test procedures or handling.

3.14 ACCEPTANCE

Final acceptance of the facility will not be given until the Contractor has successfully completed all work and after all defects in installation, material or operation have been corrected.

-- End of Section --