

8 WELLS

N62470-80-B-0399

NAVFAC  
SPECIFICATION

No. 05-80-0399

AMENDMENT NO. 0001

old 621 ✓ 629  
LCH 4006 ✓ → LCH 4009  
old 611 ✓ 623  
old 614 ✓ 622  
old 627 ✓ 661  
old 639 ✓ 662  
638 Moved TO TT.  
~~638~~  
PR-227

# IMPORTANT

This amendment should be acknowledged when your bid is submitted. Failure to acknowledge the amendment may constitute grounds for rejection of the bid.

If your bid has been submitted prior to the receipt of this amendment, acknowledgment should be made by telegram, which should state whether the price contained in your sealed bid is to remain unchanged, is to be decreased by an amount, or is to be increased by an amount. The acknowledgment must be received prior to bid opening time.

If not completed by 5-14-84  
notify David

Warranty  
Out  
Apr-85



AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. AMENDMENT/MODIFICATION NO. 0001	2. EFFECTIVE DATE 7-1-82	3. REQUISITION/PURCHASE REQUEST NO.	4. PROJECT NO. (If applicable)
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5. ISSUED BY Commander, Atlantic Division Naval Facilities Engineering Command Norfolk, Virginia 23511	6. ADMINISTERED BY (If other than block 5)
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7. CONTRACTOR NAME AND ADDRESS  (Street, city, county, state, and ZIP Code)	8. AMENDMENT OF SOLICITATION NO. <input checked="" type="checkbox"/> N62470-80-B-0399 DATED 6-3-82 (See block 9) MODIFICATION OF CONTRACT/ORDER NO. <input type="checkbox"/> DATED _____ (See block 11)
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9. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in block 12. The hour and date specified for receipt of Offers  is extended,  is not extended.

Offerors must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended, by one of the following methods:

(a) By signing and returning 2 copies of this amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If, by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

10. ACCOUNTING AND APPROPRIATION DATA (If required)

11. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS

(a)  This Change Order is issued pursuant to \_\_\_\_\_  
The Changes set forth in block 12 are made to the above numbered contract/order.

(b)  The above numbered contract/order is modified to reflect the administrative changes (such as changes in paying office, appropriation data, etc.) set forth in block 12.

(c)  This Supplemental Agreement is entered into pursuant to authority of \_\_\_\_\_  
It modifies the above numbered contract as set forth in block 12.

12. DESCRIPTION OF AMENDMENT/MODIFICATION

REPLACE WATER WELLS  
AT THE  
MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA

DIVISION 1. GENERAL REQUIREMENTS

SECTION 01011. GENERAL PARAGRAPHS

18. SCHEDULING THE WORK

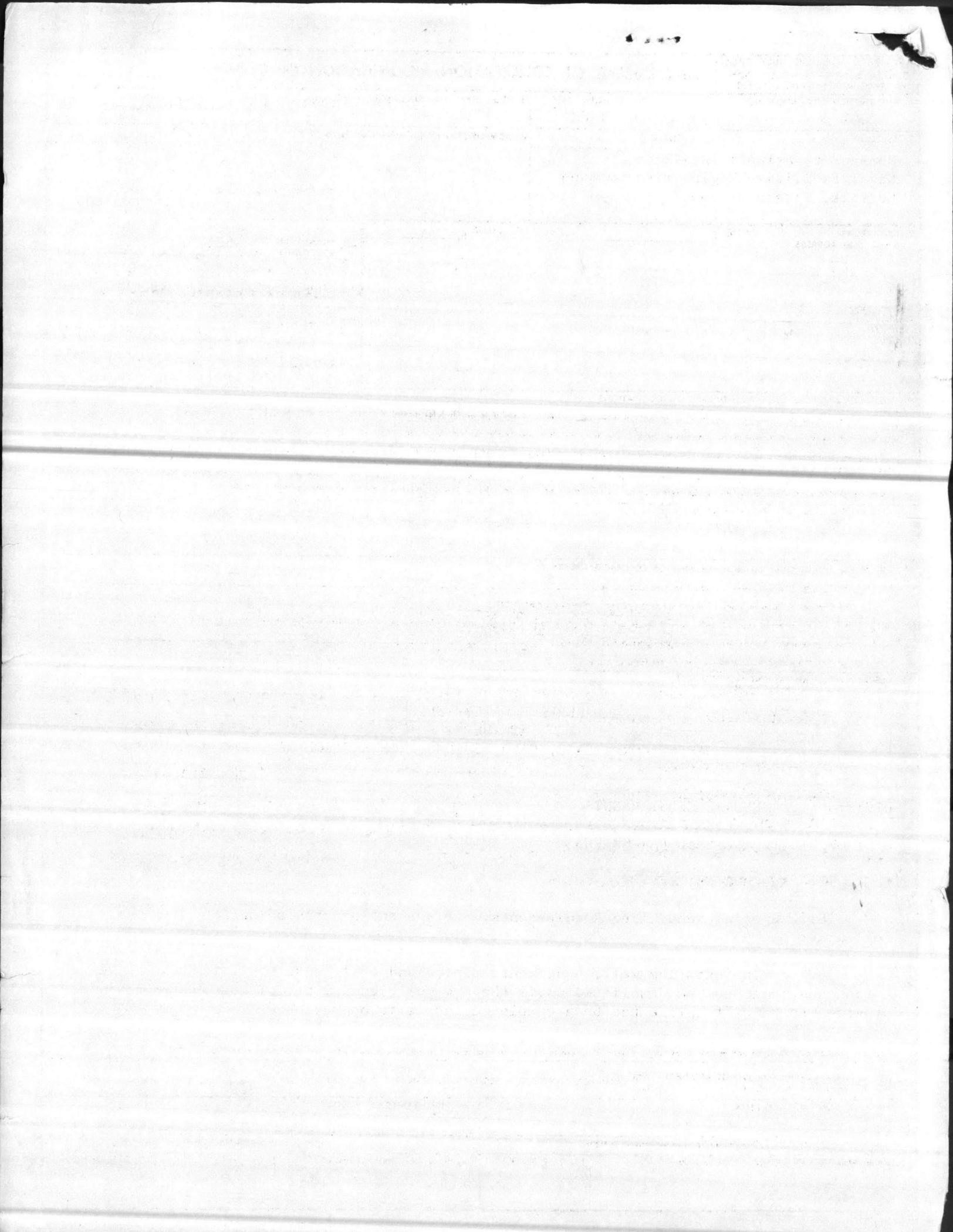
18.2 Special Scheduling Requirements. At the end of this paragraph, add the following:

"18.2.2 The existing well, equipment, piping and well house shall remain in operation and shall not be demolished until the new well, equipment, piping and well house provided to take its place has been completed and is in operation."

13.  CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT  CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN \_\_\_\_\_ COPIES TO ISSUING OFFICE

14. NAME OF CONTRACTOR/OFFEROR BY _____ (Signature of person authorized to sign)	17. UNITED STATES OF AMERICA BY _____ (Signature of Contracting Officer)
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15. NAME AND TITLE OF SIGNER (Type or print)	16. DATE SIGNED	18. NAME OF CONTRACTING OFFICER (Type or print)	19. DATE SIGNED
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"THIS PROJECT IS 100% SET ASIDE FOR SMALL BUSINESS CONCERNS"

STANDARD FORM 20  
JANUARY 1961 EDITION  
GENERAL SERVICES ADMINISTRATION  
FED. PROC. REG. (41 CFR) 1-16.401

REFERENCE

IFB N62470-80-B-0399  
Specification No. 05-80-0399

**INVITATION FOR BIDS**  
**(CONSTRUCTION CONTRACT)**

DATE

3 June 1982

<b>NAME AND LOCATION OF PROJECT</b> Replace Water Wells Marine Corps Base Camp Lejeune North Carolina	<b>DEPARTMENT OR AGENCY</b> Department of the Navy Naval Facilities Engineering Command
<b>BY (Issuing Office)</b> Atlantic Division Naval Facilities Engineering Command Norfolk, Virginia 23511	Contract to be awarded as a result of this solicitation shall be assigned a <u>DO-C2</u> rating in accordance with the provisions of BDSA Reg 2 and/or DMS Reg 1.

Sealed bids in duplicate for the work described herein will be received until 2:00 p.m. 13 JULY 1982, by the Commander, Atlantic Division, Naval Facilities Engineering Command, Building N-21, Room 105, Naval Station, Norfolk, Virginia 23511

and at that time publicly opened.

\*\*\*PLANS AND SPECIFICATIONS WILL BE AVAILABLE ON OR AFTER 10 JUNE 1982\*\*\*

Information regarding bidding material, bid guarantee, bonds and drawings:

SPECIFICATION NO. 05-80-0399 and other bidding data and information may be obtained or examined on application to the Commander, Atlantic Division, Naval Facilities Engineering Command (Code No. 04), Room 361, Bldg. N-26, Naval Station, Norfolk, Virginia 23511

NOTE: If the BID is \$25,000 or greater, failure to submit BID GUARANTY at the time of Bid Opening is cause for rejection of THE BID

PLANS/SPECIFICATIONS REQUEST: Refer to LANTDIV FORM SND 3-4250/20.

\* TO ORDER PLANS AND SPECS, CALL: AREA CODE 804-444-3595\*\*\*\*

For information concerning this contract:

PRIOR to bid opening date — Telephone 444- 9900

AFTER bid opening date — Telephone 444- 9511

NOTE: Full-size drawings for this project are available to bidders at the bidder's expense. If full-size drawings are desired, the Officer in Charge of Construction should be contacted for the procedure to obtain them. Full-size drawings may be inspected during regular working hours at the office of the Officer in Charge of Construction.

NOTE: When published in commercial periodicals, this is for NEWS RELEASE only.

**NOT A PAID ADVERTISEMENT**

**Description of work:** The work includes the provision of eight unconsolidated water wells including well, well house, mechanical equipment, electrical equipment and demolition of eight existing wells and well houses and incidental related work at the Marine Corps Base, Camp Lejeune, North Carolina.

PAUL R. GATES, RADM, CEC, USN  
Commander, Atlantic Division  
Naval Facilities Engineering Command

Estimated Cost Range: Between \$500,000 and \$1,000,000

3 June 1982

05-80-0399

(SEE REVERSE SIDE)

NOTICE OF TOTAL SMALL BUSINESS SET-ASIDE (1972 JUL)

(a) Restriction. Offers under this procurement are solicited from small business concerns only and this procurement is to be awarded only to one or more small business concerns. This action is based on a determination by the Contracting Officer, alone or in conjunction with a representative of the Small Business Administration that it is in the interest of maintaining or mobilizing the Nation's full productive capacity, in the interest of war or national defense programs, or in the interest of assuring that a fair proportion of Government procurement is placed with small business concerns. Offers received from firms which are not small business concerns shall be considered nonresponsive and shall be rejected.

(b) Definition. A "small business concern" is a concern, including its affiliates, which is independently owned and operated, is not dominant in the field of operation in which it is offering on Government contracts, and can further qualify under the criteria set forth in regulations of the Small Business Administration (Code of Federal Regulations, Title 13, Section 121.3-8). In addition to meeting these criteria, a manufacturer or a regular dealer submitting offers in his own name must agree to furnish in the performance of the contract end items manufactured or produced by small business concerns: Provided, That this additional requirement does not apply in connection with construction or service contracts.

Bid or proposals received from firms which are not small business concerns shall be considered nonresponsive.

Standard Industrial Classification No. 1781 applies and the applicable size standard for this procurement is \$ 5,000,000.

"Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Mar 1981) is attached hereto as Appendix "A" and hereby made a part hereof."

APPENDIX "A"

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION  
TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (1981 MAR)

(a) The Offeror's or Bidder's attention is called to the "Equal Opportunity" and the "Affirmative Action Compliance Requirements for Construction" clauses set forth herein.

(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 in  
each trade

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23.5

6.9

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These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area.

If the contractor performs construction work (whether or not it is Federal or Federally assisted) in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where such work is actually performed.

Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs (OFCCP) office.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity clause, specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance, Requirements for Construction" and its efforts to meet prescribed goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and 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, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

(c) The Contractor shall provide written notification to the Director, OFCCP within 10 working days of 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 name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

(d) As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is the counties of Columbus, Duplin, Onslow, and Pender, North Carolina.

SECTION 00101

BIDDING INFORMATION

1. CONTENTS: This Invitation for Bids, IFB No. N62470-80-B-0399, consists of the following documents:

(a) Bid Instruction Documents

- (i) Invitation for Bids (Standard Form 20, Jan. 1961, Ed).
- (ii) Bidding Information.
- (iii) Instructions to Bidders, dated March 1979.

(b) Bid Submittal Documents

- (i) Bid Form (Standard Form 21, Dec. 1965 Ed.)
- (ii) Representations and Certifications (Standard Form 19-B, Jun 1976 Ed.) (Rev. 1980 Aug), including Appendix "A" dated August 1980.
- (iii) Bid Guaranty (Standard Form 24, Jun 1964 Ed.) (See Instructions to Bidders.)

(c) Contract Documents

- (i) Construction Contract (Standard Form 23, Jan 1961 Ed.)
- (ii) Performance Bond (Standard Form 25, Jun 1967 Ed.) (See Instructions to Bidders).
- (iii) Payment Bond (Standard Form 25A, Jun 1964 Ed.) (See Instructions to Bidders).
- (iv) Labor Standards Provisions, dated November 1979.
- (v) General Provisions dated March 1981 (REV. 12-81).
  - a. Clause 43. ACCIDENT PREVENTION (1977 Jun): Change the date of the Corps of Engineers Manual, EM 385-1-1, from "1 June 1977" to "1 April 1981".
- (vi) NAVFAC Specification No. 05-80-0399.
- (vii) Drawings identified in Section 01011, Division 1 of the Specifications.
- (viii) Wage Determination Decision, Secretary of Labor Decision No. NC81-1148, with Modification No. 1

2. BIDS:

2.1 Instructions to Bidders: Instructions to Bidders, and Invitation for Bids, Standard Form 20, January 1961 edition, shall be observed in the preparation of bids. Bidders shall affix their names and return addresses in the upper left corner of bid envelope. Envelopes containing bids must be sealed.

2.2 Bid Guaranty: For bids of \$25,000 or greater, a bid guaranty will be required as stipulated in the Instructions to Bidders.

2.3 Items Of Bids: Bids shall be submitted, in duplicate, on Standard Form 21, Bid Form, and shall be accompanied by Standard Form 19B, Representations and Certifications, including Appendix "A" thereto, and by Bid Guaranty, all in accordance with the Bid Instruction Documents listed in paragraph hereinbefore upon the following item(s):

Base Bid

Price for the entire work complete in accordance with the drawings and specifications.

2.4 Telegraphic Modifications of Bids: Telegraphic modifications of bids may be made in accordance with the Instructions to Bidders. Two signed copies of the telegram in a sealed envelope marked "Copies of telegraphic modification of bid for Replace Water Wells, Specification No. 05-80-0399" should be forwarded immediately to the office to which the written bids were submitted.

2.5 Telegraphic Modifications Or Withdrawal Of Bids: Telegraphic modifications or withdrawal of bids will be considered as specified herein. TELEPHONIC RECEIPT OF TELEGRAPHIC MODIFICATIONS OR WITHDRAWAL OF BIDS WILL NOT QUALIFY THE TELEGRAM AS TIMELY. The telegram must be received at the place specified for receipt of bids prior to the exact time set for receipt of bids.

2.6 Hand Delivered Bids: All hand delivered bids must be deposited in the bid box at the Atlantic Division, Naval Facilities Engineering Command, Contract Division, Room No. 105, Building N-21, Naval Station, Norfolk, Virginia, prior to the time and date set for bid opening. Any bids submitted by hand after the time set for receipt will not be accepted.

3. PRE-BID SITE VISITATION: To inspect the site of the work prior to bid opening, prior appointment must be made with the Assistant Resident Officer in Charge of Construction, Jacksonville, North Carolina Area telephone: (919) 451-2581. Bidders are urged and expected to inspect the site where services are to be performed and to satisfy themselves as to all general and local conditions that may affect the cost of performance of the contract to the extent such information is reasonably obtainable. In no event will a failure to inspect the site constitute grounds for withdrawal of a bid after opening or for a claim after award of the contract.

4. CONTROLLED MATERIALS DATA: The Contracting Officer will issue a DO-C2 priority rating for procurement of critical materials. See provision entitled, "Priorities, Allocations and Allotments" of the General Provisions.

5. INQUIRIES: All questions concerning the bidding or any other phase of the plans and specifications occurring prior to bid opening shall be presented to the Design Division, Atlantic Division, Naval Facilities Engineering Command, Building N-26, Room 307, Naval Station, Norfolk, Virginia 23511, telephone 444-9900, area code 804. Questions requiring interpretation of drawings and specifications must be submitted at least 10 days before bid opening. Interpretations or modifications to specifications made as a result of questions will be made by amendment only, and unless so done, all bidders should base their bids on the plans and specifications as issued.

6. AVAILABILITY OF SPECIFICATIONS, STANDARDS AND DESCRIPTIONS (1977 JUN): Specifications, standards and descriptions cited in this solicitation are available as indicated below:

(a) Unclassified Federal, Military and Other Specifications and Standards (Excluding Commercial), and Data Item Descriptions. Submit request on DD Form 1425 (Specifications and Standards Requisition) to:

COMMANDING OFFICER  
U. S. NAVAL PUBLICATIONS AND FORMS CENTER  
5801 TABOR AVENUE -- PHILADELPHIA, PA 19120

The Acquisition Management Systems and Data Requirements Control List, DoD directive 500.19-L, Volume II, may be ordered on the DD Form 1425. The Department of Defense Index of Specifications and Standards (DODISS) may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402. When requesting a specification or standard, the request shall indicate the title, number, date and any applicable amendment thereto by number and date. When requesting a data item description, the request shall cite the solicitation. When DD Form 1425 is not available, the request may be submitted in letter form giving the same information as listed above, and the solicitation or contract number involved. Such request may also be made to the activity by Telex No. 834295, Western Union No. 710-670-1685, or telephone (area code 215, 697-3321) in case of urgency.

(b) Commercial Specifications, Standards and Descriptions: These specifications, standards and descriptions are not available from Government sources. They may be obtained from the publishers.

(c) Availability for Examination of Specifications, Standards, Plans, Drawings, and Other Pertinent Documents: The specifications, standards, plans, drawings, and other pertinent documents cited in this solicitation may be examined at the following location:

ATLANTIC DIVISION, NAVAL FACILITIES ENGINEERING COMMAND  
DESIGN DIVISION, SPECIFICATIONS BRANCH  
CODE 406, ROOM 396, BUILDING N-26  
NAVAL STATION, NORFOLK, VIRGINIA 23511

7. RECOVERED MATERIAL: The Contractor certifies by signing this bid/proposal/quotation that recovered materials, as defined in DAR 1-2500.4 will be used as required by the applicable specifications.

8. CERTIFICATE OF CURRENT COST OR PRICING DATA: (This paragraph applies to negotiated contracts of \$500,000, or more except where the price is based on adequate competition, and to change orders of \$500,000, or more, to any contract.) The Contractor shall submit to the Contracting Officer a certificate in the form set forth below as soon as practicable after agreement is reached on the contract price:

This is to certify that, to the best of my knowledge and belief, cost or pricing data as defined in DAR 3-807.1(a)(1) submitted, either actually or by specific identification in writing (see DAR 3-807.3(a) to the Contracting Officer or his representative in support of \_\_\_\_\_ are accurate, complete, and current as of \_\_\_\_\_ day, \_\_\_\_\_ month, \_\_\_\_\_ year.

This certification includes the cost or pricing data supporting any advance agreement(s) and forward pricing rate agreements between the offeror and the Government which are part of the proposal.

FIRM \_\_\_\_\_  
NAME \_\_\_\_\_  
TITLE \_\_\_\_\_

\*\*\*

\_\_\_\_\_  
Date of Execution

\*Describe the proposal, quotation, request for price adjustment or other submission involved, giving appropriate identifying number (e.g. RFP No. \_\_\_\_\_).

\*\*The effective date shall be the date when price negotiations were concluded and the contract price was agreed to. The responsibility of the contractor is not limited by the personal knowledge of the contractor's negotiator if the contractor had information reasonably available at the time of agreement, showing that the negotiated price is not based on accurate, complete and current data.

\*\*\*This date should be as close as practicable to the date when the price negotiations were concluded and the contract price was agreed to.

9. NORTH CAROLINA STATE AND LOCAL SALES AND USE TAX (1977 JAN):

(a) As used throughout this clause, the term "materials" means building materials, supplies, fixtures and equipment which become a part of or are annexed to any building or structure erected, altered, or repaired under this contract.

05-80-0399

00101-4

(b) If this is a fixed-price type contract as defined in the Defense Acquisition Regulation, the contract price includes North Carolina state and local sales and use taxes to be paid with respect to materials, notwithstanding any other provision of this contract. If this is a cost-reimbursement type contract as defined in such regulation, any North Carolina state and local sales and use taxes paid by the Contractor with respect to materials shall constitute an allowable cost under this contract.

(c) At the time specified in paragraph (d) below:

(i) The Contractor shall furnish the Contracting Officer certified statements setting forth the cost of the materials purchased from each vendor and the amount of North Carolina state and local sales and use taxes paid thereon. In the event the Contractor makes several purchases from the same vendor, such certified statement shall indicate the invoice numbers, the inclusive dates of the invoices, the total amount of the invoices and the North Carolina state and local sales and use taxes paid thereon. Such statement shall also include the cost of any tangible personal property withdrawn from the Contractor's warehouse stock and the amount of North Carolina state and local sales or use tax paid thereon by the Contractor. Any local sales or use taxes included in the Contractors' statements must be shown separately from the state sales or use tax. The Contractor shall furnish such additional information as the Commissioner of Revenue of the State of North Carolina may require to substantiate a refund claim for sales or use taxes.

(ii) The Contractor shall obtain and furnish to the Contractor Officer similar certified statements by its subcontractors.

(d) If this contract is completed before the next October 1, the certified statements to be furnished pursuant to paragraph (c) above shall be submitted within 60 days after completion. If this contract is not completed before the next October 1, such certified statements shall be submitted on or before the 30th day of November of each year and shall cover taxes paid during the twelve month period which ended the preceding September 30.

(e) The certified statements to be furnished pursuant to paragraph (c) above shall be in the following form:

I hereby certify that during the period \_\_\_\_\_ to \_\_\_\_\_, (name of Contractor or subcontractor) paid North Carolina state and local sales and use taxes aggregating \$ \_\_\_\_\_ (state) and \$ \_\_\_\_\_ (local) with respect to building materials, supplies, fixtures and equipment which have become a part of or annexed to a building or structure erected, altered or repaired by (name of Contractor) for the United States of America, and that the vendors from whom the property was purchased, the dates and numbers of the invoices covering the purchases, the total amount of the invoices of each vendor, the North Carolina state and local sales and use taxes paid thereon, shown separately, and the cost of property withdrawn from warehouse stock and North Carolina state and local sales or use taxes paid thereon are as set forth in the attachments hereto.

10. REFERENCE TO AMENDMENTS: Each bidder shall refer in his bid to all amendments to this specifications; failure to do so may constitute an informality in the bid.

END OF SECTION

March 1979

INSTRUCTIONS TO BIDDERS  
(Construction Contract)

(Instructions 1 through 11 are those prescribed by the General Services Administration in Standard Form 22, February 1978 Edition, as amended pursuant to the latest revisions of the Defense Acquisition Regulation).

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THE STATUTES OF THE

REPUBLIC OF SOUTH AFRICA

ACT NO. 108 OF 1996

PROVISIONS RELATIVE TO

THE SOUTH AFRICAN

DEFENCE FORCE

AND RELATED MATTERS

ENACTED AT CAPETOWN

ON THE 12TH DAY OF

MAY 1996

IN THE PRESENCE OF

THE SPEAKER OF PARLIAMENT

AND THE DEPUTY SPEAKER

OF PARLIAMENT

AND THE ATTORNEY GENERAL

AND THE ATTORNEY GENERAL

OF THE NORTHERN CAPE PROVINCE

AND THE ATTORNEY GENERAL

OF THE FREE STATE PROVINCE

AND THE ATTORNEY GENERAL

OF THE KWAZULU-NATAL PROVINCE

AND THE ATTORNEY GENERAL

OF THE LIMPPOPO PROVINCE

AND THE ATTORNEY GENERAL

OF THE NORTHERN PROVINCE

AND THE ATTORNEY GENERAL

OF THE WESTERN CAPE PROVINCE

AND THE ATTORNEY GENERAL

OF THE NORTH WEST PROVINCE

AND THE ATTORNEY GENERAL

OF THE EASTERN CAPE PROVINCE

AND THE ATTORNEY GENERAL

OF THE REPUBLIC OF SOUTH AFRICA

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March 1979

INSTRUCTIONS TO BIDDERS  
(Construction Contract)

(Instructions 1 through 11 are those prescribed by the General Services Administration in Standard Form 22, February 1978 Edition, as amended pursuant to the latest revisions of the Defense Acquisition Regulation).

1. EXPLANATIONS TO BIDDERS - Any explanation desired by a bidder regarding the meaning or interpretation of the invitation for bids, drawings, specifications, etc., must be requested in writing and with sufficient time allowed for a reply to reach bidders before the submission of their bids. Any interpretation made will be in the form of an amendment of the invitation for bids, drawings, specifications, etc., and will be furnished to all prospective bidders. Its receipt by the bidder must be acknowledged in the space provided on the Bid Form (Standard Form 21) or by letter or telegram received before the time set for opening of bids. Oral explanations or instructions given before the award of the contract will not be binding.

2. CONDITIONS AFFECTING THE WORK - Bidders should visit the site and take such other steps as may be reasonably necessary to ascertain the nature and location of the work, and the general and local conditions which can affect the work or the cost thereof. Failure to do so will not relieve bidders from responsibility for estimating properly the difficulty or cost of successfully performing the work. The Government will assume no responsibility for any understanding or representations concerning conditions made by any of its officers or agents prior to the execution of the contract, unless included in the invitation for bids, the specifications, or related documents.

3. BIDDER'S QUALIFICATIONS - Before a bid is considered for award, the bidder may be requested by the Government to submit a statement re-

garding his previous experience in performing comparable work, his business and technical organization, financial resources, and plant available to be used in performing the work.

4. BID GUARANTEE - Where a bid guarantee is required by the invitation for bids, 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.

A bid guarantee shall be in the form of a firm commitment, such as a bid bond, 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. Bid guarantees, other than bid bonds, will be returned (a) to unsuccessful bidders as soon as practicable after the opening of bids, and (b) to the successful bidder upon execution of such further contractual documents and bonds (including any necessary coinsurance or reinsurance agreements) as may be required by the bid as accepted.

If the successful bidder, upon acceptance of his bid by the Government within the period specified therein for acceptance (sixty days if no period is specified) fails to execute such further contractual documents, if any, and give such bond(s) (including any necessary coinsurance or reinsurance agreements) as may be required by the terms of the bid as accepted within the time specified (ten days if no period is specified) after receipt of the

forms by him, his contract may be terminated for default. In such event he shall be liable for any cost of procuring the work which exceeds the amount of his bid, and the bid guarantee shall be available toward offsetting such difference. (1964 JUN)

5. PREPARATION OF BIDS - (a) Bids shall be submitted on the forms furnished, or copies thereof, and must be manually signed. If erasures or other changes appear on the forms, each erasure or change must be initialed by the person signing the bid. Unless specifically authorized in the invitation for bids, telegraphic bids will not be considered.

(b) The bid form may provide for submission of a price or prices for one or more items, which may be lump sum bids, alternate prices, scheduled items resulting in a bid on a unit of construction or a combination thereof, etc. Where the bid form explicitly requires that the bidder bid on all items, failure to do so will disqualify the bid. When submission of a price 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.

(c) Unless called for, alternate bids will not be considered.

(d) Modification of bids already submitted will be considered if received at the office designated in the invitation for bids by the time set for opening of bids. Telegraphic modifications will be considered, but should not reveal the amount of the original or revised bid.

6. SUBMISSION OF BIDS - Bids must be sealed, marked, and addressed as directed in the invitation for bids. Failure to do so may result in a premature opening of, or a failure to open, such bid.

#### 7. LATE BIDS, MODIFICATIONS OF BIDS OR WITHDRAWAL OF BIDS (1979 Mar)

(a) Any bid received at the office designated in the solicitation after the exact time specified for receipt will not be considered unless it is received before award is made and either;

(i) it was sent by registered or certified mail not later than the fifth calendar day prior to the date specified for the receipt of bids (e.g., a bid submitted in response to a solicitation requiring receipt of bids by the 20th of the month must have been mailed by the 15th or earlier); or

(ii) it was sent by mail (or telegram if authorized) and it is determined by the Government that the late receipt was due solely to mishandling by the Government after receipt at the Government installation.

(b) Any modification or withdrawal of bid is subject to the same conditions as in (a) above except that withdrawal of bids by telegram is authorized. A bid may also be withdrawn in person by a bidder or his authorized representative, provided his identity is made known and he signs a receipt for the bid, but only if the withdrawal is made prior to the exact time set for receipt of bids.

(c) The only acceptable evidence to establish;

(i) the date of mailing of a late bid, modification or withdrawal sent either by registered or certified mail is the U.S. or Canadian Postal

Service postmark on the wrapper or on the original receipt from the U.S. or Canadian Postal Service. If neither postmark shows a legible date, the bid, modification or withdrawal shall be deemed to have been mailed late. (The term "postmark" means a printed, stamped, or otherwise placed impression (exclusive of a postage meter machine impression) that is readily identifiable without further action as having been supplied and affixed on the date of mailing by employees of the U.S. or Canadian Postal Service. Therefore, offerors, should request the postal clerk to place a hand cancellation bull's-eye "postmark" on both the receipt and the envelope or wrapper.)

(ii) the time of receipt at the Government installation is the time/date stamp of such installation on the bid wrapper or other documentary evidence of receipt maintained by the installation.

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

NOTE: The term "telegram" includes mailgrams.

8. PUBLIC OPENING OF BIDS - Bids will be publicly opened at the time set for opening in the invitation for bids. Their content will be made public for the information of bidders and others interested, who may be present either in person or by representative.

9. AWARD OF CONTRACT - (a) Award of contract will be made to that responsible bidder whose bid, conforming to the invitation for bids is most advantageous to the Government, price and other factors considered.

(b) The Government may, when in its interest, reject any or all bids or waive any informality in bids received.

(c) The Government may accept any item or combination of items of a bid, unless precluded by the invitation for bids or the bidder includes in his bid a restrictive limitation.

10. CONTRACT AND BONDS - The bidder whose bid is accepted will, within the time established in the bid, enter into a written contract with the Government and, if required, furnish performance and payment bonds on Government standard forms in the amounts indicated in the invitation for bids or the specifications. (1979 MAR)

11. BID SUBMISSION - Bids shall be submitted only upon the items of bids stated in the specifications; bids upon other bases will not be considered unless specifically requested by the Government. Bids that do not reference all amendments or that are not submitted on the prescribed forms may be considered nonconforming. The Officer whose duty it is to open the bids will decide when the specified time has arrived, and no bids (or modification or withdrawal of bid) will be considered if received by the Navy after the reading of the bids has begun except as provided in the "Late Bids and Modifications or Withdrawals" provisions of this invitation. Discrepancies, ambiguities, errors, or omissions to the bidding data should be reported promptly to the office from which the data were obtained.

## 12. BID GUARANTY

(Applicable only to bids of \$25,000 or more.) To assure the execution of the contract and the performance and payment bonds, each bidder shall submit with its bid a guaranty bond (Standard Form 24) executed by a surety company holding a certificate of authority from the Secretary of the Treasury as an acceptable surety, or other security as provided in paragraph 4 of Instructions to Bidders. Security shall be in the sum of 20 percent of the largest amount for which award can be made under the bid submitted, but in no case to exceed \$3,000,000. The bid guaranty bond shall be accompanied by a verifax or other facsimile copy of the agent's authority to sign bonds for the surety company.

## 13. CONTRACT AND BONDS

(Applicable only to bids of \$25,000 or more.) Within 10 days after the prescribed forms are presented to him for signature, the bidder to whom award is made shall enter into a written contract on the form prescribed by the specification and shall furnish two bonds, each with satisfactory security; namely, a performance bond (Standard Form 25) and a payment bond (Standard Form 25A). The performance bond shall be in a penal sum equal to 100 percent of the contract price. The payment bond shall be equal to 50 percent of the contract price, except that it shall be 40 percent of the contract price if that price is more than \$1,000,000 and not more than \$5,000,000, and in the fixed sum of \$2,500,000 if the contract price is more than \$5,000,000. The bond of any surety company holding a certificate of authority from the Secretary of the Treasury as an acceptable surety on Federal bonds will be accepted. Individual sureties will be accepted if

each such surety deposits with the Contracting Officer cash, bonds, or notes of the United States, or certified check drawn to the order of the Treasurer of the United States, or such other security as the Contracting Officer may deem necessary for the required amount of the guaranty, under the agreement that the collateral so deposited shall remain in the possession and control of the Treasurer of the United States for at least one year after the completion of the contract. The contract time for purposes of fixing the completion date, default, and liquidated damages shall begin to run 15 days from the mailing of acceptance, regardless of when the formal contract and bonds are executed.

14. NOTE THE AFFIRMATIVE ACTION REQUIREMENT OF THE EQUAL OPPORTUNITY CLAUSE WHICH MAY APPLY TO THE CONTRACT RESULTING FROM THIS SOLICITATION

15. NOTE THE CERTIFICATION OF NONSEGREGATED FACILITIES IN THIS SOLICITATION

Bidders, offerors and applicants are cautioned to note the "Certification of Nonsegregated Facilities" in the solicitation. Failure of a bidder or offeror to agree to the certification will render his bid or offer nonresponsive to the terms of solicitations involving awards of contracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause (1978 SEP)

16. COST LIMITATIONS

A bid which does not contain separate bid prices for the items identified as subject to a cost limitation may be considered nonresponsive. A bidder by signing his bid certifies that each price bid on items subject to a cost limitation include an approp-

riate apportionment of all applicable estimated costs, direct and indirect, as well as overhead and profit. Bids may be rejected which (i) have been materially unbalanced for the purpose of bringing affected items within cost limitations or (ii) exceed the cost limitations unless such limitations have been waived by the Assistant Secretary of Defense (installations and Logistics) prior to award. (1974 APR)

17. BIDS MUST SET FORTH FULL, ACCURATE, AND COMPLETE INFORMATION AS REQUIRED BY THIS INVITATION FOR BIDS (INCLUDING ATTACHMENTS). THE PENALTY FOR MAKING FALSE STATEMENTS IN BIDS IS PRESCRIBED IN 18 U.S.C. 1001

18. BIDS - ACCEPTANCE PERIOD (1960 APR)

Bids offering less than the period of days specified for acceptance by the Government from the date set for opening of bids will be considered nonresponsive and will be rejected.

19. ADDITIVE OR DEDUCTIVE ITEMS (1968 APR)

If this invitation includes more than one bid item, the following clause applies.

The low bidder for purposes of award shall be the conforming responsible bidder offering the low aggregate amount for the first or base bid item, plus or minus (in the order of priority listed in the schedule) those additive or deductive bid items providing the most features of the work within the funds determined by the Government to be available before bids are opened. If addition of another bid item in the listed order of priority would make the award exceed such funds for all bidders, it shall be skipped and the next subsequent additive bid item in a lower

amount shall be added if award thereon can be made within such funds. For example, when the amount available is \$100,000, and a bidder's base bid and four successive additives are \$85,000, \$10,000, \$8,000, \$6,000, and \$4,000, the aggregate amount of the bid for purposes of award would be \$99,000 for the base bid plus the first and fourth additives, the second and third additives being skipped because each of them would cause the aggregate bid to exceed \$100,000. In any case all bids shall be evaluated on the basis of the same additive or deductive bid items, determined as above provided. The listed order of priority need be followed only for determining the low bidder. After determination of the low bidder as stated, award in the best interests of the Government may be made to him on his base bid and any combination of his additive or deductive bid for which funds are determined to be available at the time of the award, provided that award on such combination of bid items does not exceed the amount offered by any other conforming responsible bidder for the same combination of bid items.

20. SPECIAL PROVISIONS - SF 19

If the successful bid exceeds \$10,000 and the contract is to be executed on Standard Form 19, the clauses set forth in the current Defense Acquisition Regulation, paragraphs 11-401.1(b) (Federal, State, and Local Taxes) and 12-804(a) (Equal Opportunity) apply.

21. MODIFICATIONS PRIOR TO DATE SET FOR OPENING BIDS

The right is reserved, as the interest of the Government may require, to revise or amend the specifications or drawings or both prior to the date set for opening bids. Such revisions

and amendments, if any, will be announced by an amendment or amendments to this Invitation for Bids. If the revisions and amendments are of a nature which requires material changes in quantities or prices to be bid or both, the date set for opening bids may be postponed by such number of days as in the opinion of the issuing officer will enable bidders to revise their bids. In such cases, the amendment will include an announcement of the new date for opening bids.

## 22. PARENT COMPANY

A parent company for the purpose of this offer is a company which either owns or controls the activities and basic business policies of the offeror. To own another company means the parent company must own at least a majority (more than 50 percent) of the voting rights in that company. To control another company, such ownership is not required; if another company is able to formulate, determine, or veto basic business policy decisions of the offeror, such other company is considered the parent company of the offeror. This control may be exercised through the use of dominating minority voting rights, use of proxy voting, contractual arrangements or otherwise.

## 23. EMPLOYER'S IDENTIFICATION NUMBER

(Applicable only to advertised solicitations). The offeror shall insert in the applicable space on the offer form, if he has no parent company, his own Employer's Identification Number (E.I. No.) (Federal Social Security Number used on Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941), or, if he has a parent company, the Employer's Identification Number of his parent company.

## 24. CERTIFICATION OF INDEPENDENT PRICE DETERMINATION

(a) This certification on the offer form is not applicable to a foreign offeror submitting an offer for a contract which requires performance of delivery outside the United States, its possessions, and Puerto Rico.

(b) An offer will not be considered for award where (a)(1), (a)(3), or (b) of the certification has been deleted or modified. Where (a)(2) of the certification has been deleted or modified, the offer will not be considered for award unless the offeror furnishes with the offer a signed statement which sets forth in detail the circumstances of the disclosure and the head of the agency, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

## 25. CONTINGENT FEE

If the offeror, by checking the appropriate box provided therefor, has represented that he has employed or retained a company or person (other than a full-time bona fide employee working solely for the offeror) to solicit or secure this contract, or that he has paid or agreed to pay any fee, commission, percentage, or brokerage fee to any company or person contingent upon or resulting from the award of this contract, he shall furnish, in duplicate, a complete Standard Form 119, Contractor's Statement of Contingent or Other Fees. If offeror has previously furnished a completed Standard Form 119 to the office issuing solicitation, he may accompany his offer with a signed statement (a) indicating when such completed form was previously furnished, (b) identifying by number the previous solicitation or contract, if any, in connection with

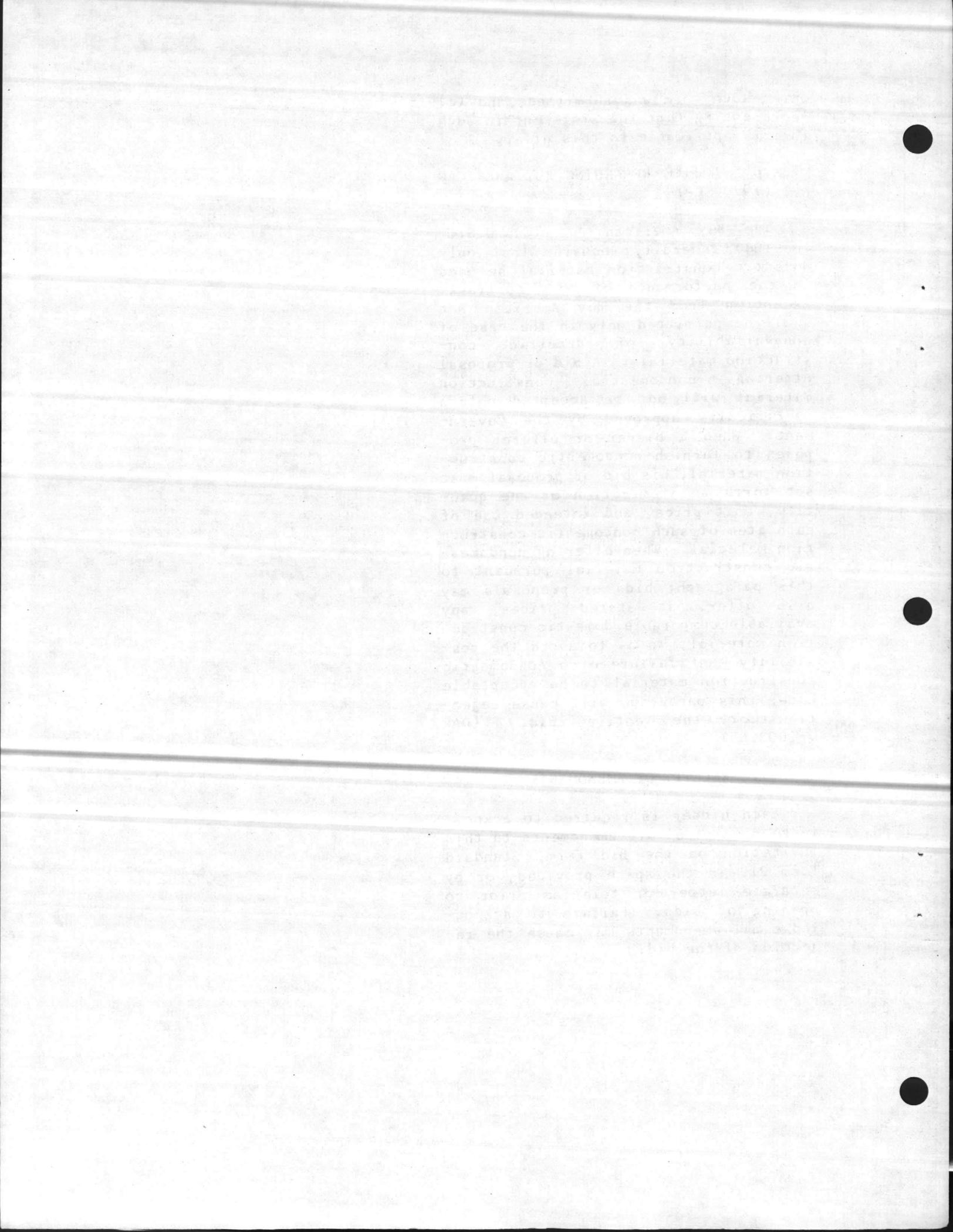
which such form was submitted, and (c) representing that the statement in such form is applicable to this offer.

26. NOTICE REGARDING BUY AMERICAN ACT (1970 SEP)

The Buy American Act (41 U.S.C. 10a-10d) generally requires that only domestic construction material be used in the performance of this contract. Exception from the Buy American Act shall be permitted only in the case of nonavailability of domestic construction materials. A bid or proposal offering nondomestic construction material will not be accepted unless specifically approved by the Government. When a bidder or offeror proposes to furnish nondomestic construction material, his bid or proposal must set forth an itemization of the quantity, unit price, and intended use of each item of such nondomestic construction material. When offering nondomestic construction material pursuant to this paragraph, bids or proposals may also offer, at stated prices, any available comparable domestic construction material, so as to avoid the possibility that failure of a nondomestic construction material to be acceptable under this paragraph will cause rejection of the entire bid. (DAR 7-2003.65)

27. RECEIPT OF AMENDMENTS

Each bidder is required to acknowledge receipt of all amendments to this invitation on the Bid Form, Standard Form 21, in the space provided, or by separate letter or telegram prior to opening of bids. Failure to acknowledge all amendments may cause the rejection of the bid.



**REPRESENTATIONS AND CERTIFICATIONS**

(Construction and Architect-Engineer Contract)  
(For use with Standard Forms 19, 21 and 252)

REFERENCE (Enter same No.(s) as on SF 19, 21 and 252)

NAME AND ADDRESS OF BIDDER (No., Street, City, State, and ZIP Code)

DATE OF BID

*In negotiated procurements, "bid" and "bidder" shall be construed to mean "offer" and "offeror."*

The bidder makes the following representations and certifications as a part of the bid identified above. (Check appropriate boxes.)

**1. SMALL BUSINESS**

He  is,  is not, a small business concern. (A small business concern for the purpose of Government procurement is a concern, including its affiliates, which is independently owned and operated, is not dominant in the field of operations in which it is bidding on Government contracts, and can further qualify under the criteria concerning number of employees, average annual receipts, or other criteria as prescribed by the Small Business Administration. For additional information see governing regulations of the Small Business Administration (13 CFR Part 121)).

**2. MINORITY BUSINESS ENTERPRISE**

He  is,  is not a minority business enterprise. A minority business enterprise is defined as a "business, at least 50 percent of which is owned by minority group members or, in case of publicly owned businesses, at least 51 percent of the stock of which is owned by minority group members." For the purpose of this definition, minority group members are Negroes, Spanish-speaking American persons, American-Orientals, American-Indians, American-Eskimos, and American-Aleuts."

**3. CONTINGENT FEE**

(a) He  has,  has not, employed or retained any company or person (other than a full-time bona fide employee working solely for the bidder) to solicit or secure this contract, and (b) he  has,  has not, paid or agreed to pay any company or person (other than a full-time bona fide employee working solely for the bidder) any fee, commission, percentage or brokerage fee, contingent upon or resulting from the award of this contract; and agrees to furnish information relating to (a) and (b) above as requested by the Contracting Officer. (For interpretation of the representation, including the term "bona fide employee," see Code of Federal Regulations, Title 41, Subpart 1-1.5.)

**4. TYPE OF ORGANIZATION**

He operates as an  individual,  partnership,  joint venture,  corporation, incorporated in State of

**5. INDEPENDENT PRICE DETERMINATION**

(a) By submission of this bid, each bidder certifies, and in the case of a joint bid each party thereto certifies as to his own organization, that in connection with this procurement:

(1) The prices in this bid have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;

(2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, in the case of a bid, or prior to award, in the case of a proposal, directly or indirectly to any other bidder or to any competitor; and

(3) No attempt has been made or will be made by the bidder to induce any other person or firm to submit or not to submit a bid for the purpose of restricting competition.

(b) Each person signing this bid certifies that:

(1) He is the person in the bidder's organization responsible within that organization for the decision as to the prices being bid herein and that he has not participated, and will not participate, in any action contrary to (a)(1) through (a)(3) above; or

(2) (i) He is not the person in the bidder's organization responsible within that organization for the decision as to the prices being bid herein but that he has been authorized in writing to act as agent for the persons responsible for such decision in certifying that such persons have not participated, and will not participate, in any action contrary to (a)(1) through (a)(3) above, and as their agent does hereby so certify; and (ii) he has not participated, and will not participate, in any action contrary to (a)(1) through (a)(3) above.

(c) This certification is not applicable to a foreign bidder submitting a bid for a contract which requires performance or delivery outside the United States, its possessions, and Puerto Rico.

(d) A bid will not be considered for award where (a)(1), (a)(3), or (b) above, has been deleted or modified. Where (a)(2) above, has been deleted or modified, the bid will not be considered for award unless the bidder furnishes with the bid a signed statement which sets forth in detail the circumstances of the disclosure and the head of the agency, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

NOTE.—Bids must set forth full, accurate, and complete information as required by this invitation for bids (including attachments). The penalty for making false statements in bids is prescribed in 18 U.S.C. 1001.

**THE FOLLOWING NEED BE CHECKED ONLY IF BID EXCEEDS \$10,000 IN AMOUNT.**

**6. EQUAL OPPORTUNITY**

He  has,  has not, participated in a previous contract or subcontract subject to the Equal Opportunity Clause herein, the clause originally contained in Section 301 of Executive Order No. 10925, or the clause contained in Section 201 of Executive Order No. 11114; he  has,  has not, filed all required compliance reports; and representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained prior to subcontract awards.

(The above representations need not be submitted in connection with contracts or subcontracts which are exempt from the equal opportunity clause.)

**7. PARENT COMPANY AND EMPLOYER IDENTIFICATION NUMBER**

*Each bidder shall furnish the following information by filling in the appropriate blocks:*

(a) Is the bidder owned or controlled by a parent company as described below?  Yes  No. (For the purpose of this bid, a parent company is defined as one which either owns or controls the activities and basic business policies of the bidder. To own another company means the parent company must own at least a majority (more than 50 percent) of the voting rights in that company. To control another company, such ownership is not required; if another company is able to formulate, determine, or veto basic business policy decisions of the bidder, such other company is considered the parent company of the bidder. This control may be exercised through the use of dominant minority voting rights, use of proxy voting, contractual arrangements, or otherwise.)

(b) If the answer to (a) above is "Yes," bidder shall insert in the space below the name and main office address of the parent company.

NAME OF PARENT COMPANY	MAIN OFFICE ADDRESS (No., Street, City, State, and ZIP Code)
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(c) Bidder shall insert in the applicable space below, if he has no parent company, his own Employer's Identification Number (E.I. No.) (Federal Social Security Number used on Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941), or, if he has a parent company, the E.I. No. of his parent company.

EMPLOYER IDENTIFICATION NUMBER OF		PARENT COMPANY	BIDDER
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**8. CERTIFICATION OF NONSEGREGATED FACILITIES**

(Applicable to (1) contracts, (2) subcontracts, and (3) agreements with applicants who are themselves performing federally assisted construction contracts, exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause.)

By the submission of this bid, the bidder, offeror, applicant, or subcontractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. He certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The bidder, offeror, applicant, or subcontractor agrees that a breach of this certification is a violation of the Equal Opportunity clause in this contract. As used in this certification, the term "segregated facilities" 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 which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. He further agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause; that he will retain such certifications in his files; and that he will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods):

**NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES**

A Certification of Nonsegregated Facilities must be submitted prior to the award of a subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

**9. CLEAN AIR AND WATER**

(Applicable if the bid or offer exceeds \$100,000, or the contracting officer has determined that orders under an indefinite quantity contract in any year will exceed \$100,000, or a facility to be used has been the subject of a conviction under the Clean Air Act (42 U.S.C. 1857c-8(c)(1)) or the Federal Water Pollution Control Act (33 U.S.C. 1319(c)) and is listed by EPA, or is not otherwise exempt.)

The bidder or offeror certifies as follows:

(a) Any facility to be utilized in the performance of this proposed contract has , has not , been listed on the Environmental Protection Agency List of Violating Facilities.

(b) He will promptly notify the contracting officer, prior to award, of the receipt of any communication from the Director, Office of Federal Activities, Environmental Protection Agency, indicating that any facility which he proposes to use for the performance of the contract is under consideration to be listed on the EPA List of Violating Facilities.

(c) He will include substantially this certification, including this paragraph (c), in every nonexempt subcontract.

APPENDIX "A"  
to  
STANDARD FORM 19-B

August 1980

WOMAN OWNED BUSINESS (1978 SEP)

The offeror represents that the firm submitting this offer ( ) is, ( ) is not, a woman owned business. A woman-owned business is a business which is, at least, 51 percent owned, controlled and operated by a woman or women. Controlled is defined as exercising the power to make policy decisions. Operated is defined as actively involved in the day-to-day management. For the purposes of this definition, businesses which are publicly owned, joint stock associations and business trusts are exempted. Exempted businesses may voluntarily represent that they are or are not, women-owned if this information is available.

PERCENT FOREIGN CONTENT (1978 SEP)

Approximately \_\_\_\_\_ percent of the proposed contract price represents foreign content or effort.

SMALL DISADVANTAGED BUSINESS CONCERN (1980 AUG)

(a) The offeror represents that he ( ) is, ( ) is not, a small business concern owned and controlled by socially and economically disadvantaged individuals. The term "small business concern" means a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto. The term "small business concern owned and controlled by socially and economically disadvantaged individuals" means a small business concern -

- (1) that is at least 51 per centum owned by one or more socially and economically disadvantaged individuals; or, in the case of any publicly owned business, at least 51 per centum of the stock of which is owned by one or more socially and economically disadvantaged individuals; and
- (2) whose management and daily business operations are controlled by one or more such individuals.

(b) The offeror shall presume that socially and economically disadvantaged individuals include Black Americans, Hispanic Americans, Native Americans (i.e. American Indians, Eskimos, Aleuts, and Native Hawaiians), Asian-Pacific Americans (i.e. U. S. citizens whose origins are from Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U. S. Trust Territories of the Pacific, Northern Marianas, Laos, Cambodia, and Taiwan), and other minorities or any other individuals found to be disadvantaged by the Small Business Administration pursuant to Section 8(a) of the Small Business Act.

EQUAL EMPLOYMENT COMPLIANCE (1978 SEP)

By submission of this offer, the offeror represents that, to the best of his knowledge and belief, except as noted below, up to the date of this offer no written notice such as a show cause letter, a letter indicating probable cause, or any other written notification citing specific deficiencies, has been received by the offeror from any Federal Government agency or representative thereof that the offeror or any of its divisions or affiliates or known first-tier subcontractors is in violation of any of the provisions of Executive Order 11246 of September 24, 1965, as amended, or rules and regulations of the Secretary of Labor (41 CFR, Chapter 60) and specifically as to not having an acceptable affirmative action compliance program or being in noncompliance with any other aspect of the Equal Employment Opportunity Program. It is further agreed

APPENDIX "A"  
to  
STANDARD FORM 19-B

August 1980

that should there be any change (i) in the offeror's status or circumstances between this date and the date of expiration of this offer or any extension thereof, or (ii) during any contract or extension thereof resulting from this solicitation, the Contracting Officer will be notified promptly.

The bidder's Dun and Bradstreet, Incorporated Data Universal Numbering System No. is \_\_\_\_\_.

PREFERENCE FOR LABOR SURPLUS AREA CONCERNS (1978 JUN)

This procurement is not set aside for labor surplus area concerns. However, the offeror's status as such a concern may affect entitlement to award in case of tie offers or offer evaluation in accordance with the Buy American clause of this solicitation. In order to have entitlement to a preference determined if those circumstances should apply, the offeror must identify below the labor surplus area in which the costs he will incur on account of manufacturing or production (by himself or his first-tier subcontractors) amount to more than fifty percent (50%) of the contract price.

\_\_\_\_\_

\_\_\_\_\_

Failure to identify the locations as specified above will preclude consideration of the offeror as a labor surplus area concern. Offeror agrees that if, as a labor surplus area concern, he is awarded a contract for which he would not have qualified in the absence of such status, he will perform the contract or cause it to be performed, in accordance with the obligations which such status entails.

**REPRESENTATIONS AND CERTIFICATIONS****(Construction and Architect-Engineer Contract)****(For use with Standard Forms 19, 21 and 252)**

REFERENCE (Enter same No.(s) as on SF 19, 21 and 252)

NAME AND ADDRESS OF BIDDER (No., Street, City, State, and ZIP Code)

DATE OF BID

*In negotiated procurements, "bid" and "bidder" shall be construed to mean "offer" and "offeror."*

The bidder makes the following representations and certifications as a part of the bid identified above. (Check appropriate boxes.)

**1. SMALL BUSINESS**

He  is,  is not, a small business concern. (A small business concern for the purpose of Government procurement is a concern, including its affiliates, which is independently owned and operated, is not dominant in the field of operations in which it is bidding on Government contracts, and can further qualify under the criteria concerning number of employees, average annual receipts, or other criteria as prescribed by the Small Business Administration. For additional information see governing regulations of the Small Business Administration (13 CFR Part 121)).

**2. MINORITY BUSINESS ENTERPRISE**

He  is,  is not a minority business enterprise. A minority business enterprise is defined as a "business, at least 50 percent of which is owned by minority group members or, in case of publicly owned businesses, at least 51 percent of the stock of which is owned by minority group members." For the purpose of this definition, minority group members are Negroes, Spanish-speaking American persons, American-Orientals, American-Indians, American-Eskimos, and American-Aleuts."

**3. CONTINGENT FEE**

(a) He  has,  has not, employed or retained any company or person (other than a full-time bona fide employee working solely for the bidder) to solicit or secure this contract, and (b) he  has,  has not, paid or agreed to pay any company or person (other than a full-time bona fide employee working solely for the bidder) any fee, commission, percentage or brokerage fee, contingent upon or resulting from the award of this contract; and agrees to furnish information relating to (a) and (b) above as requested by the Contracting Officer. (For interpretation of the representation, including the term "bona fide employee," see Code of Federal Regulations, Title 41, Subpart 1-1.5.)

**4. TYPE OF ORGANIZATION**

He operates as an  individual,  partnership,  joint venture,  corporation, incorporated in State of \_\_\_\_\_

**5. INDEPENDENT PRICE DETERMINATION**

(a) By submission of this bid, each bidder certifies, and in the case of a joint bid each party thereto certifies as to his own organization, that in connection with this procurement:

(1) The prices in this bid have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;

(2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, in the case of a bid, or prior to award, in the case of a proposal, directly or indirectly to any other bidder or to any competitor; and

(3) No attempt has been made or will be made by the bidder to induce any other person or firm to submit or not to submit a bid for the purpose of restricting competition.

(b) Each person signing this bid certifies that:

(1) He is the person in the bidder's organization responsible within that organization for the decision as to the prices being bid herein and that he has not participated, and will not participate, in any action contrary to (a) (1) through (a) (3) above; or

(2) (i) He is not the person in the bidder's organization responsible within that organization for the decision as to the prices being bid herein but that he has been authorized in writing to act as agent for the persons responsible for such decision in certifying that such persons have not participated, and will not participate, in any action contrary to (a) (1) through (a) (3) above, and as their agent does hereby so certify; and (ii) he has not participated, and will not participate, in any action contrary to (a) (1) through (a) (3) above.

(c) This certification is not applicable to a foreign bidder submitting a bid for a contract which requires performance or delivery outside the United States, its possessions, and Puerto Rico.

(d) A bid will not be considered for award where (a) (1), (a) (3), or (b) above, has been deleted or modified. Where (a) (2) above, has been deleted or modified, the bid will not be considered for award unless the bidder furnishes with the bid a signed statement which sets forth in detail the circumstances of the disclosure and the head of the agency, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

NOTE.—Bids must set forth full, accurate, and complete information as required by this invitation for bids (including attachments). The penalty for making false statements in bids is prescribed in 18 U.S.C. 1001.

THE FOLLOWING NEED BE CHECKED ONLY IF BID EXCEEDS \$10,000 IN AMOUNT.

6. EQUAL OPPORTUNITY

He  has,  has not, participated in a previous contract or subcontract subject to the Equal Opportunity Clause herein, the clause originally contained in Section 301 of Executive Order No. 10925, or the clause contained in Section 201 of Executive Order No. 11114; he  has,  has not, filed all required compliance reports; and representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained prior to subcontract awards.

(The above representations need not be submitted in connection with contracts or subcontracts which are exempt from the equal opportunity clause.)

7. PARENT COMPANY AND EMPLOYER IDENTIFICATION NUMBER

Each bidder shall furnish the following information by filling in the appropriate blocks:

(a) Is the bidder owned or controlled by a parent company as described below?  Yes  No. (For the purpose of this bid, a parent company is defined as one which either owns or controls the activities and basic business policies of the bidder. To own another company means the parent company must own at least a majority (more than 50 percent) of the voting rights in that company. To control another company, such ownership is not required; if another company is able to formulate, determine, or veto basic business policy decisions of the bidder, such other company is considered the parent company of the bidder. This control may be exercised through the use of dominant minority voting rights, use of proxy voting, contractual arrangements, or otherwise.)

(b) If the answer to (a) above is "Yes," bidder shall insert in the space below the name and main office address of the parent company.

NAME OF PARENT COMPANY	MAIN OFFICE ADDRESS (No., Street, City, State, and ZIP Code)
------------------------	--

(c) Bidder shall insert in the applicable space below, if he has no parent company, his own Employer's Identification Number (E.I. No.) (Federal Social Security Number used on Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941), or, if he has a parent company, the E.I. No. of his parent company.

EMPLOYER IDENTIFICATION NUMBER OF		PARENT COMPANY	BIDDER
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8. CERTIFICATION OF NONSEGREGATED FACILITIES

(Applicable to (1) contracts, (2) subcontracts, and (3) agreements with applicants who are themselves performing federally assisted construction contracts, exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause.)

By the submission of this bid, the bidder, offeror, applicant, or subcontractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. He certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The bidder, offeror, applicant, or subcontractor agrees that a breach of this certification is a violation of the Equal Opportunity clause in this contract. As used in this certification, the term "segregated facilities" 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 which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. He further agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontractors exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause; that he will retain such certifications in his files; and that he will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods):

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES

A Certification of Nonsegregated Facilities must be submitted prior to the award of a subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

9. CLEAN AIR AND WATER

(Applicable if the bid or offer exceeds \$100,000, or the contracting officer has determined that orders under an indefinite quantity contract in any year will exceed \$100,000, or a facility to be used has been the subject of a conviction under the Clean Air Act (42 U.S.C. 1857c-8(c)(1)) or the Federal Water Pollution Control Act (33 U.S.C. 1319(c)) and is listed by EPA, or is not otherwise exempt.)

The bidder or offeror certifies as follows:

(a) Any facility to be utilized in the performance of this proposed contract has , has not , been listed on the Environmental Protection Agency List of Violating Facilities.

(b) He will promptly notify the contracting officer, prior to award, of the receipt of any communication from the Director, Office of Federal Activities, Environmental Protection Agency, indicating that any facility which he proposes to use for the performance of the contract is under consideration to be listed on the EPA List of Violating Facilities.

(c) He will include substantially this certification, including this paragraph (c), in every nonexempt subcontract.

APPENDIX "A"  
to  
STANDARD FORM 19-B

August 1980

WOMAN OWNED BUSINESS (1978 SEP)

The offeror represents that the firm submitting this offer ( ) is, ( ) is not, a woman owned business. A woman-owned business is a business which is, at least, 51 percent owned, controlled and operated by a woman or women. Controlled is defined as exercising the power to make policy decisions. Operated is defined as actively involved in the day-to-day management. For the purposes of this definition, businesses which are publicly owned, joint stock associations and business trusts are exempted. Exempted businesses may voluntarily represent that they are or are not, women-owned if this information is available.

PERCENT FOREIGN CONTENT (1978 SEP)

Approximately \_\_\_\_\_ percent of the proposed contract price represents foreign content or effort.

SMALL DISADVANTAGED BUSINESS CONCERN (1980 AUG)

(a) The offeror represents that he ( ) is, ( ) is not, a small business concern owned and controlled by socially and economically disadvantaged individuals. The term "small business concern" means a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto. The term "small business concern owned and controlled by socially and economically disadvantaged individuals" means a small business concern -

(1) that is at least 51 per centum owned by one or more socially and economically disadvantaged individuals; or, in the case of any publicly owned business, at least 51 per centum of the stock of which is owned by one or more socially and economically disadvantaged individuals; and

(2) whose management and daily business operations are controlled by one or more such individuals.

(b) The offeror shall presume that socially and economically disadvantaged individuals include Black Americans, Hispanic Americans, Native Americans (i.e. American Indians, Eskimos, Aleuts, and Native Hawaiians), Asian-Pacific Americans (i.e. U. S. citizens whose origins are from Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U. S. Trust Territories of the Pacific, Northern Marianas, Laos, Cambodia, and Taiwan), and other minorities or any other individuals found to be disadvantaged by the Small Business Administration pursuant to Section 8(a) of the Small Business Act.

EQUAL EMPLOYMENT COMPLIANCE (1978 SEP)

By submission of this offer, the offeror represents that, to the best of his knowledge and belief, except as noted below, up to the date of this offer no written notice such as a show cause letter, a letter indicating probable cause, or any other written notification citing specific deficiencies, has been received by the offeror from any Federal Government agency or representative thereof that the offeror or any of its divisions or affiliates or known first-tier subcontractors is in violation of any of the provisions of Executive Order 11246 of September 24, 1965, as amended, or rules and regulations of the Secretary of Labor (41 CFR, Chapter 60) and specifically as to not having an acceptable affirmative action compliance program or being in noncompliance with any other aspect of the Equal Employment Opportunity Program. It is further agreed

to  
STANDARD FORM 19-B

that should there be any change (i) in the offeror's status or circumstances between this date and the date of expiration of this offer or any extension thereof, or (ii) during any contract or extension thereof resulting from this solicitation, the Contracting Officer will be notified promptly.

The bidder's Dun and Bradstreet, Incorporated Data Universal Numbering System No. is \_\_\_\_\_

PREFERENCE FOR LABOR SURPLUS AREA CONCERNS (1978 JUN)

This procurement is not set aside for labor surplus area concerns. However, the offeror's status as such a concern may affect entitlement to award in case of tie offers or offer evaluation in accordance with the Buy American clause of this solicitation. In order to have entitlement to a preference determined if those circumstances should apply, the offeror must identify below the labor surplus area in which the costs he will incur on account of manufacturing or production (by himself or his first-tier subcontractors) amount to more than fifty percent (50%) of the contract price.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Failure to identify the locations as specified above will preclude consideration of the offeror as a labor surplus area concern. Offeror agrees that if, as a labor surplus area concern, he is awarded a contract for which he would not have qualified in the absence of such status, he will perform the contract or cause it to be performed, in accordance with the obligations which such status entails.

**REPRESENTATIONS AND CERTIFICATIONS****(Construction and Architect-Engineer Contract)****(For use with Standard Forms 19, 21 and 252)**

REFERENCE (Enter same No.(s) as on SF 19, 21 and 252)

NAME AND ADDRESS OF BIDDER (No., Street, City, State, and ZIP Code)

DATE OF BID

*In negotiated procurements, "bid" and "bidder" shall be construed to mean "offer" and "offeror."*

The bidder makes the following representations and certifications as a part of the bid identified above. (Check appropriate boxes.)

**1. SMALL BUSINESS**

He  is,  is not, a small business concern. (A small business concern for the purpose of Government procurement is a concern, including its affiliates, which is independently owned and operated; is not dominant in the field of operations in which it is bidding on Government contracts, and can further qualify under the criteria concerning number of employees, average annual receipts, or other criteria as prescribed by the Small Business Administration. For additional information see governing regulations of the Small Business Administration (13 CFR Part 121)).

**2. MINORITY BUSINESS ENTERPRISE**

He  is,  is not a minority business enterprise. A minority business enterprise is defined as a "business, at least 50 percent of which is owned by minority group members or, in case of publicly owned businesses, at least 51 percent of the stock of which is owned by minority group members." For the purpose of this definition, minority group members are Negroes, Spanish-speaking American persons, American-Orientals, American-Indians, American-Eskimos, and American-Aleuts."

**3. CONTINGENT FEE**

(a) He  has,  has not, employed or retained any company or person (other than a full-time bona fide employee working solely for the bidder) to solicit or secure this contract, and (b) he  has,  has not, paid or agreed to pay any company or person (other than a full-time bona fide employee working solely for the bidder) any fee, commission, percentage or brokerage fee, contingent upon or resulting from the award of this contract; and agrees to furnish information relating to (a) and (b) above as requested by the Contracting Officer. (For interpretation of the representation, including the term "bona fide employee," see Code of Federal Regulations, Title 41, Subpart 1-1.5.)

**4. TYPE OF ORGANIZATION**

He operates as an  individual,  partnership,  joint venture,  corporation, incorporated in State of \_\_\_\_\_

**5. INDEPENDENT PRICE DETERMINATION**

(a) By submission of this bid, each bidder certifies, and in the case of a joint bid each party thereto certifies as to his own organization, that in connection with this procurement:

(1) The prices in this bid have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;

(2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, in the case of a bid, or prior to award, in the case of a proposal, directly or indirectly to any other bidder or to any competitor; and

(3) No attempt has been made or will be made by the bidder to induce any other person or firm to submit or not to submit a bid for the purpose of restricting competition.

(b) Each person signing this bid certifies that:

(1) He is the person in the bidder's organization responsible within that organization for the decision as to the prices being bid herein and that he has not participated, and will not participate, in any action contrary to (a) (1) through (a) (3) above; or

(2) (i) He is not the person in the bidder's organization responsible within that organization for the decision as to the prices being bid herein but that he has been authorized in writing to act as agent for the persons responsible for such decision in certifying that such persons have not participated, and will not participate, in any action contrary to (a) (1) through (a) (3) above, and as their agent does hereby so certify; and (ii) he has not participated, and will not participate, in any action contrary to (a) (1) through (a) (3) above.

(c) This certification is not applicable to a foreign bidder submitting a bid for a contract which requires performance or delivery outside the United States, its possessions, and Puerto Rico.

(d) A bid will not be considered for award where (a) (1), (a) (3), or (b) above, has been deleted or modified. Where (a) (2) above, has been deleted or modified, the bid will not be considered for award unless the bidder furnishes with the bid a signed statement which sets forth in detail the circumstances of the disclosure and the head of the agency, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

NOTE.—Bids must set forth full, accurate, and complete information as required by this invitation for bids (including attachments). The penalty for making false statements in bids is prescribed in 18 U.S.C. 1001.

**THE FOLLOWING NEED BE CHECKED ONLY IF BID EXCEEDS \$10,000 IN AMOUNT.**

**6. EQUAL OPPORTUNITY**

He  has,  has not, participated in a previous contract or subcontract subject to the Equal Opportunity Clause herein, the clause originally contained in Section 301 of Executive Order No. 10925, or the clause contained in Section 201 of Executive Order No. 11114; he  has,  has not, filed all required compliance reports; and representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained prior to subcontract awards.

(The above representations need not be submitted in connection with contracts or subcontracts which are exempt from the equal opportunity clause.)

**7. PARENT COMPANY AND EMPLOYER IDENTIFICATION NUMBER**

Each bidder shall furnish the following information by filling in the appropriate blocks:

(a) Is the bidder owned or controlled by a parent company as described below?  Yes  No. (For the purpose of this bid, a parent company is defined as one which either owns or controls the activities and basic business policies of the bidder. To own another company means the parent company must own at least a majority (more than 50 percent) of the voting rights in that company. To control another company, such ownership is not required; if another company is able to formulate, determine, or veto basic business policy decisions of the bidder, such other company is considered the parent company of the bidder. This control may be exercised through the use of dominant minority voting rights, use of proxy voting, contractual arrangements, or otherwise.)

(b) If the answer to (a) above is "Yes," bidder shall insert in the space below the name and main office address of the parent company.

NAME OF PARENT COMPANY	MAIN OFFICE ADDRESS (No., Street, City, State, and ZIP Code)
------------------------	--

(c) Bidder shall insert in the applicable space below, if he has no parent company, his own Employer's Identification Number (E.I. No.) (Federal Social Security Number used on Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941), or, if he has a parent company, the E.I. No. of his parent company.

EMPLOYER IDENTIFICATION NUMBER OF	▶ PARENT COMPANY	BIDDER
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**8. CERTIFICATION OF NONSEGREGATED FACILITIES**

(Applicable to (1) contracts, (2) subcontracts, and (3) agreements with applicants who are themselves performing federally assisted construction contracts, exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause.)

By the submission of this bid, the bidder, offeror, applicant, or subcontractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. He certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The bidder, offeror, applicant, or subcontractor agrees that a breach of this certification is a violation of the Equal Opportunity clause in this contract. As used in this certification, the term "segregated facilities" 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 which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. He further agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause; that he will retain such certifications in his files; and that he will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods):

**NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES**

A Certification of Nonsegregated Facilities must be submitted prior to the award of a subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

**9. CLEAN AIR AND WATER**

(Applicable if the bid or offer exceeds \$100,000, or the contracting officer has determined that orders under an indefinite quantity contract in any year will exceed \$100,000, or a facility to be used has been the subject of a conviction under the Clean Air Act (42 U.S.C. 1857c-8(c)(1)) or the Federal Water Pollution Control Act (33 U.S.C. 1319(c)) and is listed by EPA, or is not otherwise exempt.)

The bidder or offeror certifies as follows:

(a) Any facility to be utilized in the performance of this proposed contract has , has not , been listed on the Environmental Protection Agency List of Violating Facilities.

(b) He will promptly notify the contracting officer, prior to award, of the receipt of any communication from the Director, Office of Federal Activities, Environmental Protection Agency, indicating that any facility which he proposes to use for the performance of the contract is under consideration to be listed on the EPA List of Violating Facilities.

(c) He will include substantially this certification, including this paragraph (c), in every nonexempt subcontract.

APPENDIX "A"  
to  
STANDARD FORM 19-B

August 1980

WOMAN OWNED BUSINESS (1978 SEP)

The offeror represents that the firm submitting this offer ( ) is, ( ) is not, a woman owned business. A woman-owned business is a business which is, at least, 51 percent owned, controlled and operated by a woman or women. Controlled is defined as exercising the power to make policy decisions. Operated is defined as actively involved in the day-to-day management. For the purposes of this definition, businesses which are publicly owned, joint stock associations and business trusts are exempted. Exempted businesses may voluntarily represent that they are or are not, women-owned if this information is available.

PERCENT FOREIGN CONTENT (1978 SEP)

Approximately \_\_\_\_\_ percent of the proposed contract price represents foreign content or effort.

SMALL DISADVANTAGED BUSINESS CONCERN (1980 AUG)

(a) The offeror represents that he ( ) is, ( ) is not, a small business concern owned and controlled by socially and economically disadvantaged individuals. The term "small business concern" means a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto. The term "small business concern owned and controlled by socially and economically disadvantaged individuals" means a small business concern -

(1) that is at least 51 per centum owned by one or more socially and economically disadvantaged individuals; or, in the case of any publicly owned business, at least 51 per centum of the stock of which is owned by one or more socially and economically disadvantaged individuals; and

(2) whose management and daily business operations are controlled by one or more such individuals.

(b) The offeror shall presume that socially and economically disadvantaged individuals include Black Americans, Hispanic Americans, Native Americans (i.e. American Indians, Eskimos, Aleuts, and Native Hawaiians), Asian-Pacific Americans (i.e. U. S. citizens whose origins are from Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U. S. Trust Territories of the Pacific, Northern Marianas, Laos, Cambodia, and Taiwan), and other minorities or any other individuals found to be disadvantaged by the Small Business Administration pursuant to Section 8(a) of the Small Business Act.

EQUAL EMPLOYMENT COMPLIANCE (1978 SEP)

By submission of this offer, the offeror represents that, to the best of his knowledge and belief, except as noted below, up to the date of this offer no written notice such as a show cause letter, a letter indicating probable cause, or any other written notification citing specific deficiencies, has been received by the offeror from any Federal Government agency or representative thereof that the offeror or any of its divisions or affiliates or known first-tier subcontractors is in violation of any of the provisions of Executive Order 11246 of September 24, 1965, as amended, or rules and regulations of the Secretary of Labor (41 CFR, Chapter 60) and specifically as to not having an acceptable affirmative action compliance program or being in noncompliance with any other aspect of the Equal Employment Opportunity Program. It is further agreed

APPENDIX "A"  
to  
STANDARD FORM 19-B

August 1980

that should there be any change (i) in the offeror's status or circumstances between this date and the date of expiration of this offer or any extension thereof, or (ii) during any contract or extension thereof resulting from this solicitation, the Contracting Officer will be notified promptly.

The bidder's Dun and Bradstreet, Incorporated Data Universal Numbering System No. is \_\_\_\_\_.

PREFERENCE FOR LABOR SURPLUS AREA CONCERNS (1978 JUN)

This procurement is not set aside for labor surplus area concerns. However, the offeror's status as such a concern may affect entitlement to award in case of tie offers or offer evaluation in accordance with the Buy American clause of this solicitation. In order to have entitlement to a preference determined if those circumstances should apply, the offeror must identify below the labor surplus area in which the costs he will incur on account of manufacturing or production (by himself or his first-tier subcontractors) amount to more than fifty percent (50%) of the contract price.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Failure to identify the locations as specified above will preclude consideration of the offeror as a labor surplus area concern. Offeror agrees that if, as a labor surplus area concern, he is awarded a contract for which he would not have qualified in the absence of such status, he will perform the contract or cause it to be performed, in accordance with the obligations which such status entails.

**BID BOND**  
 (See Instructions on reverse)

24-103

DATE BOND EXECUTED (Must not be later than bid opening date)

PRINCIPAL (Legal name and business address)

TYPE OF ORGANIZATION ("X" one)

- INDIVIDUAL       PARTNERSHIP  
 JOINT VENTURE       CORPORATION

STATE OF INCORPORATION

SURETY(IES) (Name and business address)

PENAL SUM OF BOND				BID IDENTIFICATION		
PERCENT OF BID PRICE	AMOUNT NOT TO EXCEED				BID DATE	INVITATION NO.
	MILLION(S)	THOUSAND(S)	HUNDRED(S)	CENTS		
					FOR (Construction, Supplies or Services)	

KNOW ALL MEN BY THESE PRESENTS, That we, the Principal and Surety(ies) hereto, are firmly bound to the United States of America (hereinafter called the Government) in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally: *Provided*, That, where the Sureties are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the bid identified above.

NOW, THEREFORE, if the Principal, upon acceptance by the Government of his bid identified above, within the period specified therein for acceptance (sixty (60) days if no period is specified), shall execute such further contractual documents, if any, and give such bond(s) as may be required by the terms of the bid as accepted within the time specified (ten (10) days if no period is specified) after receipt of the forms by him, or in the event of failure so to execute such further contractual documents and give such bonds, if the Principal shall pay the Government for any cost of procuring the work which exceeds the amount of his bid, then the above obligation shall be void and of no effect.

Each Surety executing this instrument hereby agrees that its obligation shall not be impaired by any extension of the time for acceptance of the bid that the Principal may grant to the Government, notice of which extension to the Surety(ies) being hereby waived; provided that such waiver of notice shall apply only with respect to extensions aggregating not more than sixty (60) calendar days in addition to the period originally allowed for acceptance of the bid.

IN WITNESS WHEREOF, the Principal and Surety(ies) have executed this bid bond and have affixed their seals on the date set forth above.

PRINCIPAL						
Signature(s)	1.			2.		
		(Seal)			(Seal)	
Name(s) & Title(s) (Typed)	1.			2.		
					Corporate Seal	
INDIVIDUAL SURETIES						
Signature(s)	1.			2.		
		(Seal)			(Seal)	
Name(s) (Typed)	1.			2.		
CORPORATE SURETY(IES)						
SURETY A	Name & Address				STATE OF INC.	LIABILITY LIMIT
	Signature(s)	1.			2.	
	Name(s) & Title(s) (Typed)	1.			2.	
					Corporate Seal	

**CORPORATE SURETY(IES) (Continued)**

<b>SURETY B</b>	Name & Address		STATE OF INC.	LIABILITY LIMIT	<i>Corporate Seal</i>
	Signature(s)	1.	2.		
	Name(s) & Title(s) (Typed)	1.	2.		
<b>SURETY C</b>	Name & Address		STATE OF INC.	LIABILITY LIMIT	<i>Corporate Seal</i>
	Signature(s)	1.	2.		
	Name(s) & Title(s) (Typed)	1.	2.		
<b>SURETY D</b>	Name & Address		STATE OF INC.	LIABILITY LIMIT	<i>Corporate Seal</i>
	Signature(s)	1.	2.		
	Name(s) & Title(s) (Typed)	1.	2.		
<b>SURETY E</b>	Name & Address		STATE OF INC.	LIABILITY LIMIT	<i>Corporate Seal</i>
	Signature(s)	1.	2.		
	Name(s) & Title(s) (Typed)	1.	2.		
<b>SURETY F</b>	Name & Address		STATE OF INC.	LIABILITY LIMIT	<i>Corporate Seal</i>
	Signature(s)	1.	2.		
	Name(s) & Title(s) (Typed)	1.	2.		
<b>SURETY G</b>	Name & Address		STATE OF INC.	LIABILITY LIMIT	<i>Corporate Seal</i>
	Signature(s)	1.	2.		
	Name(s) & Title(s) (Typed)	1.	2.		

**INSTRUCTIONS**

1. This form is authorized for use whenever a bid guaranty is required in connection with construction work or the furnishing of supplies or services. There shall be no deviation from this form without approval by the Administrator of General Services.

2. The full legal name and business address of the Principal shall be inserted in the space designated "Principal" on the face of this form. The bond shall be signed by an authorized person. Where such person is signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of his authority must be furnished.

3. The penal sum of the bond may be expressed as a percentage of the bid price if desired. In such cases, a maximum dollar limitation may be stipulated (e.g., 20% of the bid price but the amount not to exceed \_\_\_\_\_ dollars).

4. (a) Corporations executing the bond as sureties must be among those appearing on the Treasury Department's list of approved sureties and must be acting within

the limitations set forth therein. Where more than a single corporate surety is involved, their names and addresses (city and State) shall be inserted in the spaces (Surety A, Surety B, etc.) headed "CORPORATE SURETY(IES)", and in the space designated "SURETY(IES)" on the face of this form only the letter identification of the Sureties shall be inserted.

(b) Where individual sureties execute the bond, they shall be two or more responsible persons. A completed Affidavit of Individual Surety (Standard Form 28), for each individual surety, shall accompany the bond. Such sureties may be required to furnish additional substantiating information concerning their assets and financial capability as the Government may require.

5. Corporations executing the bond shall affix their corporate seals. Individuals shall execute the bond opposite the word "Seal"; and, if executed in Maine or New Hampshire, shall also affix an adhesive seal.

6. The name of each person signing this bid bond should be typed in the space provided.

**BID BOND**  
 (See Instructions on reverse)

24-103

DATE BOND EXECUTED (Must not be later than bid opening date)

PRINCIPAL (Legal name and business address)

TYPE OF ORGANIZATION ("X" one)

- INDIVIDUAL       PARTNERSHIP  
 JOINT VENTURE       CORPORATION

STATE OF INCORPORATION

SURETY(IES) (Name and business address)

PENAL SUM OF BOND				BID IDENTIFICATION		
PERCENT OF BID PRICE	AMOUNT NOT TO EXCEED				BID DATE	INVITATION NO.
	MILLION(S)	THOUSAND(S)	HUNDRED(S)	CENTS		
					FOR (Construction, Supplies or Services)	

KNOW ALL MEN BY THESE PRESENTS, That we, the Principal and Surety (ies) hereto, are firmly bound to the United States of America (hereinafter called the Government) in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally: *Provided*, That, where the Sureties are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the bid identified above.

NOW, THEREFORE, if the Principal, upon acceptance by the Government of his bid identified above, within the period specified therein for acceptance (sixty (60) days if no period is specified), shall execute such further contractual documents, if any, and give such bond(s) as may be required by the terms of the bid as accepted within the time specified (ten (10) days if no period is specified) after receipt of the forms by him, or in the event of failure so to execute such further contractual documents and give such bonds, if the Principal shall pay the Government for any cost of procuring the work which exceeds the amount of his bid, then the above obligation shall be void and of no effect.

Each Surety executing this instrument hereby agrees that its obligation shall not be impaired by any extension of the time for acceptance of the bid that the Principal may grant to the Government, notice of which extension to the Surety(ies) being hereby waived; provided that such waiver of notice shall apply only with respect to extensions aggregating not more than sixty (60) calendar days in addition to the period originally allowed for acceptance of the bid.

IN WITNESS WHEREOF, the Principal and Surety(ies) have executed this bid bond and have affixed their seals on the date set forth above.

PRINCIPAL					
Signature(s)	1.			2.	Corporate Seal
		(Seal)		(Seal)	
Name(s) & Title(s) (Typed)	1.			2.	Corporate Seal
INDIVIDUAL SURETIES					
Signature(s)	1.			2.	(Seal)
		(Seal)		(Seal)	
Name(s) (Typed)	1.			2.	
CORPORATE SURETY(IES)					
SURETY A	Name & Address			STATE OF INC	LIABILITY LIMIT
	Signature(s)	1.			Corporate Seal
			2.		
Name(s) & Title(s) (Typed)	1.			2.	

CORPORATE SURETY(IES) (Continued)							
SURETY B	Name & Address				STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1.				2.	
	Name(s) & Title(s) (Typed)	1.				2.	
SURETY C	Name & Address				STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1.				2.	
	Name(s) & Title(s) (Typed)	1.				2.	
SURETY D	Name & Address				STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1.				2.	
	Name(s) & Title(s) (Typed)	1.				2.	
SURETY E	Name & Address				STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1.				2.	
	Name(s) & Title(s) (Typed)	1.				2.	
SURETY F	Name & Address				STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1.				2.	
	Name(s) & Title(s) (Typed)	1.				2.	
SURETY G	Name & Address				STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1.				2.	
	Name(s) & Title(s) (Typed)	1.				2.	

### INSTRUCTIONS

1. This form is authorized for use whenever a bid guaranty is required in connection with construction work or the furnishing of supplies or services. There shall be no deviation from this form without approval by the Administrator of General Services.

2. The full legal name and business address of the Principal shall be inserted in the space designated "Principal" on the face of this form. The bond shall be signed by an authorized person. Where such person is signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of his authority must be furnished.

3. The penal sum of the bond may be expressed as a percentage of the bid price if desired. In such cases, a maximum dollar limitation may be stipulated (e.g., 20% of the bid price but the amount not to exceed \_\_\_\_\_ dollars).

4. (a) Corporations executing the bond as sureties must be among those appearing on the Treasury Department's list of approved sureties and must be acting within

the limitations set forth therein. Where more than a single corporate surety is involved, their names and addresses (city and State) shall be inserted in the spaces (Surety A, Surety B, etc.) headed "CORPORATE SURETY (IES)", and in the space designated "SURETY (IES)" on the face of this form only the letter identification of the Sureties shall be inserted.

(b) Where individual sureties execute the bond, they shall be two or more responsible persons. A completed Affidavit of Individual Surety (Standard Form 28), for each individual surety, shall accompany the bond. Such sureties may be required to furnish additional substantiating information concerning their assets and financial capability as the Government may require.

5. Corporations executing the bond shall affix their corporate seals. Individuals shall execute the bond opposite the word "Seal"; and, if executed in Maine or New Hampshire, shall also affix an adhesive seal.

6. The name of each person signing this bid bond should be typed in the space provided.

**BID BOND**  
 (See Instructions on reverse)

24-103

DATE BOND EXECUTED (Must not be later than bid opening date)

PRINCIPAL (Legal name and business address)

TYPE OF ORGANIZATION ("X" one)

- INDIVIDUAL       PARTNERSHIP  
 JOINT VENTURE       CORPORATION

STATE OF INCORPORATION

SURETY(IES) (Name and business address)

PENAL SUM OF BOND				BID IDENTIFICATION		
PERCENT OF BID PRICE	AMOUNT NOT TO EXCEED				BID DATE	INVITATION NO.
	MILLION(S)	THOUSAND(S)	HUNDRED(S)	CENTS	FOR (Construction, Supplies or Services)	

KNOW ALL MEN BY THESE PRESENTS, That we, the Principal and Surety(ies) hereto, are firmly bound to the United States of America (hereinafter called the Government) in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally: *Provided*, That, where the Sureties are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the bid identified above.

NOW, THEREFORE, if the Principal, upon acceptance by the Government of his bid identified above, within the period specified therein for acceptance (sixty (60) days if no period is specified), shall execute such further contractual documents, if any, and give such bond(s) as may be required by the terms of the bid as accepted within the time specified (ten (10) days if no period is specified) after receipt of the forms by him, or in the event of failure so to execute such further contractual documents and give such bonds, if the Principal shall pay the Government for any cost of procuring the work which exceeds the amount of his bid, then the above obligation shall be void and of no effect.

Each Surety executing this instrument hereby agrees that its obligation shall not be impaired by any extension of the time for acceptance of the bid that the Principal may grant to the Government, notice of which extension to the Surety(ies) being hereby waived; provided that such waiver of notice shall apply only with respect to extensions aggregating not more than sixty (60) calendar days in addition to the period originally allowed for acceptance of the bid.

IN WITNESS WHEREOF, the Principal and Surety(ies) have executed this bid bond and have affixed their seals on the date set forth above.

PRINCIPAL					
Signature(s)	1.	2.			Corporate Seal
		(Seal)		(Seal)	
Name(s) & Title(s) (Typed)	1.	2.			
INDIVIDUAL SURETIES					
Signature(s)	1.	2.			(Seal)
		(Seal)			
Name(s) (Typed)	1.	2.			
CORPORATE SURETY(IES)					
SURETY A	Name & Address		STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1.	2.		
	Name(s) & Title(s) (Typed)	1.	2.		

CORPORATE SURETY(IES) (Continued)						
SURETY B	Name & Address			STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1.	2.			
	Name(s) & Title(s) (Typed)	1.	2.			
SURETY C	Name & Address			STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1.	2.			
	Name(s) & Title(s) (Typed)	1.	2.			
SURETY D	Name & Address			STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1.	2.			
	Name(s) & Title(s) (Typed)	1.	2.			
SURETY E	Name & Address			STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1.	2.			
	Name(s) & Title(s) (Typed)	1.	2.			
SURETY F	Name & Address			STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1.	2.			
	Name(s) & Title(s) (Typed)	1.	2.			
SURETY G	Name & Address			STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1.	2.			
	Name(s) & Title(s) (Typed)	1.	2.			

### INSTRUCTIONS

1. This form is authorized for use whenever a bid guaranty is required in connection with construction work or the furnishing of supplies or services. There shall be no deviation from this form without approval by the Administrator of General Services.

2. The full legal name and business address of the Principal shall be inserted in the space designated "Principal" on the face of this form. The bond shall be signed by an authorized person. Where such person is signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of his authority must be furnished.

3. The penal sum of the bond may be expressed as a percentage of the bid price if desired. In such cases, a maximum dollar limitation may be stipulated (e.g., 20% of the bid price but the amount not to exceed \_\_\_\_\_ dollars).

4. (a) Corporations executing the bond as sureties must be among those appearing on the Treasury Department's list of approved sureties and must be acting within

the limitations set forth therein. Where more than a single corporate surety is involved, their names and addresses (city and State) shall be inserted in the spaces (Surety A, Surety B, etc.) headed "CORPORATE SURETY(IES)", and in the space designated "SURETY(IES)" on the face of this form only the letter identification of the Sureties shall be inserted.

(b) Where individual sureties execute the bond, they shall be two or more responsible persons. A completed Affidavit of Individual Surety (Standard Form 28), for each individual surety, shall accompany the bond. Such sureties may be required to furnish additional substantiating information concerning their assets and financial capability as the Government may require.

5. Corporations executing the bond shall affix their corporate seals. Individuals shall execute the bond opposite the word "Seal"; and, if executed in Maine or New Hampshire, shall also affix an adhesive seal.

6. The name of each person signing this bid bond should be typed in the space provided.

STANDARD FORM 23  
JANUARY 1961 EDITION  
GENERAL SERVICES ADMINISTRATION  
FED. PROC. REG. (41 CFR) 1-16.401

# CONSTRUCTION CONTRACT

(See instructions on reverse)

CONTRACT NO.

DATE OF CONTRACT

NAME AND ADDRESS OF CONTRACTOR

CHECK APPROPRIATE BOX

- Individual
- Partnership
- Joint Venture
- Corporation, incorporated in the  
State of \_\_\_\_\_

DEPARTMENT OR AGENCY

CONTRACT FOR (*Work to be performed*)

PLACE

CONTRACT PRICE (*Express in words and figures*)

ADMINISTRATIVE DATA (*Optional*)

The United States of America (hereinafter called the Government), represented by the Contracting Officer executing this contract, and the individual, partnership, joint venture, or corporation named above (hereinafter called the Contractor), mutually agree to perform this contract in strict accordance with the General Provisions (Standard Form 23-A), Labor Standards Provisions Applicable to Contracts in Excess of \$2,000 (Standard Form 19-A), and the following designated specifications, schedules, drawings, and conditions:

WORK SHALL BE STARTED

WORK SHALL BE COMPLETED

*Alterations.* The following alterations were made in this contract before it was signed by the parties hereto:

In witness whereof, the parties hereto have executed this contract as of the date entered on the first page hereof.

THE UNITED STATES OF AMERICA

CONTRACTOR

By \_\_\_\_\_

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Official title)

By \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Title)

### INSTRUCTIONS

1. The full name and business address of the Contractor must be inserted in the space provided on the face of the form. The Contractor shall sign in the space provided above with his usual signature and typewrite or print his name under the signature.

2. An officer of a corporation, a member of a partnership, or an agent signing for the Contractor shall place his signature and title after the word "By" under the name of the Contractor. A contract executed by an attorney or agent on behalf of the Contractor shall be accompanied by two authenticated copies of his power of attorney or other evidence of his authority to act on behalf of the Contractor.

**PERFORMANCE BOND**  
 (See Instructions on reverse)

DATE BOND EXECUTED (Must be same or later than date of contract)

PRINCIPAL (Legal name and business address)

TYPE OF ORGANIZATION ("X" one)

- INDIVIDUAL       PARTNERSHIP  
 JOINT VENTURE       CORPORATION

STATE OF INCORPORATION

SURETY(IES) (Name(s) and business address(es))

PENAL SUM OF BOND

MILLION(S)	THOUSAND(S)	HUNDRED(S)	CENT(S)
------------	-------------	------------	---------

CONTRACT DATE

CONTRACT NO

KNOW ALL MEN BY THESE PRESENTS, That we, the Principal and Surety(ies) hereto, are firmly bound to the United States of America (hereinafter called the Government) in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally: *Provided*, That, where the Sureties are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal entered into the contract identified above;

NOW, THEREFORE, if the Principal shall:

(a) Perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the Government, with or without notice to the Surety(ies), and during the life of any guaranty required under the contract, and shall also perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the Surety(ies) being hereby waived; and

(b) If the said contract is subject to the Miller Act, as amended (40 U.S.C. 270a-270e), pay to the Government the full amount of the taxes imposed by the Government which are collected, deducted, or withheld from wages paid by the Principal in carrying out the construction contract with respect to which this bond is furnished; then the above obligation shall be void and of no effect.

IN WITNESS WHEREOF, the Principal and Surety(ies) have executed this performance bond and have affixed their seals on the date set forth above.

**PRINCIPAL**

Signature(s)	1.	2.	Corporate Seal
		(Seal)	
Name(s) & Title(s) (Typed)	1.	2.	

**INDIVIDUAL SURETY(IES)**

Signature(s)	1.	2.
		(Seal)
Name(s) (Typed)	1.	2.

**CORPORATE SURETY(IES)**

SURETY A	Name & Address	STATE OF INC	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1.	2.	
	Name(s) & Title(s) (Typed)	1.	2.	

CORPORATE SURETY(IES) (Continued)						
SURETY B	Name & Address			STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1	2			
	Name(s) & Title(s) (Typed)	1	2			
SURETY C	Name & Address			STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1	2			
	Name(s) & Title(s) (Typed)	1	2			
SURETY D	Name & Address			STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1	2			
	Name(s) & Title(s) (Typed)	1	2			
SURETY E	Name & Address			STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1	2			
	Name(s) & Title(s) (Typed)	1	2			
SURETY F	Name & Address			STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1	2			
	Name(s) & Title(s) (Typed)	1	2			
SURETY G	Name & Address			STATE OF INC.	LIABILITY LIMIT	Corporate Seal
	Signature(s)	1	2			
	Name(s) & Title(s) (Typed)	1	2			

BOND PREMIUM	▶	RATE PER THOUSAND \$	TOTAL \$
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### INSTRUCTIONS

1. This form is authorized for use in connection with contracts for construction work or the furnishing of supplies or services. There shall be no deviation from this form without approval by the Administrator of General Services.

2. The full legal name and business address of the Principal shall be inserted in the space designated "Principal" on the face of this form. The bond shall be signed by an authorized person. Where such person is signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of his authority must be furnished.

3. (a) Corporations executing the bond as sureties must be among those appearing on the Treasury Department's list of approved sureties and must be acting within the limitations set forth therein. Where more than a single corporate surety is involved, their names and addresses (city and State) shall be inserted in the spaces

(Surety A, Surety B, etc.) headed "CORPORATE SURETY(IES)", and in the space designated "SURETY(IES)" on the face of this form only the letter identification of the Sureties shall be inserted.

(b) Where individual sureties execute the bond, they shall be two or more responsible persons. A completed Affidavit of Individual Surety (Standard Form 28), for each individual surety, shall accompany the bond. Such sureties may be required to furnish additional substantiating information concerning their assets and financial capability as the Government may require.

4. Corporations executing the bond shall affix their corporate seals. Individuals shall execute the bond opposite the word "Seal"; and, if executed in Maine or New Hampshire, shall also affix an adhesive seal.

5. The name of each person signing this performance bond should be typed in the space provided.

**PAYMENT BOND**  
 (See Instructions on reverse)

25-203

DATE BOND EXECUTED (Must be same or later than date of contract)

PRINCIPAL (Legal name and business address)	TYPE OF ORGANIZATION ("X" one)  <input type="checkbox"/> INDIVIDUAL <input type="checkbox"/> PARTNERSHIP  <input type="checkbox"/> JOINT VENTURE <input type="checkbox"/> CORPORATION  STATE OF INCORPORATION												
SURETY(IES) (Name(s) and business address(es))	PENAL SUM OF BOND <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:25%;">MILLION(S)</td> <td style="width:25%;">THOUSAND(S)</td> <td style="width:25%;">HUNDRED(S)</td> <td style="width:25%;">CENT(S)</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;">CONTRACT DATE</td> <td style="width:50%;">CONTRACT NO</td> </tr> <tr> <td> </td> <td> </td> </tr> </table>	MILLION(S)	THOUSAND(S)	HUNDRED(S)	CENT(S)					CONTRACT DATE	CONTRACT NO		
MILLION(S)	THOUSAND(S)	HUNDRED(S)	CENT(S)										
CONTRACT DATE	CONTRACT NO												

KNOW ALL MEN BY THESE PRESENTS, That we, the Principal and Surety(ies) hereto, are firmly bound to the United States of America (hereinafter called the Government) in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally; *Provided*, That, where the Sureties are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal entered into the contract identified above:

NOW, THEREFORE, if the Principal shall promptly make payment to all persons supplying labor and material in the prosecution of the work provided for in said contract, and any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the Surety(ies) being hereby waived, then the above obligation shall be void and of no effect.

IN WITNESS WHEREOF, the Principal and Surety(ies) have executed this payment bond and have affixed their seals on the date set forth above.

PRINCIPAL			
	Signature(s)	1 _____	2 _____
		(Seal)	(Seal)
	Name(s) & Title(s) (Typed)	1 _____	2 _____
			Corporate Seal
INDIVIDUAL SURETY(IES)			
	Signature(s)	1 _____	2 _____
		(Seal)	(Seal)
	Name(s) (Typed)	1 _____	2 _____
CORPORATE SURETY(IES)			
SURETY A	Name & Address	STATE OF INC      LIABILITY LIMIT	
	Signature(s)	1 _____	2 _____
	Name(s) & Title(s) (Typed)	1 _____	2 _____
			Corporate Seal

CORPORATE SURETY(IES) (Continued)						
SURETY B	Name & Address		STATE OF INC	LIABILITY LIMIT	<i>Corporate Seal</i>	
	Signature(s)	1	2			
	Name(s) & Title(s) (Typed)	1	2			
SURETY C	Name & Address		STATE OF INC	LIABILITY LIMIT	<i>Corporate Seal</i>	
	Signature(s)	1	2			
	Name(s) & Title(s) (Typed)	1	2			
SURETY D	Name & Address		STATE OF INC	LIABILITY LIMIT	<i>Corporate Seal</i>	
	Signature(s)	1	2			
	Name(s) & Title(s) (Typed)	1	2			
SURETY E	Name & Address		STATE OF INC	LIABILITY LIMIT	<i>Corporate Seal</i>	
	Signature(s)	1	2			
	Name(s) & Title(s) (Typed)	1	2			
SURETY F	Name & Address		STATE OF INC	LIABILITY LIMIT	<i>Corporate Seal</i>	
	Signature(s)	1	2			
	Name(s) & Title(s) (Typed)	1	2			
SURETY G	Name & Address		STATE OF INC	LIABILITY LIMIT	<i>Corporate Seal</i>	
	Signature(s)	1	2			
	Name(s) & Title(s) (Typed)	1	2			

### INSTRUCTIONS

1. This form, for the protection of persons supplying labor and material, shall be used whenever a payment bond is required under the act of August 24, 1935, 49 Stat. 793, as amended (40 U.S.C. 270a-270e). There shall be no deviation from this form without approval by the Administrator of General Services.

2. The full legal name and business address of the Principal shall be inserted in the space designated "Principal" on the face of the form. The bond shall be signed by an authorized person. Where such person is signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of his authority must be furnished.

3. (a) Corporations executing the bond as sureties must be among those appearing on the Treasury Department's list of approved sureties and must be acting within the limitations set forth therein. Where more than a single corporate surety is involved, their names and addresses (city

and State) shall be inserted in the spaces (Surety A, Surety B, etc.) headed "CORPORATE SURETY (IES)", and in the space designated "SURETY (IES)" on the face of this form only the letter identification of the Sureties shall be inserted.

(b) Where individual sureties execute the bond, they shall be two or more responsible persons. A completed Affidavit of Individual Surety (Standard Form 28), for each individual surety, shall accompany the bond. Such sureties may be required to furnish additional substantiating information concerning their assets and financial capability as the Government may require.

4. Corporations executing the bond shall affix their corporate seals. Individuals shall execute the bond opposite the word "Seal"; and, if executed in Maine or New Hampshire, shall also affix an adhesive seal.

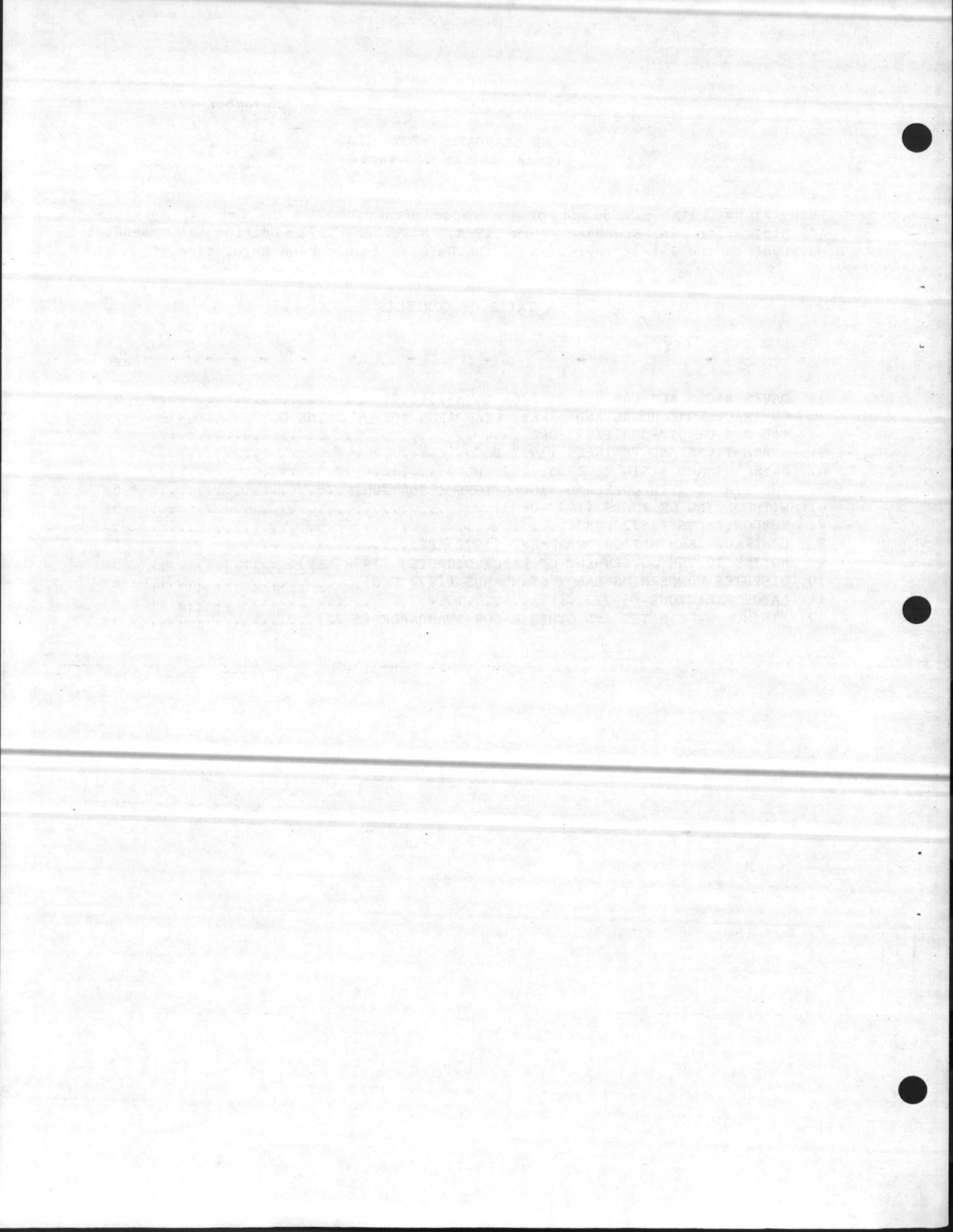
5. The name of each person signing this payment bond should be typed in the space provided.

LABOR STANDARDS PROVISIONS  
(Construction Contract)

(Provisions 1 through 8 and 10 are those prescribed by the General Services Administration in Standard Form 19-A, November 1972 Edition as amended pursuant to the latest revisions of the Defense Acquisition Regulation.)

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LABOR STANDARDS PROVISIONS  
(Construction Contract)

(Provisions 1 through 8 and 10 are those prescribed by the General Services Administration in Standard Form 19-A, November 1972 Edition as amended pursuant to the latest revisions of the Defense Acquisition Regulation.)

1. DAVIS-BACON ACT (40 U.S.C. 276a to a-7)(1977 DEC)

(a) All mechanics and laborers employed or working directly upon the site of the work shall 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 the Copeland Regulations (29 CFR, Part 3)), the full amounts due at time of payment computed at wage rates not less than the aggregate of the basic hourly rates and rates of payments, contributions, or costs for any fringe benefits contained in the wage determination decision 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 or subcontractor and such laborers and mechanics. A copy of such wage determination decision shall be kept posted by the Contractor at the site of the work in a prominent place where it can be easily seen by the workers. The term mechanics and laborers shall be deemed to include apprentices and trainees not covered by an approved program as provided by the apprentice and trainee clause of the contract.

(b) The Contractor may discharge his obligation under this clause to workers in any classification for which the wage determination decision contains:

(1) Only a basic hourly rate of pay, by making payment at not less than such basic hourly rate, except as otherwise provided in the Copeland Regulations (29 CFR, Part 3); or

(2) Both a basic hourly rate of pay and fringe benefits payments, by making payment in cash, by irrevocably making contributions pursuant to a fund, plan, or program for, and/or by assuming an enforceable commitment to bear the cost of, bona fide fringe benefits contemplated by the Davis-Bacon Act, or by any combination thereof. Contributions made, or costs assumed, on other than a weekly basis shall be considered as having been constructively made or assumed, during a weekly period to the extent that they apply to such period. Where a fringe benefit is expressed in a wage determination in any manner other than as an hourly rate and the Contractor pays a cash equivalent or provides an alternative fringe benefit, he shall furnish information with his payrolls showing how he determined that the cost incurred to make the cash payment or to provide the alternative fringe benefit is equal to the cost of the wage determination fringe benefit. In any case where the Contractor provides a fringe benefit different from any contained in the wage determination, he shall similarly show how he arrived at the hourly rate shown therefor. In the event of disagreement between or among the interested parties as to an equivalent of any fringe benefit, the

Contracting Officer shall submit the question, together with his recommendation, to the Secretary of Labor for final determination.

(c) The assumption of an enforceable commitment to bear the cost of fringe benefits, or the provision of any fringe benefits not expressly listed in section 1(b)(2) of the Davis-Bacon Act or in the wage determination decision forming a part of the contract, may be considered as payment of wages only with the approval of the Secretary of Labor pursuant to a written request by the Contractor. The Secretary of Labor may require the Contractor to set aside assets, in a separate account, to meet his obligations under any unfunded plan or program.

(d) The Contracting Officer shall require that any class of laborers or mechanics, including apprentices and trainees, which is not listed in the wage determination decision and which is to be employed under the contract shall be classified or reclassified conformably to the wage determination decision and shall report the action to the Secretary of Labor. If the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers or mechanics, including apprentices and trainees, to be used, the Contracting Officer shall submit the question, together with his recommendation, to the Secretary of Labor for final determination.

(e) In the event it is found by the Contracting Officer that any laborer or mechanic, including all apprentices and trainees, employed by the Contractor or any subcontractor directly on the site of the work covered by this contract has been or is being paid at a rate of wages less than the rate of wages required by

paragraph (a) of this clause, or by the "Apprentices and Trainees" clause of this contract, the Contracting Officer may (i) by written notice to the Government prime Contractor terminate his right to proceed with the work, or such part of the work as to which there has been a failure to pay said required wages, and (ii) prosecute the work to completion by contract or otherwise, whereupon such Contractor and his sureties shall be liable to the Government for any excess costs occasioned the Government thereby.

(f) Paragraphs (a) through (e) of the clause shall apply to this contract to the extent that it is (i) a prime contract with the Government subject to the Davis-Bacon Act or (ii) a subcontract also subject to the Davis-Bacon Act under such prime contract.

2. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT-OVERTIME COMPENSATION (40 U.S.C. 327-333)(1977 DEC)

This contract is subject to the Contract Work Hours and Safety Standards Act and to the applicable rules, regulations, and interpretations of the Secretary of Labor.

(a) The Contractor shall not require or permit any laborer or mechanic, including apprentices, trainees, watchmen, and guards in any workweek in which he is employed on any work under this contract to work in excess of eight (8) hours in any calendar day or in excess of forty (40) hours in such workweek on work subject to the provisions of the Contract Work Hours and Safety Standards Act unless such laborer or mechanic, including apprentices, trainees, watchmen, and guards, receives compensation at a rate not less than one and one-half times his basic rate of pay for all

such hours worked in excess of eight (8) hours in any calendar day or in excess of forty (40) hours in such work week, whichever is the greater number of overtime hours. The "basic rate of pay," as used in this clause, shall be the amount paid per hour, exclusive of the Contractor's contribution or cost for fringe benefits and any cash payment made in lieu of providing fringe benefits, or the basic hourly rate contained in the wage determination, whichever is greater.

(b) In the event of any violation of the provisions of paragraph (a), the Contractor shall be liable to any affected employee for any amounts due, and to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including an apprentice, trainee, watchman, or guard, employed in violation of the provisions of paragraph (a) in the sum of \$10 for each calendar day on which such employee was required or permitted to be employed on such work in excess of eight (8) hours or in excess of the standard workweek of forty (40) hours without payment of the overtime wages required by paragraph (a).

### 3. APPRENTICES AND TRAINEES (1977 DEC)

(a) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed 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 first ninety (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 in any craft classification employed on this contract shall not be greater than the ratio permitted to the Contractor as to his entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not a trainee as defined in paragraph (b) of this clause or is not registered or otherwise employed as stated above, shall be paid the wage rate determined by the Secretary of Labor for the classification of work he actually performed. The Contractor or subcontractor shall furnish to the Contracting Officer written evidence of the registration of his program and apprentices as well as the appropriate ratios and wage rates (expressed in percentages of the journeyman hourly rates), for the area of construction prior to using apprentices on the contract work. The wage rate paid apprentices shall be not less than the appropriate percentage of the journeyman's rate contained in the applicable wage determination.

(b) Trainees will be permitted to work at less than the predetermined rate for the work performed when 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, Bureau of Apprenticeship and Training. The ratio of trainees to journeymen on this contract shall not be greater than permitted under the plan approved by the Bureau of Apprenticeship and Training. Every trainee must be paid at not less than the rate specified in the approved program for his level of

progress. Any employee listed on the payroll at a trainee rate who is not registered and not participating in a training plan approved by the Bureau of Apprenticeship and Training shall be paid not less than the wage rate determined by the Secretary of Labor for the classification of work he actually performed. The Contractor or subcontractor shall furnish the Contracting Officer written evidence of the certification of his program, the registration of the trainee, and the ratios and wage rates prescribed in that program. In the event the Bureau of Apprenticeship and Training withdraws the approval of a training program, the Contractor shall 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) The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal opportunity requirements of this contract.

#### 4. PAYROLLS AND BASIC RECORDS (1977 DEC)

(a) The Contractor shall maintain payrolls and basic records relating thereto during the course of the work and shall preserve them for a period of three (3) years thereafter for all laborers and mechanics, including apprentices, trainees, watchmen, and guards, working at the site of the work. Such records shall contain the name and address of each such employee, his correct classification, rate of pay (including rates of contributions for, or costs assumed to provide, fringe benefits), daily and weekly number of hours worked, deductions made and actual wages paid. (NOTE: Watchmen and guards are reflected on payroll records for Contract Work Hours and Safety Standards

Act purposes only.) Whenever the Contractor has obtained approval from the Secretary of Labor as provided in paragraph (c) of the clause entitled "Davis-Bacon Act," he shall maintain records which show the commitment, its approval, written communication of the plan or program to the laborers or mechanics affected, and the costs anticipated or incurred under the plan or program.

(b) The Contractor shall submit weekly a copy of all payrolls to the Contracting Officer. The Government Prime Contractor shall be responsible for the submission of copies of payrolls of all subcontractors. The copy shall be accompanied by a statement signed by the Contractor indicating that the payrolls are correct and complete, that the wage rates contained therein are not less than those determined by the Secretary of Labor, and that the classifications set forth for each laborer or mechanic, including apprentices and trainees, conform with the work he performed. Weekly submission of the "Statement of Compliance" required under this contract and the Copeland Regulations of the Secretary of Labor (29 CFR, Part 3) shall satisfy the requirement for submission of the above statement. The Contractor shall submit also a copy of any approval by the Secretary of Labor with respect to fringe benefits which is required by paragraph (c) of the clause entitled "Davis-Bacon Act."

(c) The Contractor shall make the records required under this clause available for inspection by authorized representatives of the Contracting Officer and the Department of Labor, and shall permit such representatives to interview employees during working hours on the job.

5. COMPLIANCE WITH COPELAND REGULATIONS (1964 JUN)

The Contractor shall comply with the Copeland Regulations of the Secretary of Labor (29 CFR, Part 3) which are incorporated herein by reference. (DAR 7-602.23(a)(v))

6. WITHHOLDING OF FUNDS (1977 DEC)

(a) The Contracting Officer may withhold or cause to be withheld from the Government Prime Contractor so much of the accrued payments or advances as may be considered necessary (i) to pay laborers and mechanics, including apprentices, trainees, watchmen, and guards, employed by the Contractor or any subcontractor on the work the full amount of wages required by the contract, and (ii) to satisfy any liability of the Contractor and any subcontractor for liquidated damages under paragraph (b) of the clause entitled "Contract Work Hours and Safety Standards Act-Overtime Compensation."

(b) If the Contractor or any subcontractor fails to pay any laborer, mechanic, apprentice, trainee, watchman, or guard 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 Government Prime Contractor, take such action as may be necessary to cause suspension of any further payments or advances until such violations have ceased.

7. SUBCONTRACTS (1972 FEB)

The Contractor agrees to insert the clauses hereof entitled "Davis-Bacon Act," "Contract Work Hours and Safety Standards Act-Overtime Compensation," "Apprentices and Trainees," "Payrolls and Basic Records," "Compliance with Copeland Regulations," "With-

holding of Funds," "Subcontracts," and "Contract Termination-Debarment" in all subcontracts. The term "Contract" as used in such clauses in any subcontract shall be deemed to refer to the subcontractor except in the phrase "Government Prime Contractor." (DAR 7-602.23(a)(vii))

8. CONTRACT TERMINATION-DEBARMENT (1972 APR)

A breach of the clauses hereof entitled "Davis-Bacon Act," "Contract Work Hours and Safety Standards Act-Overtime Compensation," "Apprentices and Trainees," "Payrolls and Basic Records," "Compliance with Copeland Regulations," "Withholding of Funds," and "Subcontracts" may be grounds for termination of the contract, and for debarment as provided in 29 CFR 5.6 (DAR 7-602.23(a)(viii))

9. NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (1958 SEP)

(a) Whenever 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 thereof, including all relevant information with respect thereto, to the Contracting Officer.

(b) The Contractor agrees to insert the substance of this clause, including this paragraph (b), in any subcontract hereunder as to which a labor dispute may delay the timely performance of this contract; except that each such subcontract shall provide that in the event its timely performance is delayed or threatened by delay by actual or potential labor dispute, the subcontractor shall immediately notify his next higher tier subcontractor, or the prime contractor, as the case may be, of all relevant information with respect to such dispute (DAR 7-104.4)

10. DISPUTES CONCERNING LABOR STANDARDS  
(1977 DEC)

Disputes arising out of the labor standards provisions of this contract shall be subject to the Disputes clause except to the extent such disputes involve the meaning of classifications or wage rates contained in the wage determination decision of the Secretary of Labor or the applicability of the labor provisions of this contract which questions shall be referred to the Secretary of Labor in accordance with the procedures of the Department of Labor.

11. LABOR RELATIONS (6-72)

It is the Contractor's responsibility to maintain satisfactory labor relations with his employees. Representatives of the Contracting Officer will not participate in labor relations matters unless disputes develop that interfere with the proper performance of the contract, at which time the representative may endeavor to assist in settling the difficulty or may refer the matter to the Federal Mediation and Conciliation Service or the Commander, Naval Facilities Engineering Command for appropriate action.

12. MINIMUM WAGE RATES AND OTHER LABOR STANDARDS (6-72)

(a) The Contractor shall pay mechanics and laborers employed or working directly upon the site of the work wage rates not less than those determined as prevailing by the Secretary of Labor and contained in the wage determination decision that is attached to this specification or addendum thereto. In the event of any difference between the Contractor and the Government concerning the proper wage rates to be paid, the classification of employees to conform to prevailing practice, the amount of wages due employees, or any other

application or interpretation of the labor standards provisions in this contract, the differences shall be referred to the Contracting Officer who shall determine the matter with advice from the Secretary of Labor as required by Department of Labor regulations.

(b) Investigation of Labor Conditions. The wage determination decision of the Secretary of Labor attached hereto or included by amendment is made a part of this contract for the purpose of setting forth the minimum hourly wage rates required to be paid by the Davis-Bacon Act. The rates set forth in the wage determination are no warranty that labor will be available at these rates. Bidders are advised to make their own investigation to determine local labor conditions.

GENERAL PROVISIONS  
(Construction Contract)

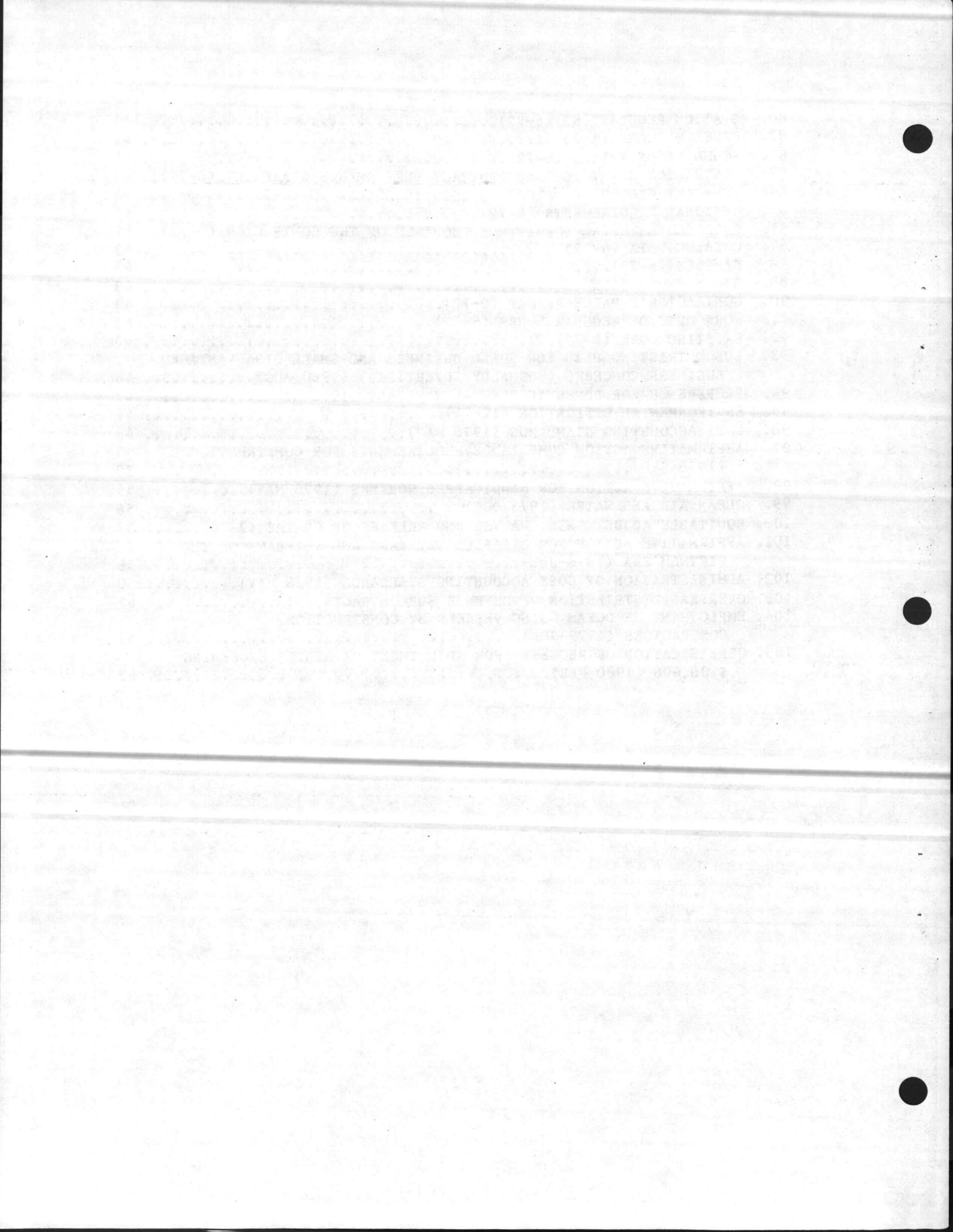
(Provisions 1 through 30 are those prescribed by the General Services Administration in Standard Form 23-A (Rev. 4-75), as amended pursuant to the latest revisions of the Defense Acquisition Regulation.)

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GENERAL PROVISIONS  
(Construction Contract)

(Provisions 1 through 30 are those prescribed by the General Services Administration in Standard Form 23-A (Rev. 4-75), as amended pursuant to the latest revisions of the Defense Acquisition Regulation.)

1. DEFINITIONS (1964 JUN)

(a) The term "head of the agency" or "Secretary" as used herein means the Secretary, the Under Secretary, any Assistant Secretary, or any other head or assistant head of the executive or military department or other Federal agency; and the term "his duly authorized representative" means any person or persons or board (other than the Contracting Officer) authorized to act for the head of the agency or the Secretary.

(b) The term "Contracting Officer" as used herein means the person executing this contract on behalf of the Government and includes a duly appointed successor or authorized representative. (DAR 7-602.1)

2. SPECIFICATIONS AND DRAWINGS  
(1964 JUN)

The Contractor shall keep on the work 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 either 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 his own risk and expense. The Contracting Officer shall furnish from time to time such detail drawings and other information as he may consider necessary, unless otherwise provided. (DAR 7-602.2)

3. CHANGES (1968 FEB)

(a) The Contracting Officer may, at any time, without notice to the sureties, by written order designated or indicated to be a change order, make any change in the work within the general scope of the contract, including but not limited to changes:

(i) In the specifications (including drawings and designs);

(ii) In the method or manner of performance of the work;

(iii) In the Government-furnished facilities, equipment, materials, services, or site; or

(iv) Directing acceleration in the performance of the work.

(b) Any other written order or an oral order (which terms as used in this paragraph (b) shall include direction, instruction, interpretation, or determination) from the Contracting officer, which causes any such change, shall be treated as a change order under this clause, provided that the Contractor

gives the Contracting Officer written notice stating the date, circumstances, and source of the order and that the Contractor regards the order as a change order.

(c) Except as herein provided, 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 hereunder.

(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 order, an equitable adjustment shall be made and the contract modified in writing accordingly. Provided, however, that except for claims based on defective specifications, no claims for any change under (b) above shall be allowed for any costs incurred more than 20 days before the Contractor gives written notice as therein required: And provided further, that 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 such defective specifications.

(e) If the Contractor intends to assert a claim for an equitable adjustment under this clause, he must, within 30 days after receipt of a written change order under (a) above or the furnishing of a written notice under (b) above, submit to the Contracting Officer a written statement setting forth the general nature and monetary extent of such claim, unless this period is extended by the Government. The statement of claim hereunder may be included in the notice under (b) above.

(f) No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under this contract. (DAR 7-602.3)

#### 4. DIFFERING SITE CONDITIONS (1968 FEB)

(a) The Contractor shall promptly, and before such conditions are disturbed, notify the Contracting Officer in writing of: (1) subsurface or latent physical conditions at the site differing materially from those indicated in this contract, or (2) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in this contract. The Contracting Officer shall promptly investigate the conditions, and if he finds that such conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performance of any part of the work under this contract, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the contract modified in writing accordingly.

(b) No claim of the Contractor under this clause shall be allowed unless the Contractor has given the notice required in (a) above, provided, however, the time prescribed therefor may be extended by the Government.

(c) No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under this contract. (DAR 7-602.4)

5. TERMINATION FOR DEFAULT-DAMAGES FOR DELAY-TIME EXTENSIONS (1969 AUG)

(a) If the Contractor refuses or fails to prosecute the work, or any separable part thereof, with such diligence as will insure its completion within the time specified in this contract, or any extension thereof, or fails to complete said work within such time, the Government may, by written notice to the Contractor, terminate his right to proceed with the work or such part of the work as to which there has been delay. In such event the Government may take over the work and prosecute the same to completion, by contract or otherwise, and may take possession of and utilize in completing the work such materials, appliances, and plant as may be on the site of the work and necessary therefor. Whether or not the Contractor's right to proceed with the work is terminated, he and his sureties shall be liable for any damage to the Government resulting from his refusal or failure to complete the work within the specified time.

(b) If fixed and agreed liquidated damages are provided in the contract and if the Government so terminates the Contractor's right to proceed, the resulting damage will consist of such liquidated damages until such reasonable time as may be required for final completion of the work together with any increased costs occasioned the Government in completing the work.

(c) If fixed and agreed liquidated damages are provided in the contract, and if the Government does not so terminate the Contractor's right to proceed, the resulting damage will consist of such liquidated damages until the work is completed or accepted.

(d) The Contractor's right to proceed shall not be so terminated nor

the Contractor charged with resulting damage if:

(1) The delay in the completion of the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, acts of the public enemy, acts of the Government in either its sovereign or contractual capacity, acts of another contractor in the performance of a contract with the Government, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather, or delays of subcontractors or suppliers arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and such subcontractors or suppliers; and

(2) The Contractor, within 10 days from the beginning of any such delay (unless the Contracting Officer grants a further period of time before the date of final payment under the contract), notifies the Contracting Officer in writing of the causes of delay.

The Contracting Officer shall ascertain the facts and extent of the delay and extend the time for completing the work when, in his judgment, the findings of fact justify such an extension, and his findings of fact shall be final and conclusive on the parties, subject only to appeal as provided in the "Disputes" clause of this contract.

(e) If, after notice of termination of the Contractor's right to proceed under the provisions of this clause, it is determined for any reason that the Contractor was not in default under the provisions of this clause, or that the delay was excusable under the provisions of this clause, the rights

and obligations of the parties shall if the contract contains a clause providing for termination for convenience of the Government, be the same as if the notice of termination had been issued pursuant to such clause. If, in the foregoing circumstances, this contract does not contain a clause providing for termination for convenience of the Government, the contract shall be equitably adjusted to compensate for such termination and the contract modified accordingly; failure to agree to any such adjustment shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes."

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

(g) As used in paragraph (d)(1) of this clause, the term "subcontractors or suppliers" means subcontractors or suppliers at any tier. (DAR 7602.5)

## 6. DISPUTES (1980 JUN)

(a) This contract is subject to the Contract Disputes Act of 1978 (P.L. 95-563).

(b) Except as provided in the Act, all disputes arising under or relating to this contract shall be resolved in accordance with this clause.

(c) (i) As used herein, "claim" means a written demand or assertion by one of the parties seeking, as a matter of right, the payment of money, adjustment or interpretation of contract terms, or other relief, arising under or relating to this contract. However, a written demand by the contractor seeking the payment of money in excess

of \$50,000 is not a claim until certified in accordance with (d) below.

(ii) A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim for the purpose of the Act. However, where such submission is subsequently disputed either as to liability or amount or not acted upon in a reasonable time, it may be converted to a claim pursuant to the Act by complying with the submission and certification requirements of this clause.

(iii) A claim by the Contractor shall be made in writing and submitted to the Contracting Officer for decision. A claim by the Government against the contractor shall be subject to a decision by the Contracting Officer.

(d) For contractor claims of more than \$50,000, the contractor shall submit with the claim a certification that the claim is made in good faith; the supporting data are accurate and complete to the best of the contractor's knowledge and belief; and the amount requested accurately reflects the contract adjustment for which the contractor believes the Government is liable. The certification shall be executed by the contractor if an individual. When the contractor is not an individual, the certification shall be executed by a senior company official in charge at the contractor's plant or location involved, or by an officer or general partner of the contractor having overall responsibility for the conduct of the contractor's affairs.

(e) For contractor claims of \$50,000 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 in excess of \$50,000 the Contracting Officer must decide the claim within 60 days or notify the contractor of the date when 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) Interest on the amount found due on a contractor claim shall be paid from the date the contracting officer receives the claim, or from the date payment otherwise would be due, if such date is later, until the date of payment.

(h) 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.

#### 7. PAYMENTS TO CONTRACTOR (1979 MAR)

(a) The Government will pay the contract price as hereinafter provided.

(b) The Government will make progress payments monthly as the work proceeds, or at more frequent intervals as determined by the Contracting Officer, on estimates approved by the Contracting Officer. If requested by the Contracting Officer, the Contractor shall furnish a breakdown of the total contract price showing the amount included therein for each principal category of the work, in such detail as requested, to provide a basis for determining progress payments. In the preparation of estimates the Contracting Officer, at his discretion, 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 may also be taken into consideration (1) if such consideration is specifically authorized by the contract and (2) if the Contractor furnishes satisfactory evidence that he has acquired title to such material and that it will be utilized on the work covered by this contract.

(c) In making such progress payments, there shall be retained 10 percent (10%) of the estimated amount until final completion and acceptance of the contract work. However, if the Contracting Officer finds that satisfactory progress was achieved during any period for which a progress payment is to be made, he may authorize such payment to be made in full without retention of a percentage. Also, whenever the work is substantially complete, the Contracting Officer shall retain an amount he considers adequate for the protection of the Government and, at his discretion, may release to the Contractor all or a portion of any excess amount. Furthermore, on completion and acceptance of each separate building, public work, or other division of the contract, on which the price is stated separately in the contract, payment may be made therefore without retention of a percentage.

(d) All material and work covered by progress payments made shall thereupon become the sole property of the Government, but this provision shall not be construed as 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 as waiving the right of the Government to require the fulfillment of all of the terms of the contract.

(e) The Contractor shall, upon request, be reimbursed for the entire amount of premiums paid for performance and payment bonds (including

coinsurance and reinsurance agreements, when applicable) after furnishing evidence of full payment to the surety.

(f) Upon completion and acceptance of all work, the amount due the Contractor under this contract shall be paid upon the presentation of a properly executed voucher and after the Contractor shall have furnished the Government with a release of all claims against the Government arising by virtue of this contract, other than claims in stated amounts as may be specifically excepted by the Contractor from the operation of the release. If the Contractor's claim to amounts payable under the contract has been assigned under the Assignment of Claims Act of 1940, as amended (31 U.S.C. 203, 41 U.S.C. 15), a release may also be required of the assignee.

#### 8. ASSIGNMENT OF CLAIMS (1976 OCT)

(a) Pursuant to the provisions of the Assignment of Claims Act of 1940, as amended (31 U.S.C. 203, 41 U.S.C. 15), if this contract provides for payments aggregating \$1,000 or more, claims for moneys due or to become due the Contractor from the Government under this contract may be assigned to a bank, trust company, or other financing institution, including any Federal lending agency, and may thereafter be further assigned and reassigned to any such institution. Any such assignment or reassignment shall cover all amounts payable under this contract and not already paid, and shall not be made to more than one party, except that any such assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in such financing. Unless otherwise provided in this contract, payments to an assignee of any moneys due or to become due under this contract shall not,

to the extent provided in said Act, as amended, be subject to reduction or setoff. (The preceding sentence applies only if this contract is made in time of war or national emergency as defined in said Act; and is with the Department of Defense, the General Services Administration, the Energy Research and Development Administration, the National Aeronautics and Space Administration, the Federal Aviation Administration, or any other department or agency of the United States designated by the President pursuant to Clause 4 of the proviso of Section 1 of the Assignment of Claims Act of 1940, as amended by the Act of May 15, 1951, 65 Stat. 41).

(b) In no event shall copies of this contract or of any plans, specifications, or other similar documents relating to work under this contract, if marked "Top Secret," "Secret," or "Confidential," be furnished to any assignee of any claim arising under this contract or to any other person not entitled to receive the same. However, a copy of any part or all of this contract so marked may be furnished, or any information contained therein may be disclosed, to such assignee upon the prior written authorization of the Contracting Officer. (DAR 7-602.8)

#### 9. MATERIAL AND WORKMANSHIP (1964 JUN)

(a) Unless otherwise specifically provided in this contract, all equipment, material, and articles incorporated in the work covered by this contract are to be new and of the most suitable grade for the purpose intended. Unless otherwise specifically provided in this contract, reference to any equipment, material, article, or patented process, by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition, and the Contractor may at his

option, use any equipment, material, article, or process which, in the judgment of the Contracting Officer, is equal to that named. The Contractor shall furnish to the Contracting Officer for his approval the name of the manufacturer, the model number, and other identifying data and information respecting the performance, capacity, nature, and rating of the machinery and mechanical and other equipment which the Contractor contemplates incorporating in the work. When required by this contract or when called for by the Contracting Officer, the Contractor shall furnish the Contracting Officer for approval full information concerning the material or articles which he contemplates incorporating in the work. When so directed, samples shall be submitted for approval at the Contractor's expense, with all shipping charges prepared. Machinery, equipment, material and articles installed or used without required approval shall be at the risk of subsequent rejection.

(b) All work under this contract shall be performed in a skillful and workmanlike manner. The Contracting Officer may, in writing, require the Contractor to remove from the work any employee the Contracting Officer deems incompetent, careless, or otherwise objectionable. (DAR 7-602.9)

#### 10. INSPECTION AND ACCEPTANCE (1976 OCT)

(a) All work (which term includes but is not restricted to materials, workmanship, and manufacture and fabrication of components) shall be subject to inspection and test by the Government at all reasonable times and at all places prior to acceptance. Any such inspection and test is for the sole benefit of the Government and shall not relieve the Contractor of the responsibility of providing quality

control measures to assure that the work strictly complies with the contract requirements. No inspection or test by the Government shall be construed as constituting or implying acceptance. Inspection or test shall not relieve the Contractor of responsibility for damage to or loss of the material prior to acceptance, nor in any way affect the continuing rights of the Government after acceptance of the completed work under the terms of paragraph (f) of this clause, except as hereinabove provided.

(b) The Contractor shall, without charge, replace any material or correct any workmanship found by the Government not to conform to the contract requirements, unless in the public interest the Government consents to accept such material or workmanship with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

(c) If the Contractor does not promptly replace rejected workmanship, the Government (1) may, by contract or otherwise, replace such material or correct such workmanship and charge the cost thereof to the Contractor, or (2) may terminate the Contractor's right to proceed in accordance with the clause of this contract entitled "Termination for Default - Damages for Delay - Time Extensions."

(d) The Contractor shall furnish promptly, without additional charge, all facilities, labor, and material reasonably needed for performing such safe and convenient inspection and test as may be required by the Contracting Officer. All inspection and test by the Government shall be performed in such manner as not unnecessarily to delay the work. Special, full size, and performance tests shall be performed as

described in this contract. The Government reserves the right to charge to the Contractor any additional cost of inspection or test when material or workmanship is not ready at the time specified by the Contractor for inspection or test or when reinspection or retest is necessitated by prior rejection.

(e) Should it be considered necessary or advisable by the Government at any time before acceptance of the entire work to make an examination of work already completed, by removing or tearing out same, the Contractor shall, on request, promptly furnish all necessary facilities, labor, and material. If such work is found to be defective or nonconforming in any material respect, due to the fault of the Contractor or his subcontractors, he shall defray all the expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, an equitable adjustment shall be made in the contract price to compensate the Contractor for the additional services involved in such examination and reconstruction and, if completion of the work has been delayed thereby, he shall, in addition, be granted a suitable extension of time.

(f) Unless otherwise provided in this contract, acceptance by the Government shall be made as promptly as practicable after completion and inspection of all work required by this contract, or that portion of the work that the Contracting Officer determines can be accepted separately. Acceptance shall be final and conclusive except as regards latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards the Government's rights under any warranty of guarantee. (DAR 7-602.11)

#### 11. SUPERINTENDENCE BY CONTRACTOR (1976 OCT)

The Contractor, at all times during performance and until the work is completed and accepted, shall give his personal superintendence to the work or have on the work a competent superintendent, satisfactory to the Contracting Officer and with authority to act for the Contractor. (DAR 7-602.12)

#### 12. PERMITS AND RESPONSIBILITIES (1964 JUN)

The Contractor shall, without additional expense to the Government, be responsible for obtaining any necessary licenses and permits, and for complying with any applicable Federal, State, and municipal laws, codes, and regulations, in connection with the prosecution of the work. He shall be similarly responsible for all damages to persons or property that occur as a result of his fault or negligence. He shall take proper safety and health precautions to protect the work, the workers, the public, and the property of others. He shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire construction work, except for any completed unit of construction thereof which theretofore may have been accepted. (DAR 7-602.13)

#### 13. CONDITIONS AFFECTING THE WORK (1964 JUN)

The Contractor shall be responsible for having taken steps reasonably necessary to ascertain the nature and location of the work, and the general and local conditions which can affect the work or the cost thereof. Any failure by the Contractor to do so will not relieve him from responsibility for successfully performing

the work without additional expense to the Government. The Government assumes no responsibility for any understanding or representations concerning conditions made by any of its officers or agents prior to the execution of this contract, unless such understanding or representations by the Government are expressly stated in the contract. (DAR 7-602.14)

#### 14. OTHER CONTRACTS (1964 JUN)

The Government may undertake or award other contracts for additional work, and the Contractor shall fully cooperate with such other contractors and Government employees and carefully fit his own work to such additional work as may be directed by the Contracting Officer. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other contractor or by Government employees. (DAR 7-602.15)

#### 15. SHOP DRAWINGS (1976 OCT)

(a) The term "shop drawings" 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.

(b) 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 his 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 his approval or disapproval

of the shop drawings and if not approved as submitted shall indicate his reasons therefor. Any work done prior to such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from any 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 (c) below.

(c) 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 variation(s), he shall issue an appropriate contract modification, except that, if the variation is minor and does not involve a change in price or time of performance, a modification need not be issued.

(d) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated herein) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated herein) of all shop drawings will be retained by the Contracting Officer and one set will be returned to the Contractor. (DAR 7-602.54(a))

#### 16. USE AND POSSESSION PRIOR TO COMPLETION (1976 OCT)

The Government shall have the right to take possession of or use any completed or partially completed part of the work. Prior to such possession or use, the Contracting Officer shall furnish the Contractor an itemized list of work remaining to be performed or corrected on such portions of the projects as are to be possessed or used by

the Government, provided that failure to list any item of work shall not relieve the Contractor of responsibility for compliance with the terms of the contract. Such possession or use shall not be deemed an acceptance of any work under the contract. While the Government has such possession or use, the Contractor, notwithstanding the provisions of the clause of this contract entitled "Permits and Responsibilities," shall be relieved of the responsibility for the loss or damage to the work resulting from the Government's possession or use. If such prior possession or use by the Government delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment in the contract price or the time of completion will be made and the contract shall be modified in writing accordingly. (DAR 7-602.39)

#### 17. SUSPENSION OF WORK (1968 FEB)

(a) The Contracting Officer may order the Contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as he may determine to be 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 by an act of the Contracting Officer in the administration of this contract, or by his failure to act within the time specified in this contract (or if no time is specified, within a reasonable time), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by such 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 (1) that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor or (2) for which an equitable adjustment is provided for or excluded under any other provision of this contract.

(c) No claim under this clause shall 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 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 such suspension, delay, or interruption, but not later than the date of final payment under the contract. (DAR 7-602.46)

#### 18. TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (1974 APR)

(a) The performance of work under this contract may be terminated by the Government in accordance with this clause in whole, or from time to time in part, whenever the Contracting Officer shall determine that such termination is in the best interest of the Government. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which performance of work under the contract is terminated, and the date upon which such termination becomes effective.

(b) After receipt of a Notice of Termination, and except as otherwise directed by the Contracting Officer, the Contractor shall:

(i) stop work under the contract on the date and to the extent specified in the Notice of Termination;

(ii) place no further orders or subcontracts for materials, services or facilities, except as may be necessary for completion of such portion of the work under the contract as is not terminated;

(iii) terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the Notice of Termination;

(iv) assign to the Government, in the manner, at the times, and to the extent directed by the Contracting Officer, all of the right, title, and interest of the Contractor under the orders and subcontracts so terminated, in which case the Government shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;

(v) settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts with the approval or ratification of the Contracting Officer, to the extent he may require, which approval or ratification shall be final for all the purposes of this clause;

(vi) transfer title and deliver to the Government, in the manner, at the times, and to the extent, if any, directed by the Contracting Officer, (A) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced as a part of, or acquired in connection with the performance of, the work terminated by the Notice of Termination, and (B) the completed or partially completed plans,

drawings, information, and other property which, if the contract had been completed, would have been required to be furnished to the Government.

(vii) use his best efforts to sell, in the manner, at the times, to the extent, and at the price or prices directed or authorized by the Contracting Officer, any property of the types referred to in (vi) above; provided, however, that the Contractor (A) shall not be required to extend credit to any purchaser, and (B) may acquire any such property under the conditions prescribed by and at a price or prices approved by the Contracting Officer, and provided, further that the proceeds of any such transfer of disposition shall be applied in reduction of any payments to be made by the Government to the Contractor under this contract or shall otherwise be credited to the price or cost of the work covered by this contract or paid in such other manner as the Contracting Officer may direct;

(viii) complete performance of such part of the work as shall not have been terminated by the Notice of Termination; and

(ix) take such actions as may be necessary, or as the Contracting Officer may direct, for the protection and preservation of the property related to this contract which is in the possession of the Contractor and in which the Government has or may acquire any interest.

At any time after expiration of the plant clearance period, as defined in Section VIII, Defense Acquisition Regulation, as it may be amended from time to time, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of any or all items of termination inventory

not previously disposed of, exclusive of items the disposition of which has been directed or authorized by the Contracting Officer, and may request the Government to remove such items or enter into a storage agreement covering them. Not later than fifteen (15) days thereafter, the Government will accept title to such items and remove them or enter into a storage agreement covering the same; provided, that the list submitted shall be subject to verification by the Contracting Officer upon removal of the items, or if the items are sorted, within forty-five (45) days from the date of submission of the list, and any necessary adjustments to correct the list as submitted shall be made prior to final settlement.

(c) After receipt of a Notice of Termination, the Contractor shall submit to the Contracting Officer his termination claim, in the form and with certification prescribed by the Contracting Officer. Such claim shall be submitted promptly but in no event later than one year from the effective date of termination, unless one or more extensions in writing are granted by the Contracting Officer, upon request of the Contractor made in writing within such one year period or authorized extension thereof. However, if the Contracting Officer determines that the facts justify such action, he may receive and act upon any such termination claim at any time after such one year period or any extension thereof. Upon failure of the Contractor to submit his termination claim within the time allowed, the Contracting Officer may determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall thereupon pay to the Contractor the amount so determined.

(d) Subject to the provisions of paragraph (c), the Contractor and the

Contracting Officer may agree upon the whole or any part of the amount or amounts to be paid to the Contractor by reason of the total or partial termination of work pursuant to this clause, which amount or amounts may include a reasonable allowance for profit or work done; provided, that such agreed amount or amounts, exclusive of settlement costs, shall not exceed the total contract price as reduced by the amount of payments otherwise made and as further reduced by the contract price of work not terminated. The contract shall be amended accordingly, and the Contractor shall be paid the agreed amount. Nothing in paragraph (e) of this clause, prescribing the amount to be paid to the Contractor in the event of failure of the Contractor and the Contracting Officer to agree upon the whole amount to be paid to the Contractor by reason of the termination of work pursuant to this clause, shall be deemed to limit, restrict, or otherwise determine or affect the amount or amounts which may be agreed upon to be paid to the Contractor pursuant to this paragraph (d).

(e) In the event of the failure of the Contractor and the Contracting Officer to agree, as provided in paragraph (d), upon the whole amount to be paid to the Contractor by reason of the termination of work pursuant to this clause, the Contracting Officer shall pay to the Contractor the amounts determined by the Contracting Officer as follows, but without duplication of any amounts agreed upon in accordance with paragraph (d):

(i) with respect to all contract work performed prior to the effective date of the Notice of Termination, the total (without duplication of any items) of--

(A) the cost of such work;

(B) the cost of settling and paying claims arising out of the termination of work under subcontracts or orders as provided in paragraph (b) (v) above, exclusive of the amounts paid or payable on account of supplies or materials delivered or services furnished by the subcontractor prior to the effective date of the Notice of Termination of Work under this contract, which amounts shall be included in the cost on account of which payment is made under (A) above; and

(C) a sum, as profit on (A) above, determined by the Contracting Officer pursuant to 8-303 of the Defense Acquisition Regulation, in effect as of the date of execution of this contract, to be fair and reasonable; provided, however, that if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, no profit shall be included or allowed under this subdivision (C) and an appropriate adjustment shall be made reducing the amount of the settlement to reflect the indicated rate of loss; and

(ii) the reasonable cost of the preservation and protection of property incurred pursuant to paragraph (b)(ix); and any other reasonable cost incidental to termination of work under this contract, including expense incidental to the determination of the amount due to the Contractor as the result of the termination of work under this contract.

The total sum to be paid to the Contractor under (i) above shall not exceed the total contract price as reduced by the amount of payments otherwise made and as further reduced by the contract price of work not terminated. Except for normal spoilage, and except to the extent that the Government shall have otherwise expressly assumed the

risk of loss, there shall be excluded from the amounts payable to the Contractor under (i) above, the fair value, as determined by the Contracting Officer of property which is destroyed, lost, stolen, or damaged so as to become undeliverable to the Government or to a buyer pursuant to paragraph (b) (vii).

(f) Costs claimed, agreed to, or determined pursuant to (c), (d), (e), and (i) hereof shall be in accordance with Section XV of the Defense Acquisition Regulation as in effect on the date of this contract.

(g) The Contractor shall have the right of appeal, under the clause of this contract entitled "Disputes," from any determination made by the Contracting Officer under paragraph (c), (e), or (i) hereof, except that if the Contractor has failed to submit his claim within the time provided in paragraph (c) or (i) hereof, and has failed to request extension of such time, he shall have no such right of appeal. In any case where the Contracting Officer had made a determination of the amount due under paragraph (c), (e) or (i) hereof, the Government shall pay to the Contractor the following: (i) if there is no right of appeal hereunder or if no timely appeal has been taken, the amount so determined by the Contracting Officer, or (ii) if an appeal has been taken, the amount finally determined on such appeal.

(h) In arriving at the amount due the Contractor under this clause there shall be deducted (i) all unliquidated advance or other payments on account theretofore made to the Contractor, applicable to the terminated portion of this contract, (ii) any claim which the Government may have against the Contractor in connection with this contract, and (iii) the agreed price for,

or the proceeds of sale of, any materials, supplies, or other things acquired by the Contractor or sold, pursuant to the provisions of this clause, and not otherwise recovered by or credited to the Government.

(i) If the termination hereunder be partial, the Contractor may file with the Contracting Officer a claim for an equitable adjustment of the price or prices specified in the contract relating to the continued portion of the contract (the portion not terminated by the Notice of Termination), and such equitable adjustment as may be agreed upon shall be made in such price or prices. Any claim by the Contractor for an equitable adjustment under this clause must be asserted within ninety (90) days from the effective date of the termination notice, unless an extension is granted in writing by the Contracting Officer.

(j) The Government may from time to time, under such terms and conditions as it may prescribe, make partial payments and payments on account against costs incurred by the Contractor in connection with the terminated portion of this contract whenever in the opinion of the Contracting Officer the aggregate of such payments shall be within the amount to which the Contractor will be entitled hereunder. If the total of such payments is in excess of the amount finally agreed or determined to be due under this clause, such excess shall be payable by the Contractor to the Government upon demand, together with interest computed at the rate established by the Secretary of the Treasury pursuant to the Public Law 92-41, 85 STAT 97 for the Renegotiation Board, for the period from the date such excess payment is received by the Contractor to the date on which excess payment is received by

the Contractor to the date on which excess is repaid to the Government; provided, however, that no interest shall be charged with respect to any such excess payment attributable to a reduction in the Contractor's claim by reason of retention or other disposition of termination inventory until ten days after the date of such retention or disposition, or such later date as determined by the Contracting Officer by reason of the circumstances.

(k) Unless otherwise provided for in this contract, or by applicable statute, the Contractor shall--from the effective date of termination until the expiration of three years after final settlement under this contract--preserve and make available to the Government at all reasonable times at the office of the Contractor but without direct charge to the Government, all his books, records, documents and other evidence bearing on the costs and expenses of the Contractor under this contract and relating to the work terminated hereunder, or, to the extent approved by the Contracting Officer, photographs, microphotographs, or other authentic reproductions thereof. (DAR 7-602.29(a))

#### 19. INTEREST (1972 MAY)

Notwithstanding any other provision of this contract, unless paid within 30 days 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) shall bear interest from the date due until paid and shall be subject to adjustments as provided by Part 6 of Appendix E of the Defense Acquisition Regulation, as in effect on the date of this contract. The interest rate per annum shall be the interest rate in effect which has been established by the Secretary of the

Treasury pursuant to Public Law 92-41; 85 STAT 97 for the Renegotiation Board, as of the date the amount becomes due as herein provided. Amounts shall be due upon the earliest one of (i) the date fixed pursuant to this contract; (ii) the date of the first written demand for payment, consistent with this contract, including demand consequent upon default termination; (iii) the date of transmittal by the Government to the Contractor of a proposed supplemental agreement to confirm completed negotiations fixing the amount; or (iv) 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 in connection with a negotiated pricing agreement not confirmed by contract supplement.

#### 20. PRICING OF ADJUSTMENTS (1970 JUL)

When costs are a factor in any determination of a contract price adjustment pursuant to the "Changes" clause or any other provision of this contract, such costs shall be in accordance with Section XV of the Defense Acquisition Regulation as in effect on the date of this contract. (DAR 7-103.26)

#### 21. PATENT INDEMNITY (1964 JUN)

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 Letters Patent of the United States (except Letters Patent issued upon an application which is now or may hereafter be, for reasons of national security, ordered by the Government to be kept secret or otherwise withheld from issue) arising out of the performance of this contract or out of

the use or disposal by or for the account of the Government of supplies furnished or construction work performed hereunder. (DAR 7-602.16)

#### 22. ADDITIONAL BOND SECURITY (1976 OCT)

If any surety upon any bond furnished in connection with this contract becomes unacceptable to the Government, or if any such surety fails to furnish reports as to his financial condition from time to time as requested by the Government, or if the contract price is increased to such an extent that the penal sum of any bond becomes inadequate in the opinion of the Contracting Officer, the Contractor shall promptly furnish such additional security as may be required from time to time to protect the interests of the Government and of persons supplying labor or materials in the prosecution of the work contemplated by this contract. (DAR 7-602.17)

#### 23. EXAMINATION OF RECORDS BY COMPTROLLER GENERAL (1975 JUN)

(a) This clause is applicable if the amount of this contract exceeds \$10,000 and was entered into by means of negotiation, including small business restricted advertising, but is not applicable if this contract was entered into by means of formal advertising.

(b) The Contractor agrees that the Comptroller General of the United States or any of his duly authorized representatives shall, until the expiration of three years after final payment under this contract or such lesser time specified in either Appendix M of the Defense Acquisition Regulation or the Federal Procurement Regulations Part 1-20, as appropriate, have access to and the right to examine any directly pertinent books, documents,

papers, and records of the Contractor involving transactions related to this contract.

(c) The Contractor further agrees to include in all his subcontracts hereunder a provision to the effect that the subcontractor agrees that the Comptroller General of the United States or any of his duly authorized representatives shall, until the expiration of three years after final payment under the subcontract or such lesser time specified in either Appendix M of the Defense Acquisition Regulations Part 1-20, as appropriate, have access to and the right to examine any directly pertinent books, documents, papers, and records of such subcontractor, involving transactions related to the subcontract. The term "subcontract" as used in this clause excludes (i) purchase orders not exceeding \$10,000 and (ii) subcontracts or purchase orders for public utility services at rates established for uniform applicability to the general public.

(d) The periods of access and examination described in (b) and (c) above for records which relate to (i) appeals under the "Disputes" clause of this contract, (ii) litigation or the settlement of claims arising out of the performance of this contract, or (iii) costs and expenses of this contract as to which exception has been taken by the Comptroller General or any of his duly authorized representatives, shall continue until such appeals, litigation, claims or exceptions have been disposed of. (DAR 7-104.15)

#### 24. BUY AMERICAN (1966 OCT)

(a) Agreement. In accordance with the Buy American Act (41 U.S.C. 10a-10d), the Contractor agrees that only domestic construction material

will be used (by the Contractor, subcontractors, materialmen, and suppliers) in the performance of this contract, except for nondomestic construction material listed in the "Nondomestic Construction Materials" clause, if any, of this contract.

(b) Domestic construction material. "Construction material" means any article, material, or supply brought to the construction site for incorporation in the building or work. An unmanufactured construction material is a "domestic construction material" if it has been mined or produced in the United States. A manufactured construction material is a "domestic construction material" if it has been manufactured in the United States and if the cost of its components which have been mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. "Component" means any article, material, or supply directly incorporated in a construction material.

(c) Domestic component. A component shall be considered to have been "mined, produced, or manufactured in the United States" (regardless of its source in fact) if the article, material, or supply in which it is incorporated was manufactured in the United States and the component is of a class or kind determined by the Government to be not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality. (DAR 7-602.20)

#### 25. EQUAL OPPORTUNITY (1978 SEP)

(If, during any twelve (12) month period (including the twelve months preceding the award of this contract), the Contractor has been or is awarded federal contracts and/or subcontracts

which have an aggregate value in excess of \$10,000 the Contractor shall comply with (a) through (g) below. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.)

During the performance of this contract, the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will 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. Such action shall include, but not be limited to, the following: Employment upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this Equal Opportunity clause.

(b) The Contractor will, in all solicitation 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.

(c) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding a notice to be provided by the agency Contracting Officer, advising the labor union or workers' representative of the Contractor's

commitments under this Equal Opportunity clause and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) The Contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended by Executive Order No. 11375 of October 13, 1967, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(e) The Contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, as amended by Executive order No. 11375 of October 13, 1967, and by the rules, regulations, and orders of the Secretary of Labor or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(f) In the event of the Contractor's noncompliance with the Equal Opportunity clause of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended, in whole or in part, and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, as amended by Executive Order No. 11375 of October 13, 1967, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, as amended by Executive Order No. 11375 of October 13, 1967, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(g) The Contractor will include the provisions of Paragraphs (a)

through (g) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, as amended by Executive Order No. 11375 of October 13, 1967, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the Contractor may request the United States to enter into such litigation to protect the interest of the United States. (DAR 7-103.18)

26. CONVENANT AGAINST CONTINGENT FEES  
(1958 JAN)

The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement of understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. 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 such commission, percentage, brokerage, or contingent fee. (DAR 7-103.20)

27. OFFICIALS NOT TO BENEFIT  
(1964 JUN)

No member of Congress or resident Commissioner shall be admitted to any share or part of this contract, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit. (DAR 7-602.19)

28. CONVICT LABOR (1975 OCT)

In connection with the performance of work under this contract, the Contractor agrees not to employ any person undergoing sentence of imprisonment except as provided by Public Law 89-176, September 10, 1965 (18 U.S.C. 4082 (c)(2)) and Executive Order 11755, December 29, 1973. (DAR 7-104.17)

29. UTILIZATION OF SMALL BUSINESS AND  
SMALL DISADVANTAGED BUSINESS  
CONCERNS (1980 AUG)

(a) It is the policy of the United States that small business and small business concerns owned and controlled by socially and economically disadvantaged individuals shall have the maximum practicable opportunity to participate in the performance of contracts let by any Federal agency.

(b) The Contractor hereby agrees to carry out this policy in the awarding of subcontracts to the fullest extent consistent with the efficient performance of this contract. The term "subcontract" means any agreement (other than one involving an employer-employee relationship) to be entered into by a Federal Government prime contractor or subcontractor calling for supplies or services required for the performance of the original contract or subcontract. The Contractor further agrees to cooperate in any

studies or surveys as may be conducted by the United States Small Business Administration or the awarding agency of the United States as may be necessary to determine the extent of the Contractor's compliance with this clause.

(c) As used in this contract, the term "small business concern" shall mean a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto. The term "small business concern owned and controlled by socially and economically disadvantaged individuals," hereafter referred to as disadvantaged business, shall mean a small business concern -

(1) which is at least 51 per centum owned by one or more socially and economically disadvantaged individuals; or, in the case of any publicly owned business, at least 51 per centum of the stock of which is owned by one or more socially and economically disadvantaged individuals; and

(2) whose management and daily business operations are controlled by one or more of such individuals. The Contractor shall presume that socially and economically disadvantaged individuals include Black Americans, Hispanic Americans, Native Americans (i.e., American Indians, Eskimos, Aleuts and Native Hawaiians), Asian-Pacific Americans (i.e., U.S. citizens whose origins are from Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U.S. Trust Territories of the Pacific, Northern Marianas, Laos, Cambodia, and Taiwan, and other minorities, or any individuals found to be disadvantaged by the Administration pursuant to Section 8(a) of the Small Business Act.

(d) Contractors acting in good faith may rely on written representations by their subcontractors regarding their status as either a small business concern or a small business concern owned and controlled by socially and economically disadvantaged individuals. (DAR 7-104.14)

### 30. FEDERAL, STATE, AND LOCAL TAXES (1971 NOV)

(a) Except as may be otherwise provided in this contract, the contract price includes all applicable Federal, State, and local taxes and duties.

(b) Nevertheless, with respect to any Federal excise tax or duty on the transactions or property covered by this contract, if a statute, court decision, written ruling, or regulation takes effect after the contract date and--

(1) results in the Contractor being required to pay or bear the burden of any such Federal excise tax or duty or increase in the rate thereof which would not otherwise have been payable on such transactions or property, the contract price shall be increased by the amount of such tax or duty or rate increase, 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; or

(2) results in the Contractor not being required to pay or bear the burden of, or in his obtaining a refund or drawback of, any such Federal excise tax or duty which would otherwise have been payable on such transactions or property or which was the basis of an increase in the contract price, the contract price shall be decreased by the amount of the relief, refund, or

drawback, or that amount shall be paid to the Government, as directed by the Contracting Officer. The contract price shall be similarly decreased if the Contractor, through his fault or negligence or his failure to follow instructions of the Contracting Officer, is required to pay or bear the burden of, or does not obtain a refund or drawback of, any such Federal excise tax or duty.

(c) Paragraph (b) above shall not be applicable to social security taxes or to any other employment tax.

(d) No adjustment of less than \$100 shall be made in the contract price pursuant to paragraph (b) above.

(e) As used in paragraph (b) above, the term "contract date" means the date set for bid opening, or if this is a negotiated contract, the contract date. As to additional supplies or services procured by modification to this contract, the term "contract date" means the date of such modification.

(f) Unless there does not exist any reasonable basis to sustain an exemption, the Government upon the request of the Contractor shall, without further liability, furnish evidence appropriate to establish exemption from any Federal, State, or local tax; provided, that evidence appropriate to establish exemption from any Federal excise tax or duty which may give rise to either an increase or decrease in the contract price will be furnished only at the discretion of the Government.

(g) The Contractor shall promptly notify the Contracting Officer of matters which will result in either an increase or decrease in the contract price, and shall take action with

respect thereto as directed by the Contracting Officer. (DAR 7-103.10(a))

### 31. CONTRACTOR INSPECTION SYSTEM (1964 NOV)

The Contractor shall (i) maintain an adequate inspection system and perform such inspections as will assure that the work performed under the contract conforms to contract requirements, and (ii) maintain and make available to the Government adequate records of such inspection. (DAR 7-602.10)

### 32. GRATUITIES (1952 MAR)

(a) The Government may, by written notice to the Contractor, terminate the right of the Contractor to proceed under this contract if it is found, after notice and hearing by the Secretary or his duly authorized representative, that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the Contractor, or any agent or representative of the Contractor, to any officer or employee of the Government with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing, of such contract; provided, that the existence of the facts upon which the Secretary or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court.

(b) In the event this contract is terminated as provided in paragraph (a) hereof, the Government shall be entitled (i) to pursue the same remedies against the Contractor as it could pursue in the event of a breach of the contract by the Contractor, and (ii) as a penalty in addition to any other damages to which it may be entitled by

law, to exemplary damages in an amount (as determined by the Secretary or his duly authorized representative) which shall be not less than three nor more than ten times the cost incurred by the Contractor in providing any such gratuities to any such officer or employee.

(c) 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. (DAR 7-602.25)

33. NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (1965 JAN)

The provisions of this clause shall be applicable only if the amount of this contract exceeds \$10,000.

(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 hereunder, the Contractor shall furnish to the Government, when requested by the Contracting Officer, all evidence and information in possession of the Contractor pertaining to such suit or claim. Such evidence and information shall be furnished at the expense of the Government except where the Contractor has agreed to indemnify the Government.

(c) This clause shall be included in all subcontracts. (DAR 7-103.23)

34. AUTHORIZATION AND CONSENT (1964 MAR)

The Government hereby gives its authorization and consent (without prejudice to its rights of indemnification, if such rights are provided for in the contract) for all use and manufacture, in the performance of this contract or any part thereof or any amendment hereto or any subcontract hereunder (including any lower-tier subcontract), of any patented invention (i) embodied in the structure or composition of any article the delivery of which is accepted by the Government under this contract, or (ii) utilized in the machinery, tools, or methods the use of which necessarily results from compliance by the Contractor or the using subcontractor with (a) specifications or written provisions now or hereafter forming a part of this contract, or (b) specific written instructions given by the OICC directing the manner of performance. The Contractor's entire liability to the Government for patent infringement shall be determined solely by the provisions of the indemnity clause, if any, included in the contract and the Government assumes liability for all other infringement to the extent of the authorization and consent hereinabove granted. (DAR 7-103.22)

35. COMPOSITION OF CONTRACTOR (1965 JAN)

If the Contractor hereunder is comprised of more than one legal entity, each such entity shall be jointly and severally liable hereunder. (DAR 7-602.32)

36. SITE INVESTIGATION (1965 JAN)

The Contractor acknowledges that he has investigated and satisfied himself as to the conditions affecting the

work, including but not restricted to those bearing upon transportation disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, river states, tides or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the work. The Contractor further acknowledges that he has satisfied himself 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 information presented by the drawings and specifications made a part of this contract. Any failure by the Contractor to acquaint himself with the available information will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work. The Government assumes no responsibility for any conclusions or interpretations made by the Contractor on the basis of the information made available by the Government. (DAR 7-602.33)

37. PROTECTION OF EXISTING VEGETATION, STRUCTURES, UTILITIES, AND IMPROVEMENT (1965 JAN)

(a) The Contractor will preserve and protect all existing vegetation such as trees, shrubs, and grass on or adjacent to the site of work which is not to be removed and which does not unreasonably interfere with the construction work. Care will be taken in removing trees authorized for removal to avoid damage to vegetation to remain in place. Any limbs or branches of trees broken during such operations or by the careless operation of equipment,

or by workmen, shall be trimmed with a clean cut and painted with an approved tree pruning compound as directed by the Contracting Officer.

(b) The Contractor will protect from damage all existing improvements or utilities at or near the site of the work, the location of which is made known to him, and will repair or restore any damage to such facilities, resulting from failure to comply with the requirements of this contract or the failure to exercise reasonable care in the performance of the work. If the Contractor fails or refuses to repair any such damage promptly, the Contracting Officer may have the necessary work performed and charge the cost thereof to the Contractor. (DAR 7-602.34)

38. OPERATIONS AND STORAGE AREAS (1965 JAN)

(a) All operations of the Contractor (including storage of materials) upon Government premises shall be confined 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 his operations.

(b) Temporary buildings (storage sheds, shops, offices, etc.) 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. Such temporary buildings and utilities shall remain the property of the Contractor and shall be removed by him at his expense upon the completion of the work. With the written consent of the Contracting Officer, such 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 construct and use such temporary roadways as may be authorized by the Contracting Officer. Where materials are transported in the prosecution of 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, protection against damage shall be provided by the Contractor and any damaged roads, curbs, or sidewalks shall be repaired by or at the expense of the Contractor. (DAR 7-602.35)

#### 39. MODIFICATION PROPOSALS -- PRICE BREAKDOWN (1968 APR)

The Contractor, in connection with any proposal he makes for a contract modification, shall furnish a price breakdown, itemized as required by the Contracting Officer. Unless otherwise directed, the breakdown shall be in sufficient details to permit an analysis of all material, labor, equipment, subcontract, and overhead costs, as well as profit, and shall cover all work involved in the modification, whether such work was deleted, added or changed. Any amount claimed for subcontracts shall be supported by a similar price breakdown. In addition, if the proposal includes a time extension, a justification thereof shall also be furnished. The proposal, together with the price breakdown and time extension justification, shall be furnished by the date specified by the Contracting Officer. (DAR 7-602.36)

#### 40. SUBCONTRACTORS (1979 MAR)

Within seven days after the award of any subcontract either by himself or

a subcontractor, the Contractor shall deliver to the Contracting Officer a completed DD Form 1566. The form shall include the subcontractor's acknowledgement of the inclusion in his subcontract of the clauses of this contract entitled "Davis-Bacon Act," "Contract Work Hours and Safety Standards Act - Overtime Compensation," "Apprentices and Trainees," "Compliance with Copeland Regulations," "Withholding of Funds," "Subcontracts," "Contract Termination - Debarment," and "Payrolls and Basic Records." Nothing contained in this contract shall create any contractual relation between the subcontractor and the Government.

#### 41. CLEANING UP (1965 JAN)

The Contractor shall at all times keep the construction area, including storage areas used by him, free from accumulations of waste material or rubbish and prior to completion of the work remove any rubbish from the premises and all tools, scaffolding, 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 workmanlike condition satisfactory to the Contracting Officer. (DAR 7-602.40)

#### 42. ADDITIONAL DEFINITIONS (1965 JAN)

(a) 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.

(b) 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 "provided complete in place," that is "furnished and installed." (DAR 7-602.41)

#### 43. ACCIDENT PREVENTION (1977 JUN)

(a) In order to provide safety controls for protection to the life and health of employees and other persons; for prevention of damage to property, materials, supplies, and equipment; and for avoidance of work interruptions in the performance of this contract, the Contractor shall comply with all pertinent provisions of Corps of Engineers Manual, EM 385-1-1, dated 1 June 1977 entitled "General Safety Requirements," as amended, and will also take or cause to be taken such additional measures as the Contracting Officer may determine to be reasonably necessary for the purpose.

(b) The Contractor will maintain an accurate record of, and will report to the Contracting Officer in the manner and on the forms prescribed by the Contracting Officer, exposure data and all accidents resulting in death, traumatic injury, occupational disease, and damage to property, materials, supplies and equipment incident to work performed under this contract.

(c) The Contracting Officer will notify the Contractor 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 his 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 work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

(d) Compliance with the provisions of this article by subcontractors will be the responsibility of the Contractor.

If the contract involves more than 6 months work or is described as hazardous character in the Invitation for Bids, Schedule, or Specifications, the following paragraph (e) will apply.

(e) Prior to commencement of the work the Contractor will:

(1) submit in writing his proposals for effectuating this provision for accident prevention;

(2) meet in conference with representatives of the Contracting Officer to discuss and develop mutual understandings relative to administration of the overall safety program. (DAR 7-602.42)

#### 44. GOVERNMENT INSPECTORS (1965 JAN)

The work will be conducted under the general direction of the Contracting Officer and is subject to inspection by his appointed inspectors to insure strict compliance with the terms of the contract. No inspector is authorized to change any provision of the specifications without written

authorization of the Contracting Officer, nor shall the presence or absence of an inspector relieve the Contractor from any requirements of the contract. (DAR 7-602.43)

45. RIGHTS IN SHOP DRAWINGS (1966 APR)

(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. (DAR 7-602.47)

46. PRIORITIES, ALLOCATIONS, AND ALLOTMENTS (1975 OCT)

(The following clause is applicable to rateable contracts.)

The Contractor shall follow the provisions of DMS Reg. 1 or DPS Reg. 1 and all other applicable regulations and orders of the Bureau of Domestic Commerce in obtaining controlled materials and other products and materials needed to fill this order. (DAR 7-104.18)

47. PRICE REDUCTION FOR DEFECTIVE COST OF PRICING DATA--PRICE ADJUSTMENTS (1970 JAN)

(a) This clause shall become operative only with respect to any modification of this contract which involves aggregate increases and/or decreases in costs plus applicable profits in excess of \$500,000 unless the

modification is priced on the basis of adequate competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation. The right to price reduction under this clause is limited to defects in data relating to such modification.

(b) If any price, including profit or fee, negotiated in connection with any price adjustment under this contract was increased by any significant sums because:

(i) the Contractor furnished cost or pricing data which was not complete, accurate and current as certified in the Contractor's Certificate of Current Cost or Pricing Data:

(ii) a subcontractor, pursuant to the clause of this contract entitled "Subcontractor Cost or Pricing Data" or "Subcontractor Cost or Pricing Data -- Price Adjustment" or any subcontract clause therein required, furnished cost or pricing data which was not complete, accurate and current as certified in the subcontractor's Certificate of Current Cost or Pricing Data;

(iii) a subcontractor or prospective subcontractor furnished cost or pricing data which was required to be complete, accurate and current and to be submitted to support a subcontract cost estimate furnished by the Contractor but which was not complete, accurate and current as of the date certified in the Contractor's Certificate of Current Cost or Pricing Data; or

(iv) the Contractor or a subcontractor or prospective subcontractor furnished any data, not within (i), (ii) or (iii) above, which was not accurate, as submitted; the price shall be reduced accordingly and the contract shall be modified in writing as may be

necessary to reflect such reduction. However, any reduction in the contract price due to defective subcontract data of a prospective subcontractor, when the subcontract was not subsequently awarded to such subcontractor, will be limited to the amount (plus applicable overhead and profit markup) by which the actual subcontract, or actual cost to the Contractor if there was no subcontract, was less than the prospective subcontract cost estimate submitted by the Contractor, provided the actual subcontract price was not affected by defective cost or pricing data.

Note: Since the contract is subject to reduction under this clause by reason of defective cost or pricing data submitted in connection with certain subcontracts, it is expected that the Contractor may wish to include a clause in each such subcontract requiring the subcontractor to appropriately indemnify the Contractor. However, the inclusion of such a clause and the terms thereof are matters for negotiation and agreement between the Contractor and the subcontractor, provided that they are consistent with DAR 23- 203 relating to Disputes provisions in subcontracts. It is also expected that any sub- contractor subject to such indemnification will generally require substantially similar indemnification for defective cost or pricing data required to be submitted by his lower tier subcontractors. (DAR 7-104.29(b))

48. AUDIT BY DEPARTMENT OF DEFENSE  
(1978 AUG)

(The following clause is applicable unless this contract was entered into by formal advertising and is not in excess of \$100,000)

(a) General. The Contracting Officer or his representatives shall

have the audit and inspection rights described in the applicable paragraphs (b), (c) and (d) below.

(b) Examination of Costs. If this is a cost reimbursement type, incentive, time and materials, labor hour, or price redeterminable contract, or any combination thereof, the Contractor shall maintain, and the Contracting Officer or his representatives shall have the right to examine books, records, documents, and other evidence and accounting procedures and practices, sufficient to reflect properly all direct and indirect costs of whatever nature claimed to have been incurred and anticipated to be incurred for the performance of this contract. Such right of examination shall include inspection at all reasonable times of the Contractor's plants, or such parts thereof, as may be engaged in the performance of this contract.

(c) Cost or Pricing Data. If the Contractor submitted cost or pricing data in connection with the pricing of this contract or any change or modification thereto, unless such pricing was based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation, the Contracting Officer or his representatives who are employees of the United States Government shall have the right to examine all books, records, documents and other data of the Contractor related to the negotiation, pricing or performance of such contract, change or modification, for the purpose of evaluating the accuracy, completeness and currency of the cost or pricing data submitted. Additionally, in the case of pricing any change or modification exceeding \$100,000 to formally advertised contracts, the Comptroller General of the United States or his

representatives who are employees of the United States Government shall have such rights. The right of examination shall extend to all documents necessary to permit adequate evaluation of the cost or pricing data submitted, along with the computations and projections used therein.

(d) Reports. If the Contractor is required to furnish Contractor Cost Data Reports (CCDR), Contract Fund Status Reports (CFSR), or Cost Performance Reports (CPR), the Contracting Officer or his representatives shall have the right to examine books, records, other documents, and supporting materials, for the purpose of evaluation (i) the effectiveness of the Contractor's policies and procedures to produce data compatible with the objectives of these reports, and (ii) the data reported.

(e) Availability. The materials described in (b), (c) and (d) above shall be made available at the office of the Contractor, at all reasonable times, for inspection, audit, or reproduction, until the expiration of three years from the date of final payment under this contract or such lesser time specified in Appendix M of the Defense Acquisition Regulation, and for such longer period, if any, as is required by applicable statute, or by other clauses of this contract, or by (1) and (2) below:

(1) If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for a period of three years from the date of any resulting final settlement.

(2) Records which relate to appeals under the "Disputes" clause of this contract, or litigation or the settlement of claims arising out of the

performance of this contract, shall be made available until such appeals, litigation, or claims have been disposed of.

(f) The Contractor shall insert a clause containing all the provisions of this clause, including this paragraph (f), in all subcontracts exceeding \$10,000 hereunder, except altered as necessary for proper identification of the contracting parties and the Contracting Officer under the Government prime contract. (DAR 7-104.41)

#### 49. SUBCONTRACTOR COST OR PRICING DATA--PRICE ADJUSTMENTS (1970 JAN)

(a) Paragraphs (b) and (c) of this clause shall become operative only with respect to any modification made pursuant to one or more provisions of this contract which involves aggregate increases and/or decreases in costs plus applicable profits expected to exceed \$500,000. The requirements of this clause shall be limited to such modifications.

(b) The Contractor shall require subcontractors hereunder to submit cost or pricing data under the following circumstances: (i) prior to the award of any subcontract the amount of which is expected to exceed \$500,000 when entered into; (ii) prior to the pricing of any subcontract modification which involves aggregate increases and/or decreases in costs plus applicable profits expected to exceed \$500,000; except where the price is based on adequate price competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation.

(c) The Contractor shall require subcontractors to certify that to the best of their knowledge and belief the

cost and pricing data submitted under (b) above is accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract change or modification.

(d) The Contractor shall insert the substance of this clause including this paragraph (d) in each subcontract which exceeds \$500,000. (DAR 7-104.42(b))

50. GOVERNMENT-FURNISHED PROPERTY  
(SHORT FORM) (1964 NOV)

(a) The Government shall deliver to the Contractor, for use only in connection with this contract, the property described in the schedule or specifications (hereinafter referred to as "Government-furnished property"), at the times and locations stated therein. If the Government-furnished property, suitable for its intended use, is not so delivered to the Contractor, the Contracting Officer shall, upon timely written request made by the Contractor, and if the facts warrant such action, equitably adjust any affected provision of this contract pursuant to the procedures of the "Changes" clause hereof.

(b) Title to Government-furnished property shall remain in the Government. The Contractor shall maintain adequate property control records of Government-furnished property in accordance with sound industrial practice.

(c) Unless otherwise provided in this contract, the Contractor upon delivery to him of any Government-furnished property, assumes the risk of, and shall be responsible for, any loss thereof or damage thereto except for reasonable wear and tear, and except to the extent that such property is consumed in the performance of this contract.

(d) The Contractor shall, upon completion of this contract, prepare for shipment, deliver f.o.b. origin, or dispose of all Government-furnished property not consumed in the performance of this contract or not therefore delivered to the Government, as may be directed or authorized by the Contracting Officer. The net proceeds of any such disposal shall be credited to the contract price or paid in such other manner as the Contracting Officer may direct. (DAR 7-104.24(f))

51. VARIATIONS IN ESTIMATED QUANTITIES  
(1968 APR)

Where the quantity of a pay item in this contract is an estimated quantity and where the actual quantity of such pay item varies more than fifteen percent (15%) above or below the estimated quantity stated in this contract, an equitable adjustment in the contract price shall be made upon demand of either party. The equitable adjustment shall be based upon any increase or decrease in costs due solely to the variation above one hundred fifteen percent (115%) or below eighty-five percent (85%) of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the Contracting Officer shall, upon receipt of a written request for an extension of time within ten (10) days from the beginning of such delay, or within such further period of time which may be granted by the Contracting Officer prior to the date of final settlement of the contract, ascertain the facts and make such adjustment for extending the completion date as in his judgment the findings justify. (DAR 7-603.27)

52. SALVAGE MATERIALS AND EQUIPMENT  
(1965 JAN)

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 his negligence, or while in his care. (DAR 7-603.29)

53. AVAILABILITY AND USE OF UTILITY SERVICES (1967 APR)

This clause shall be applicable only if so expressly stated in the Schedule, or specification, or Invitation for Bids.

(a) The Government will make available to the Contractor, from existing outlets and supplies, all reasonably required amounts of utilities as specified in the Schedule or specifications. Except as otherwise provided in the Schedule or specifications, each utility 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 as determined by the Contracting Officer.

(b) The Contractor shall carefully conserve utilities furnished without charge. The Contractor, at his own expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines and, if necessary to determine charges, all meters required to measure the amount of each utility used; and he shall remove the same prior to final acceptance of the construction. (DAR 7-603.30)

54. MISPLACED MATERIAL (1965 JAN)

Should the Contractor, during the progress of the work lose, dump, throw overboard, sink, or misplace any material, plant, machinery, or appliance, which in the opinion of the Contracting Officer may be dangerous to or obstruct navigation, the Contractor shall recover and remove the same with the utmost dispatch. The Contractor shall give immediate notice, with description and location of such obstructions, to the Contracting Officer or inspector, and when required shall mark or buoy such obstructions until the same are removed. Should he refuse, neglect, or delay compliance with the above requirements, such obstructions may be removed by the Contracting Officer, and the cost of such removal may be deducted from any money due or to become due the Contractor, or may be recovered under his bond. The liability of the Contractor for the removal of a vessel wrecked or sunk without fault or negligence shall be limited to that provided in Sections 15, 19, and 20 of the River and Harbor Act of March 3, 1899. (33 U.S.C. 410 et seq.)(DAR 7-603.32)

55. SIGNAL LIGHTS (1965 JAN)

The Contractor shall display signal lights and conduct his operations in accordance with the General Regulations of the Department of the Army and of the Coast Guard governing lights and day signals to be displayed by towing vessels with tows on which no signals can be displayed, vessels working on wrecks, dredges, and vessels engaged in laying cables or pipe or in submarine or bank protection operations, lights to be displayed on dredge pipe lines, and day signals to be displayed by vessels of more than 65 feet in length moored or anchored in a fairway or channel, and the passing by other vessels of floating plant working

in navigable channels, as approved by the Secretary of the Army (33 C.F.R. 201.1-201.16) and the Commandant, U.S. Coast Guard (33 C.F.R. 80.18-31a and 33 C.F.R. 95.51-95.70). (DAR 7-603.33)

56. IDENTIFICATION OF EMPLOYEES  
(1965 JAN)

The Contractor shall be responsible for furnishing to each employee and for requiring each employee engaged on the work to display such identification as may be approved and directed by the Contracting Officer. All prescribed identification shall immediately be delivered to the Contracting Officer, for cancellation upon the release of any employee. When required by the Contracting Officer, the Contractor shall obtain and submit fingerprints of all persons employed or to be employed on the project. (DAR 7-603.34)

57. TIME EXTENSIONS (1965 JAN)

Notwithstanding any other provisions of this contract it is mutually understood that the time extensions for changes in the work will depend upon the extent, if any, by which the changes cause delay in the completion of the various elements of construction. The change order granting the time extension may provide that the contract completion date will be extended only for those specific elements so delayed and that the remaining contract completion dates for all other portions of the work will not be altered and may further provide for an equitable readjustment of liquidated damages pursuant to the new completion schedule. (DAR 7-603.36)

58. UTILIZATION OF WOMEN-OWNED  
BUSINESS CONCERNS (OVER \$10,000)  
(1980 AUG)

(a) It is the policy of the United States Government that women-owned

businesses shall have the maximum practicable opportunity to participate in the performance of contracts awarded by any Federal agency.

(b) The Contractor agrees to use its best efforts to carry out this policy in the award of subcontracts to the fullest extent consistent with the efficient performance of this contract. As used in this contract, a "women-owned business" concern means a business that is at least 51 percent owned by a woman or women who are U.S. citizens and who also control and operate the business and that is a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto. "Control" in this context means exercising the power to make policy decisions. "Operate" in this context means being actively involved in the day-to-day management.

(c) Contractors acting in good faith may rely on written representations by their subcontractors regarding their status as women-owned business concerns. (DAR 7-104.52)

59. PROGRESS CHARTS AND REQUIREMENTS  
FOR OVERTIME WORK (1965 JAN)

(a) The Contractor shall within 5 days or within such time as determined by the Contracting Officer, after date of commencement of work, prepare and submit to the Contracting Officer for approval a practicable schedule, showing the order in which the Contractor proposes to carry on the work, the date on which he will start the several salient features (including procurement of materials, plant and equipment) and the contemplated dates for completing the same. The schedule may be in any form, at the option of the Contractor, but shall maintain current with each submittal, at least the following information:

(1) The various classes and areas of work, broken down into:

a. Times projected for submittals, approvals, and procurement.

b. Times for installation and erection.

c. Times for testing and inspection.

(2) The work completed and the work remaining to be done to complete the project.

(3) Any items of work which will delay the start or completion of other major items of work so as to delay completion of the whole project.

The Contractor shall submit an updated copy of his schedule with each invoice, and when required by major changes in the work. If the Contractor fails to submit a progress schedule within the time herein prescribed, the Contracting Officer may withhold approval of progress payments until such time as the Contractor submits the required progress schedule.

(b) If, in the opinion of the Contracting Officer, the Contractor falls behind the progress schedule, the Contractor shall take such steps as may be necessary to improve his progress and the Contracting Officer may require him to increase the number of shifts, or overtime operations, days of work, or the amount of construction planned or all of them, and to submit for approval such supplementary schedule or schedules in chart form as may be deemed necessary to demonstrate the manner in which the agreed rate of progress will be regained, all without additional cost to the Government.

(c) Failure of the Contractor to comply with the requirements of the

Contracting Officer under this provision shall be grounds for determination by the Contracting Officer that the Contractor is not prosecuting the work with such diligence as will insure completion within the time specified. Upon such determination the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part thereof, in accordance with the clause of the Contract entitled "Termination for Default-Damages for Delay-Time Extensions." (DAR 7-603.48)

#### 60. PERFORMANCE OF WORK BY CONTRACTOR (1965 JAN)

The Contractor shall perform on the site, and with his own organization, work equivalent to at least 20 percent of the total amount of the work to be performed under the contract. If during the progress of the work the Contractor requests a reduction in such percentage and the Officer in Charge of Construction determines that it would be to the Government's advantage, the percentage of the work hereunder required to be performed by the Contractor may be reduced, provided written approval of such reduction is obtained from the Officer in Charge of Construction. (DAR 7-603.15)

#### 61. LAYOUT OF WORK (1965 JAN)

The Contractor shall layout his work from Government-established base lines and bench marks indicated on the drawings and shall be responsible for all measurements in connection therewith. The Contractor shall furnish, at his own expense, all stakes, templates, platforms, equipment, tools, and materials and labor as may be required in laying out any part of the work from the base lines and bench marks established by the Government. The Contractor will be held responsible for

the execution of the work to such lines and grades as may be established or indicated by the Officer in Charge of Construction. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other marks established by the Officer in Charge of Construction until authorized to remove them. If such marks are destroyed, by the Contractor or through his negligence, prior to their authorized removal, they may be replaced by the Officer in Charge of Construction at his discretion. The expense of replacement will be deducted from any amounts due or to become due the Contractor. (DAR 7-604.3)

62. WARRANTY OF CONSTRUCTION  
(1974 APR)

(a) In addition to any other warranties set out elsewhere in this contract, the Contractor warrants that 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 of his subcontractors or suppliers at any tier. Such warranty shall continue for a period of one year from the date of final acceptance of the work, but with respect to any part of the work which the Government takes possession of prior to final acceptance, such warranty shall continue for a period of one year from the date the Government takes possession. Under this warranty, the Contractor shall remedy at his own expense any such failure to conform or any such defect. In addition, the Contractor shall remedy at his own expense any damage to Government owned or controlled real or personal property, when that damage is the result of the Contractor's failure to conform to contract requirements or any such defect of equipment, material, workmanship, or design. The Contractor

shall also restore any work damaged in fulfilling the terms of this clause. The Contractor's warranty with respect to work repaired or replaced hereunder will run for one year from the date of such repair or replacement.

(b) The Government shall notify the Contractor in writing within a reasonable time after the discovery of any failure, defect, or damage.

(c) Should the Contractor fail to remedy any failure, defect, or damage described in (a) above within a reasonable time after receipt of notice thereof, the Government shall have the right to replace, repair, or otherwise remedy such failure, defect, or damage at the Contractor's expense.

(d) In addition to the other rights and remedies provided by this clause, all subcontractors', manufacturers', and suppliers' warranties expressed or implied, respecting any work and materials shall, at the direction of the Government, be enforced by the Contractor for the benefit of the Government. In such case if the Contractor's warranty under (a) above has expired, any suit directed by the Government to enforce a subcontractor's, manufacturer's or supplier's warranty shall be at the expense of the Government. The Contractor shall obtain any warranties which the subcontractors, manufacturers, or suppliers would give in normal commercial practice.

(e) If directed by the Contracting Officer, the Contractor shall require any such warranties to be executed in writing to the Government.

(f) Notwithstanding any other provision of this clause, unless such a defect is caused by the negligence of the Contractor or his subcontractors or

suppliers 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 such defect in Government furnished material or design.

(g) The warranty specified herein shall not limit the Government's rights under the "Inspection and Acceptance" clause of this contract with respect to latent defects, gross mistake, or fraud.

(h) 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. The Contractor shall require any subcontractors, manufacturers, or suppliers thereof to execute their warranties in writing directly to the Government. (DAR 7-604.4)

### 63. VALUE ENGINEERING INCENTIVE (1977 AUG)

(a) Application. This clause applies to a contractor developed and documented Value Engineering Change Proposal (VECP) which:

(i) requires a change to this contract to implement the VECP, and

(ii) reduces the contract price without impairing essential function or characteristics, provided that it is not based solely on a change in deliverable end item quantities.

(b) Documentation. As a minimum, the following information shall be submitted by the Contractor with each VECP:

(i) a description of the difference between the existing contract requirement and the proposed change,

and the comparative advantages and disadvantages of each, justification where function or characteristics of a work item is being altered, and the effect of the change on the performance of the end item;

(ii) an analysis and itemization of the requirements of the contract which must be changed if the VECP is accepted and a recommendation as to how to make each such change (e.g., a suggested specification revision);

(iii) a separate detailed cost estimate for both the existing contract requirement and the proposed change to provide an estimate of the reduction in costs, if any, that will result from acceptance of the VECP, taking into account the costs of development and implementation by the Contractor (including any amount attributable to subcontracts in accordance with paragraph (f) below):

(iv) a prediction of any effects the proposed change would have on related costs to the Military Department such as Government-furnished property costs, and costs of maintenance and operation;

(v) a statement of the time by which a change order adopting the VECP must be issued so as to obtain the maximum cost reduction during the remainder of this contract, noting any effect on the contract completion time or delivery schedule; and

(vi) identification of any previous submission of the VECP, including the dates submitted, the agencies involved, the numbers of the Government contracts involved, and the previous actions by the Government, if known.

(c) Submission. To expedite a determination, VECPs shall be submitted

to the Resident Engineer at the work-site with a copy to the Contracting Officer. Proposals shall be processed expeditiously; however, the Government shall not be liable for any delay in acting upon any proposal submitted pursuant to this clause. If the evaluation period is likely to exceed 45 calendar days, the PCO shall promptly notify the Contractor of the estimated decision date and provide the reasons for the additional time required. The Contractor has the right to withdraw, in whole or in part, any VECP not accepted by the Government within the period specified in the VECP.

(d) Acceptance. The Contracting Officer may accept, in whole or in part, by contract modification any VECP submitted pursuant to 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 remain obligated to perform in accordance with this contract. Contract modification made pursuant to this clause will so state. The decision of the Contracting Officer as to the acceptance of any VECP under this contract shall be final and shall not be subject to the "Disputes" clause of this contract.

(e) Sharing. If a VECP submitted by the Contractor pursuant to this clause is accepted, the contract price shall be adjusted without regard to profit in accordance with the following provisions:

(i) Definition:

(A) Instant contract savings to the Contractor (ICS) are the estimated reduction in the Contractor's

cost of performance resulting from the acceptance of the VECP. The proposed cost reduction includes estimated allowable Contractor development and implementation costs (CC). The Contractor's development and implementation costs include any subcontractor development and implementation costs (see (f) below). For purposes of this clause, Contractor development costs are those costs incurred after the Contractor has identified a specific VE project and prior to acceptance and implementation by the Government.

(B) Government Costs (GC) are those DoD costs which directly result from development and implementation of the VECP, such as test and evaluation of the VECP.

(ii) Calculations and Actions. Multiply ICS by 45% and GC by 55%. Add these two results, e.g., (.45 ICS plus .55 GC) and subtract from the contract price.

(f) Subcontracts. The Contractor shall include appropriate VE arrangements in any subcontract of \$50,000 or greater, and may include such arrangements in contracts of lesser value. To compute any adjustment in the contract price under paragraph (e) above, the Contractor's cost of development and implementation of a VECP which is accepted under this contract shall include any development and implementation costs of a subcontractor which clearly pertains to such VECP, but shall exclude any VE incentive payments which the Contractor may make to a subcontractor. The Contractor may make whatever VE incentive payment arrangements he chooses with his subcontractors, provided that any payments to subcontractors under such arrangements are made from the Contractor's, and not the Government's, share of the savings resulting from the VECP.

(g) Data. The Contractor may restrict the Government's right to use any sheet of a VECP or of the supporting data, submitted pursuant to this clause, in accordance with the terms of the following legend if it is marked on such sheet:

"This data furnished pursuant to the Value Engineering Incentive 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 VECP submitted under said clause. This restriction does not limit the Government's right to use information contained in this data if it is or has been obtained, or is otherwise available, from the Contractor or from another source, without limitations."

In the event of acceptance of a VECP, the Contractor hereby grants to the Government unlimited rights, as defined in the clause of DAR 7-104.9(a), in the VECP and supporting data, except that, with respect to data which qualifies as and is submitted as limited rights technical data in accordance with the clause of DAR 7-104.9(a), the Government shall have the rights specified in the contract modification referred to in paragraph (d) hereof and the data shall be appropriately marked. (DAR 7-602.50)

64. VALUE ENGINEERING COST COMPUTATION (1-75)

In computing the instant contract savings to the Contractor (ICS), under

Clause 66, "Value Engineering Incentive (1977 Aug)," there shall not be taken into consideration any Value Engineering incentive payments which the Contractor may make to the subcontractor, i.e., such amounts will not be deemed a development and implementation cost at any tier.

65. REQUIRED INSURANCE (1977 JAN)

(a) The Contractor shall procure and maintain during the entire period of this performance under this contract the following minimum insurance.

COVERAGE

Type of Insurance	Per Person	Per Accident	Property
1. Comprehensive General Liability	\$300,000	\$1,000,000	\$100,000
2. Automobile Liability	\$300,000	\$1,000,000	\$100,000
3. Workmen's	As required		
4. (Other as required by State Law)			

(b) Prior to commencement of work hereunder, the Contractor shall furnish to the Contracting Officer a certificate or written statement of the above required insurance. The policies evidencing required insurance shall contain an endorsement to the effect that cancellation or any material change in the policies adversely affecting the interests of the Government in such insurance shall not be effective for such period as may be prescribed by the laws of the State in which this contract is to be performed and in no event less than thirty (30) days after written notice thereof to the Contracting Officer.

(c) The Contractor agrees to insert the substance of this clause, including this paragraph (c), in all subcontracts hereunder. (DAR 7-603.10)

#### 66. GOVERNMENT REPRESENTATIVES (6-72)

(a) The work will be under the general direction of the Contracting Officer, the Commander Naval Facilities Engineering Command, who shall designate an officer of the Civil Engineer Corps, United States Navy, or other officer or representative of the Government, as Officer in Charge of Construction, referred to as the "OICC", who except in connection with the "Disputes" clause shall be the authorized representative of the Contracting Officer and under the direction of the Contracting Officer have complete charge of the work, and shall exercise full supervision and general direction of the work, so far as it affects the interest of the Government. For the purposes of the "Dispute" clause the Contracting Officer shall mean the Commander, Naval Facilities Engineering Command, the Acting Commander, their successors, or their representatives specially designated for this purpose.

(b) The provisions in this clause or elsewhere in this contract regarding supervision, approval or direction by the Contracting Officer or the OICC or action taken pursuant thereto are not intended to and shall not relieve the Contractor of responsibility for the accomplishment of the work either as regards sufficiency or the time of performance, except as expressly otherwise provided herein.

#### 67. SPECIFICATIONS AND DRAWINGS (6-72)

To Clause 2 add the following paragraphs:

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

(c) Deviations. Deviations from the drawings and dimensions therein given, whether or not error is believed to exist, shall be made only after written authority is obtained from the OICC.

#### 68. PRECEDENCE (6-72)

In the event of conflict or inconsistency between any of the provisions of the various portions of this contract (the reconciliation of which is not otherwise provided for here), precedence shall be given in the following order, the provisions of any particular portion prevailing over those of a subsequently listed portion.

(1) Typewritten portions of the contract.

(2) the specifications referred to in Standard Form 23 (including all addenda, and mechanical and technical but not contractual aspects of incorporated provisions) as specifically amended herein, if amended.

(3) printed provisions of the contract form, including printed provisions of added slip sheets.

#### 69. ORAL MODIFICATION (6-72)

No oral statement of any person whomsoever shall in any manner or degree modify or otherwise affect the terms of this contract.

70. NO WAIVER BY GOVERNMENT (6-72)

The failure of the Government in any one or more instances to insist upon the strict performance of any of the terms of this contract or to exercise any option herein conferred, shall not be construed as a waiver or relinquishment to any extent of the right to assert or rely upon such terms or option on any future occasion.

71. SUPERSEDURE (6-72)

If this contract has been preceded by a Letter or Dispatch of Intent or a Notice of Award, anticipating the execution of this contract then such Letter or Dispatch or Notice and all rights and obligations of the parties thereunder are superseded and merged into this contract. All acts of the Contractor and the Government and all payments, if any, made by the Government under said Letter or Dispatch or Notice shall be deemed to have been under this contract.

72. SANITATION (6-72)

Adequate sanitary conveniences of any approved type for the use of persons employed on the work, and properly secluded from public observation, shall be constructed and maintained by the Contractor in such a manner and at such points as shall be required or approved by the OICC. These conveniences shall be maintained at all times without nuisance and their use shall be strictly enforced. Upon completion of the work they shall be removed from the premises, leaving the premises clean and free from nuisance.

73. TESTING FOUNDATIONS (6-72)

Tests of the bearing value of the material underlying the foundation of the structure to be built shall be made at such times and places and in such a

manner as may be directed by the OICC. As far as practicable, test piles, when used, shall be so located that they can become part of the finished structure. The Contractor shall furnish OICC ample opportunity for viewing tests and making such records as the latter may consider advisable. The Contractor shall be entitled to compensation for making such tests in the same manner as for a change required by the OICC under Clause 3 to the extent the contract price does not include compensation therefor. Notice must be given of intention to request compensation in accordance with Clause 3.

74. PAYMENT TO CONTRACTOR (6-72)

(a) To Clause 7 add the following sentence at the end of paragraph (a) and add paragraph (g) below:

Such payments shall be made on submission of itemized requests by the Contractor and shall be subject to reduction for overpayments or increase for underpayments on preceding payments to the Contractor.

(g) The obligation of the Government to make any of the payments required under any of the provisions of this contract shall, in the discretion of the OICC, be subject to (1) reasonable deductions on account of defects in material or workmanship, and (2) any claims which the Government may have against the Contractor under or in connection with this contract. Any overpayments to the Contractor shall, unless otherwise adjusted, be repaid to the Government upon demand.

75. CHANGES BOARD AND ESTIMATES (2-81)

In determining any equitable adjustment under Clause 3, the OICC shall, in those instances where the adjustment to be made in compensation is

estimated by the OICC to amount to \$50,000 or more, convene, and give full consideration to the report of an advisory board of three members, consisting of two Government representatives appointed by the OICC and one representative appointed by the Contractor. This board shall estimate and report to the OICC the amount of the change in cost, time, or both, resulting from the ordered change. In making all equitable adjustments under Clause 3, compensation for additions will be based upon estimated costs at the time the work is performed and credit for deductions will be based upon estimated costs at the time the contract was made. To such cost estimates, 6 percent shall be added to adjust the Contractor's profits. In arriving at the amount of the change in price, if any, allowance may be made for overhead and general expenses, plant rental, and other similar items.

76. CONTRACTOR QUALITY CONTROL (CQC)  
(4-77)

This clause applies only when specifically required by the specifications.

(a) The contractor shall provide a quality control organization and system to perform inspections, tests, and retesting in the event of failure of all items of work, including that of his subcontractors, to assure compliance with the contract provisions. Quality control will be established for all work, except where specific provisions of the contract provide for Government approvals, inspections, and tests. The CQC system will specifically include, but not be limited to, the inspections and tests required in the technical provisions of the contract specifications and shall cover all construction operations, including both on-site and off-site fabrication.

(b) The contractor shall provide a CQC representative, supplemented as necessary by additional personnel, who shall be on the work at all times during progress, with complete authority to take any action necessary to ensure compliance with the contract. The CQC representative shall be appointed by a letter addressed to him and signed by an officer of the firm. This letter shall detail the CQC representative's authority and responsibility to act for the contractor. The CQC representative shall report directly to an officer of the firm, and shall not be the same individual as, nor be subordinate to, the job superintendent or project manager. The CQC representative shall have no job-related responsibilities other than quality control.

(c) The contractor shall furnish four copies of the CQC plan to the Contracting Officer within fifteen calendar days after receipt of the Notice of Award. The CQC plan shall detail the procedures, instructions, and reports to be used to assure compliance with the contract. Unless specifically authorized by the Contracting Officer in writing, no construction will be started until the CQC plan is approved. This plan will include, as a minimum:

(1) A copy of the letter appointing the CQC representative, signed by an officer of the firm, outlining the CQC representative's duties, responsibilities, and authority. This letter must include the authority to direct removal and replacement of any defective work.

(2) The quality control organization in chart form, showing the relationship of the quality control organization to other elements of the firm.

(3) Names and qualifications of personnel in the quality control organization.

(4) Area of responsibility and authority of each individual in the quality control organization.

(5) A listing of outside organizations such as testing laboratories, architects, and consulting engineers that will be employed by the contractor, and a description of the services these firms will provide.

(6) Procedures for reviewing all shop drawings, samples, certificates, or other submittals for contract compliance, including the name of the person(s) authorized to sign the submittals for the contractor, as complying with the contract.

(7) An inspection schedule, keyed to the construction schedule and following the order of the specification technical sections, indicating what inspections and tests, the names of persons responsible for the inspection and testing for each segment of work, and the time schedule for each inspection and test.

(8) The procedures for documenting quality control operation, inspection, and testing, with a copy of all forms and reports to be used for this purpose. The contractor shall also include a submittal status log listing all submittals required by the specifications and stating the action required by contractor or the Government. The contractor shall complete columns (a) through (e) of this log and name the persons authorized to review the submittals.

(d) Inspection procedures shall include, as a minimum:

(1) Preparatory Inspection. Preparatory Inspection shall be performed before beginning any work, and in addition, before beginning each segment of work. Preparatory Inspection shall include a review of the contract requirements, the review and approval of shop drawings and other submittal data, a check to assure that required control testing will be provided, a physical examination to assure that all materials and equipment conform to approved shop drawings and submittal data, and a check to assure that all required preliminary work has been completed.

(2) Initial Inspection. An Initial Inspection shall be performed as soon as a representative segment of the particular item of work has been accomplished. Initial inspection shall include performance of scheduled tests, examination of the quality of workmanship, a review of test results for compliance with contract requirements, a review for omissions or dimensional errors, and approval or rejection of the initial segment of the work.

(3) Follow-up Inspections. Follow-up Inspections shall be performed daily, and more frequently as necessary, and shall include continued testing and examinations to assure continued compliance with the contract requirements.

(e) At least five days after the CQC Plan is submitted, but before construction operations are started, the contractor shall meet with the Contracting Officer and discuss the quality control requirements. The purpose of the meeting shall be to develop a mutual understanding relative to details of the system, including forms to be used for recording the quality control operations, inspections, tests, approvals, certifications, administration of the system, and Government surveillance. This meeting shall also

develop a schedule for future weekly or biweekly CQC meetings and shall establish procedures for submission of daily reports and other records and documents.

(f) The contractor shall submit daily CQC reports to the Contracting Officer identifying prime and subcontractor personnel and equipment on the site, idle equipment and personnel, material deliveries, weather conditions, work accomplished, inspections and tests conducted, results of inspection and tests, nature of defects found, causes for rejection, proposed remedial action, and corrective actions taken, together with the following certification: "On behalf of the contractor, I certify that this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications, to the best of my knowledge, except as noted above." This certification shall be signed for the contractor by the authorized CQC representative.

(g) Test results provided shall cite the contract requirements, the test or analysis procedures used, and the actual tests results, and include a statement that the item tested or analyzed conforms or fails to conform to the specification requirements. Each report shall be conspicuously stamped on the cover sheet in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements as the case may be. All test reports shall be signed by a testing laboratory representative authorized to sign certified test reports. The contractor shall arrange for immediate and direct delivery of the signed original of all reports, certifications, and other documentation to the Contracting Officer.

(h) All submittals, shop drawings, catalog cuts, samples, etc., unless otherwise specifically noted, shall be approved and certified by the contractor as conforming to the drawings and specifications. Four copies of all shop drawings, catalog cuts, or other submittals, with the contractor's approval indicated thereon, shall be sent to the Contracting Officer within one working day of the contractor's approval.

77. DAMAGES FOR DELAY--DEFENSE  
MATERIALS SYSTEM AND PRIORITIES  
(6-72)

The Government will take no action pursuant to Clause 5 of Standard Form 23A to terminate the right of the Contractor to proceed or to assess liquidated or actual damages where failure of the Contractor to complete the work within the time specified is due solely to the operation of the Defense Materials System and Priorities, provided the Contractor and his subcontractors comply with the provisions of this System and the Contractor's lateness in completion of the work is not otherwise caused by the fault or negligence of the Contractor. Such delays will be excusable within the meaning of Clause 5, and the Contractor will be entitled to a time extension by reason thereof.

78. SPECIFICATIONS AND STANDARDS  
(6-72)

The specifications and standards referenced in this specification (including addenda, amendments, and errata listed) shall govern in all cases where references thereto are made. In case of differences between these specifications or standards and this specification or its accompanying drawings, this specification and its accompanying drawings shall govern to the extent of such differences; otherwise, the referenced specifications and standards,

shall apply. The requirement for packaging, packing, marking, and preparation for shipment or delivery included in the referenced specifications shall apply only to materials and equipment that are furnished directly to the Government and not to materials and equipment that are to be furnished and installed by the Contractor.

(a) When a number in parenthesis is suffixed to a NAVFAC, NAVDOCKS, Military or Federal Specification, it denotes the effective amendment or change to the document. Amendments to Federal and Military Specifications shall be designated by placing the notation, "Amendment 1" under the basic specification designation.

(b) Unless otherwise specified by this contract specification, all tests required by the referenced specifications and standards shall be conducted at no expense to the Government under the supervision of and in a laboratory acceptable to the Government.

(c) Application for specifications other than NAVFAC, Yards and Docks, Military or Federal specifications should be made to the organizations publishing them. NAVFAC, Yards and Docks, Federal, and Military specifications may be ordered from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120. However, a copy of all referenced documents will be available for examination only at the office of the Officer in Charge of Construction.

#### 79. SECURITY REQUIREMENTS (6-72)

No employee or representative of the Contractor will be admitted to the site of the work unless he furnishes satisfactory proof that he is a citizen

of the United States or, is specifically authorized admittance to the site of the work by the OICC.

#### 80. STATION REGULATIONS (6-72)

The Contractor and his employees and subcontractors shall become familiar with and obey all Station regulations, including fire, traffic, and security regulations. All personnel employed on the station shall keep within the limits of the work (and avenues of ingress and egress), and shall not enter any restricted areas unless required to do so and are cleared for such entry. The Contractor's equipment shall be conspicuously marked for identification.

#### 81. ORDER OF WORK (8-75)

The Contractor shall schedule his work as to cause the least amount of interference with Station operations. Work schedules shall be subject to the approval of the Officer in Charge of Construction. Permission to connect or interrupt any Station Roads, Railroads and/or utility service shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption.

#### 82. SCHEDULES OF PRICES (6-72)

Within 5 days of receipt of a Notice of Award, the Contractor shall prepare and submit to the Officer in Charge of Construction, a Schedule of Prices (Construction Contract), NAVFAC 4330/4. The schedule shall consist of a detailed breakdown of the contract price, giving the quantities for each of the various kinds of work, the unit prices, and the total prices therefor. The detailed breakdown shall be segregated under each of the construction categories given hereinafter. The required schedule must be based on the

actual breakdown of the bid price. Accordingly, subcontractors who may be involved in work under more than one of these categories shall be advised of this requirement in order to assure their being in a position to furnish these data without delay. The format, content and number of copies required shall be as further prescribed by the Officer in Charge of Construction and shall be subject to his approval. The submission of the required data shall not otherwise affect the contract terms. Form NAVFAC 4330/4 will be furnished by the Officer in Charge of Construction.

83. CONTRACTOR'S INVOICE AND CONTRACT PERFORMANCE STATEMENT (6-72)

Requests for payment in accordance with the terms of the contract shall consist of:

(a) Contractor's Invoice on form NAVFAC 10-7300/30, which shall show, in summary form, the basis for arriving at the amount of the invoice, and

(b) Contract Performance Statement on form NAVFAC 10-7300/31, which shall show in detail, the estimated cost percentage of completion and value of completed performance for each of the construction categories given hereinafter. The format, content, and number of copies required shall be as further prescribed by the Officer in Charge of Construction and shall be subject to his approval. The submission of the required data shall not otherwise affect the contract terms. Forms NAVFAC 10-7300/30 and 10-7300/31 will be furnished by the Officer in Charge of Construction.

84. AS-BUILT RECORD OF MATERIALS USED IN BUILDINGS (6-72)

Prior to completion of the contract, the Contractor shall furnish an

"as-built" record of materials used in the construction. Submittal of this data is made a condition for final payment under the contract. Where several manufacturer's brands, types, or classes of the item listed have been used in the project, the specific areas where each item was used shall be designated. Designations shall be keyed to the area and space designations on the contract drawings.

85. OPTIONAL REQUIREMENTS (6-72)

Where a choice of materials and/or methods is permitted herein, the Contractor will be given the right to exercise the option unless stated specifically otherwise.

86. PROPOSED MATERIAL SUBMITTALS REQUIRED OF THE CONTRACTOR (6-72)

Proposed material submittals required of the Contractor shall be made allowing sufficient time for processing, reviews, approval, and procurement before the Contractor is ready to use the material. No material shall be used prior to written approval. Submittals shall be prepared and assembled as follows:

(a) Submit seven copies of each submittal.

(b) Present all submittals for each specification section as a complete bound volume, titled with project title and contract number.

(c) Provide index of included items with each volume. Title the index with applicable specification section name and number.

(d) Clearly mark each item in volume with specification paragraph number to which it pertains.

(e) Assemble each volume in same numerical sequence as specifications section paragraphs.

(f) See individual technical sections for additional information.

The Contractor shall certify on all submittals that the material being proposed conforms to contract requirements. In the event of any variance, the Contractor shall state specifically which portions vary, and request approval of a substitute. The Contractor shall also certify that all Contractor-furnished equipment can be installed in the allocated spaces. Incomplete submittals and submittals with inadequate data will be rejected.

#### 87. CATALOG DATA (6-72)

Catalog data shall be printed pages on permanent copies of the manufacturer's catalogs.

#### 88. SAMPLES (6-72)

Samples in the number specified, shall be shipped prepaid, and delivered as directed by the Officer in Charge of Construction. Samples shall be marked to show name of material, name of supplier, contract number, segment of work where material represented by sample is to be used, and name of Contractor submitting sample.

#### 89. STORM PROTECTION (6-72)

Should warnings of winds of gale force or stronger be issued, the Contractor shall take every practicable precaution to minimize danger to person, to the work and to adjacent property.

#### 90. CONTRACTOR'S DAILY REPORT (6-72)

The Contractor will be required to submit a "Daily Report to Inspector,"

Form NAVFAC 4330/34. The forms shall be completed daily and delivered to the Office in Charge of Construction. Data to be included in the form is data on workers by classification, the move-on and move-off of construction equipment furnished by the prime and subcontractor or furnished by the Government, and materials and equipment delivered to the site of installation in the work.

If Clause 76, "Contractor Quality Control" is applicable to this contract, the information required by this clause shall be submitted as a part of the reports required under Clause 76.

#### 91. WORK OUTSIDE REGULAR HOURS (6-72)

If the Contractor desires to carry on work outside regular hours or on Saturdays, Sundays, or holidays, he shall submit application to the Officer in Charge of Construction, but shall allow ample time to enable satisfactory arrangements to be made by the Government for inspecting the work in progress. At night, he shall light the different parts of the work in an approved manner. All utility cutovers shall be made after normal working hours or on weekends. Anticipated costs shall be included in the bid.

#### 92. EXISTING WORK (6-72)

The disassembling, disconnecting, cutting, removal or altering in any way of existing work shall be carried on in such a manner as to prevent injury or damage to all portions of existing work, whether they are to remain in place, be re-used in the new work, or be salvaged and stored. All portions of existing work which have been cut, damaged or altered in any way during construction operations shall be repaired or replaced in kind and in an approved manner to match existing or

adjoining work. All work of this nature shall be performed by the Contractor at his expense and shall be as directed. Existing work shall, at the completion of all operations, be left in a condition as good as existed before the new work started.

93. SUBCONTRACTING PLAN FOR SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS CONCERNS (FORMALLY ADVERTISED) (1980 AUG)

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

(b) The apparent low bidder, upon request by the Contracting Officer, shall submit a subcontracting plan which addresses separately subcontracting with small business concerns and small disadvantaged business concerns, and which shall be included in and made a material part of the resultant contract. The subcontracting plan shall be submitted within the time specified by the Contracting Officer. Failure to submit the subcontracting plan shall make the bidder ineligible for the award of the contract. As a minimum, the subcontracting plan shall include:

(1) Separate percentage goals (expressed in terms of percentage of total planned subcontracting dollars) for the utilization as subcontractors of small business concerns and small business concerns owned and controlled by socially and economically disadvantaged individuals; for the purposes of the subcontracting plan, the Contractor shall include all subcontracts to be awarded for the specific purpose of performing this contract and may include a proportionate share of supplies and services whose costs are normally allocated as indirect or overhead costs when reasonably determined to be attributable to this contract.

a. A statement of: (i) total dollar planned to be subcontracted; (ii) total dollars planned to be subcontracted to small business; and (iii) total dollars planned to be subcontracted to small disadvantaged business.

b. A description of the principal supply and service areas to be subcontracted and an identification of those areas where it is planned to use (i) small business subcontractors, and (ii) small disadvantaged business subcontractors.

c. A statement of the method used in developing proposed subcontracting goals for small business and small disadvantaged business concerns.

d. If the offeror includes indirect and overhead costs as an element in establishing the goals in the subcontracting plan, the method used in determining the proportionate share of indirect and overhead costs incurred with (i) small business, and (ii) small disadvantaged business subcontractors shall be explained.

e. A statement of the method used for solicitation purposes (e.g., did the offeror use company source lists, the small business and disadvantaged small business source identification system provided by the Small Business Administration's Procurement Automated Source System, the National Minority Purchasing Council Vendor Information Service, or the services provided by the U.S. Department of Commerce Minority Business Development Agency's Research and Information Division, and the facilities of small business and disadvantaged business trade associations?).

(2) The name of an individual within the employ of the bidder who

will administer the subcontracting plan of the bidder and a description of the duties of such individual;

(3) A description of the efforts the bidder will make to assure that small business and small disadvantaged business concerns will have an equitable opportunity to compete for subcontracts;

(4) Assurances that the bidder will include the clause entitled Utilization of Small Business and Small Disadvantaged Business Concerns in all subcontracts which offer further subcontracting possibilities in the United States, and that the bidder will require all subcontractors (except small business concerns) who receive subcontracts in excess of \$1 million in the case of a contract for the construction of any public facility, or in excess of \$500,000 in the case of all other contracts, to adopt a plan in consonance with this clause;

(5) Assurances that the bidder will submit such periodic reports and cooperate in any studies or surveys as may be required by the contracting agency or the Small Business Administration in order to determine the extent of compliance by the bidder with the subcontracting plan; and

(6) A recitation of the types of records the successful bidder will maintain to demonstrate procedures which have been adopted to comply with the requirements and goals set forth in the plan, including the establishment of source lists of small business concerns and small disadvantaged business concerns; and efforts to identify and award subcontracts to such small business concerns. The records shall include at least the following (these

records may be maintained on a plant-wide or company-wide basis unless otherwise indicated):

a. Small and disadvantaged business source lists, guides, and other data identifying small and small disadvantaged business vendors.

b. Organizations contacted for small and disadvantaged business sources.

c. On a contract-by-contract basis, records on all subcontract solicitations over \$100,000, indicating on each solicitation (i) whether small business was solicited and if not, why not; (ii) whether small disadvantaged business was solicited and if not, why not; and (iii) reasons for the failure of responding small businesses or small disadvantaged businesses to receive the subcontract award.

d. Records to support such efforts as:

(i) contacts with disadvantaged and small business trade associations;

(ii) contacts with business development organizations; and

(iii) attendance at small and disadvantaged business procurement conferences and trade fairs.

e. Records to support internal activities to guide and encourage buyers such as:

(i) workshops, seminars, training programs, etc., and

(ii) monitoring activities to evaluate compliance.

f. On a contract-by-contract basis, records to support award data submitted to the Government to include name, address, and size status of subcontractor.

(c) In order to effectively implement this plan, the Contractor shall:

(1) Issue and promulgate company-wide policy statements in support of this effort, develop written procedures and work instructions, and assign specific responsibilities regarding the requirements of this clause.

(2) Demonstrate continuing management interest and involvement in support of these programs through such actions as regular reviews of progress and establishment of overall corporate and divisional goals and objectives.

(3) Train and motivate contractor personnel in support of these programs.

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

(5) Provide adequate and timely consideration of the potentialities of small business and small disadvantaged business concerns in all "make-or-buy" decisions.

(6) Counsel and discuss subcontracting opportunities with representatives of small and disadvantaged business firms as are referred by the Small and Disadvantaged Business Utilization Specialist responsible for monitoring performance under this program and representatives of the SBA.

(d) The Contractor shall submit Standard Form 295 in accordance with instructions provided on the form.

(e) The bidder understands that:

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

(2) The failure of any contractor or subcontractor to comply in good faith with (i) the clause entitled Utilization of Small Business Concerns and Small Disadvantaged Business Concerns, or (ii) the terms of any subcontracting plan required by this Small Business and Small Disadvantaged Business Subcontracting Plan (Advertised) provision, will be a material breach of the contract or subcontract.

(f) In the acquisition of commercial products, the bidder further understands that:

(1) If a commercial product (defined below) is offered, the required subcontracting plan may cover the company's production generally, both for Government contracts and for regular commercial sales, rather than just this acquisition. In such cases, the Contractor may request approval from the Contracting Officer to submit one company-wide, or division-wide, annual plan. If such request is deemed appropriate, the offeror shall submit

a proposed company-wide, or division-wide, annual plan for acceptance.

(2) Upon approval by the Contracting Officer, the plan will remain in effect for the company's entire fiscal year. During this period, Government contracts for commercial products of the affected company or division will not be required to contain individual subcontracting plans relating only to the supply or services being acquired, unless the Contracting Officer determines for a particular contract that there are unforeseen possibilities for small business and small disadvantaged business subcontracting.

(3) At least 60 days before the scheduled termination of the company or division-wide plan, the Contractor may submit to the Contracting Officer a proposed company or division-wide subcontracting plan for its commercial products for the succeeding fiscal year. If the plan would otherwise terminate prior to approval of the succeeding fiscal year's plan, it will remain in effect until the succeeding plan is accepted or rejected, but no longer than 60 days after the end of the company's fiscal year.

(4) For the purpose of this program, the term "commercial product" means a product in regular production sold in substantial quantities to the general public and/or industry at established catalog or market prices. A product which, in the opinion of the Contracting Officer, differs only insignificantly from the Contractor's commercial product may be regarded for the purpose of this clause as a commercial product. (DAR 7-104.14)

#### 94. PREFERENCE FOR DOMESTIC SPECIALTY METALS (1972 NOV)

(a) The Contractor agrees that any specialty metals (as hereinafter defined) furnished by it or purchased by it for direct incorporation in any article delivered to the Government under this contract shall have been melted in the United States, its possessions, or Puerto Rico, provided that this clause shall have no effect to the extent that the Secretary or his designee determines, as to any such articles, that a satisfactory quality and sufficient quantity cannot be procured as when needed at United States market prices.

(b) For the purposes of this clause, the term "specialty metals" means:

(i) steels, where the maximum alloy content exceeds one or more of the following limits: manganese, 1.65 percent; silicon, 0.60 percent; or copper 0.60 percent or which contains more than 0.25 percent of any of the following elements: aluminum, chromium, cobalt, columbium, molybdenum, nickel, titanium, tungsten, or vanadium;

(ii) metal alloys consisting of nickel, iron-nickel and cobalt base alloys containing a total of other alloying metals (except iron) in excess of ten percent (10%);

(iii) titanium and titanium alloys; or

(iv) zirconium and zirconium base alloys. (DAR 7-104.93(b))

#### 95. ENVIRONMENTAL LITIGATION (12-74)

(a) If the performance of all or any part of the work is suspended, delayed, or interrupted due to an order of a court of competent jurisdiction as

a result of environmental litigation as defined below, the Contracting Officer, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the Contractor or a Subcontractor at any tier not required by the terms of this contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a Subcontractor at any tier other than as required by the terms of this contract, such suspension, delay, or interruption shall be considered as if ordered by the Contracting Officer in the administration of this contract under the terms of the "Suspension of Work" clause of this contract. The period of such suspension, delay or interruption shall be considered unreasonable, and an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) as provided in that clause, subject to all the provisions thereof.

(b) The term "environmental litigation," as used herein, means a lawsuit alleging that the work will have an adverse effect on the environment or that the Government has not duly considered, either substantively or procedurally, the effect of the work on the environment.

96. COST ACCOUNTING STANDARDS  
(1978 MAY)

(Applicable only if the price of this contract exceeds \$100,000 and the contract is not exempt under DAR 3-1204.)

(a) Unless the Cost Accounting Standards Board has prescribed rules or regulations exempting the Contractor or this contract from standards, rules, and regulations promulgated pursuant to 50 U.S.C. App. 2168 (Public Law 91-379, August 15, 1970), the Contractor, in connection with this contract shall:

(1) By submission of a Disclosure Statement, disclose in writing his cost accounting practices as required by regulations of the Cost Accounting Standards Board. The required disclosures must be made prior to contract award unless the Contracting Officer provides a written notice to the Contractor authorizing post-award submission in accordance with regulations of the Cost Accounting Standards Board. The practices disclosed for this contract shall be the same as the practices currently disclosed and applied on all other contracts and subcontracts being performed by the Contractor and which contain this Cost Accounting Standards clause. If the Contractor has notified the Contracting Officer that the Disclosure Statement contains trade secrets and commercial or financial information which is privileged and confidential, the Disclosure Statement will be protected and will not be released outside the Government.

(2) Follow consistently the cost accounting practices disclosed pursuant to (1) above in accumulating and reporting contract performance cost data concerning this contract. If any change in disclosed practices is made for purposes of any contract or subcontract subject to Cost Accounting Standards Board requirements, the change must be applied prospectively to this contract, and the Disclosure Statement must be amended accordingly. If the contract price or cost allowance of this contract is affected by such changes, adjustment shall be made in accordance with subparagraph (a)(4) or (a)(5) below, as appropriate.

(3) Comply with all Cost Accounting Standards in effect on the date of award of this contract or if the Contractor has submitted cost or pricing data, on the date of final

agreement on price as shown on the Contractor's signed certificate of current cost or pricing data. The Contractor shall also comply with any Cost Accounting Standard which hereafter becomes applicable to a contract or subcontract of the Contractor. Such compliance shall be required prospectively from the date of applicability to such contract or subcontract.

(4)(A) Agree to an equitable adjustment as provided in the changes clause of this contract if the contract cost is affected by a change which, pursuant to (3) above, the Contractor is required to make his established cost accounting practices whether such practices are covered by a Disclosure Statement or not.

(B) Negotiate with the Contracting Officer to determine the terms and conditions under which a change may be made to either a disclosed cost accounting practice or an established cost accounting practice, other than a change made under provisions of this subparagraph (4): Provided, that no agreement may be made under this provision that will increase costs paid by the United States.

(C) When the parties agree to a change to either a disclosed cost accounting practice or an established cost accounting practice, other than a change order under (4)(A) above, negotiate an equitable adjustment as provided in the changes clause of this contract.

(5) Agree to an adjustment of the contract price or cost allowance, as appropriate, if he or a subcontractor fails to comply with an applicable Cost Accounting Standard or to follow any practice disclosed pursuant to subparagraphs (a)(1) and (a)(2) above and such failure results in any

increased cost paid by the United States. Such adjustment shall provide for recovery of the increased costs to the United States together with interest thereon computed at the rate determined by the Secretary of the Treasury pursuant to Public Law 92-41, 85 STAT. 97, or seven percent (7%) per annum, whichever is less, from the time the payment by the United States was made to the time the adjustment is effected.

(b) If the parties fail to agree whether the Contractor or a subcontractor has complied with an applicable Cost Accounting Standard, rule, or regulation of the Cost Accounting Standards Board and as to any cost adjustment demanded by the United States, such failure to agree shall be a dispute concerning a question of fact within the meaning of the disputes clause of this contract.

(c) The Contractor shall permit any authorized representatives of the head of the agency, of the Cost Accounting Standards Board, or of the Comptroller General of the United States to examine and make copies of any documents, papers, or records relating to compliance with the requirements of this clause.

(d) The Contractor shall include in all negotiated subcontracts which he enters into the substance of this clause except paragraph (b), and shall require such inclusion in all other subcontracts of any tier, including the obligation to comply with all Cost Accounting Standards in effect on the date of award of the subcontract of if the subcontractor has submitted cost or pricing data, on the date of final agreement on price as shown on the subcontractor's signed certificate of current cost or pricing data. This requirement shall apply only to negotiated subcontracts in excess of \$100,000

where the price negotiated is not based on:

(i) established catalog or market prices of commercial items sold in substantial quantities to the general public, or

(ii) prices set by law or regulation and except that the requirement shall not apply to negotiated subcontracts otherwise exempt from the requirement to accept the Cost Accounting Standards clause by reason of Section 331.30(b) of Title 4 Code of Federal Regulations (4 CFR 331.30(b)).

Note: (1) Subcontractors shall be required to submit their Disclosure Statements to the Contractor. However, if a subcontractor has previously submitted his Disclosure Statement to a Government Administrative Contracting Officer (ACO) he may satisfy that requirement by certifying to the Contractor the date of such Statement and the address of the ACO.

Note: (2) In any case where a Subcontractor determines that the Disclosure Statement information is privileged and confidential and declines to provide it to his Contractor or higher tier subcontractor the Contractor may authorize direct submission of that subcontractor's Disclosure Statement to the same Government offices to which the Contractor was required to make submission of his Disclosure Statement. Such authorization shall in no way relieve the Contractor of liability as provided in paragraph (a)(5) of this clause. In view of the foregoing and since the contract may be subject to adjustment under this clause by reason of any failure to comply with rules, regulations, and Standards of the Cost Accounting Standards Board in connection with covered subcontracts, it is expected that the Contractor may wish to include a clause in each such

subcontract requiring the subcontractor to appropriately indemnify the Contractor. However, the inclusion of such a clause and the terms thereof are matters for negotiation and agreement between the Contractor and the subcontractor, provided that they do not conflict with the duties of the Contractor under its contract with the Government. It is also expected that any subcontractor subject to such indemnification will generally require substantially similar indemnification to be submitted by his subcontractors.

Note: (3) If the Subcontractor is a business unit which, pursuant to 4 CFR 332 is entitled to elect modified contract coverage and to follow Standards 401 and 402 only, the clause entitled "Disclosure and Consistency of Cost Accounting Practices" set forth in DAR 7-104.83(a)(2) shall be inserted in lieu of this clause.

(e) The terms defined in Section 331.20 of Part 331 of Title 4, Code of Federal Regulations (4 CFR 331.20) shall have the same meanings herein. As there defined, "negotiated subcontract" means "any subcontract except a firm fixed-price subcontract made by a Contractor or subcontractor after receiving offers from at least two firms not associated with each other or such Contractor or Subcontractor, providing (1) the solicitation to all competing firms is identical, (2) price is the only consideration in selecting the Subcontractor from among the competing firms solicited, and (3) the lowest offer received in compliance with the solicitation from among those solicited is accepted." (DAR 7-104.83)

97. AFFIRMATIVE ACTION COMPLIANCE  
REQUIREMENTS FOR CONSTRUCTION  
(1978 SEP)

(a) As used in this clause:

(1) "Covered area" means the geographical area described in the solicitation from which this contract resulted;

(2) "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;

(3) "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

(4) "Minority" includes:

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

(ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);

(iii) 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); and

(iv) 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).

(b) Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of this clause and the Notice which contains the applicable goals for minority and female participation and which is

set forth in the solicitation from which this contract resulted.

(c) If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO 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 covered Contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals.

(d) The Contractor shall implement the specific affirmative action standards provided in subparagraph (g)(1) through (16) of this clause. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization 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 (whether or not it is Federal or Federally assisted) in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where such work is actually performed. The Contractor is expected to make substantially uniform progress toward its goals in each craft.

(e) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under this clause, Executive Order 11246, or the regulations promulgated pursuant thereto.

(f) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such 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 specific affirmative actions 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 shall implement affirmative action steps at least as extensive as the following:

(1) Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site 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 such sites or in such facilities.

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

(3) Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

(4) Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person 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 which 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 (g)(2) above.

(6) Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

(7) Review, at least annually, the company's EEO policy and affirmative action obligations under this clause with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with onsite supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any 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 EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy

with other Contractors and subcontractors with whom the Contractor does or anticipates doing business.

(9) Direct its 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 one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall 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 other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.

(11) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

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

(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 EEO policy and

the Contractor's obligations under this clause are being carried out.

(14) Ensure that all facilities and company activities are non-segregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

(15) Document and maintain a record of all solicitations of offers for subcontracts from 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 EEO policies and affirmative action obligations.

(h) Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations ((g)(1) through (16)). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under (g)(1) through (16) of this clause provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals, and can provide access to documentation which demonstrates the effectiveness of

actions taken on behalf of the Contractor. The obligation to comply, however, 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 have been established. The Contractor, however, 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 non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

(j) The Contractor shall not use the 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 pursuant to Executive Order 11246.

(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 pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties

shall be in violation of this clause and Executive Order 11246, as amended.

(m) The Contractor, in fulfilling its obligations under this clause shall implement specific affirmative action steps, at least as extensive as those standards 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 the Executive Order, the implementing regulations, or this clause, the Director shall proceed in accordance with 41 CFR 60-4.8.

(n) The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, 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, contractors shall not be required to maintain separate records.

(o) Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of 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).

#### 98. AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS (1976 MAY)

(a) The contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant for employment is qualified. The contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap in all employment practices such as the following: employment, upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

(b) The contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.

(c) In the event of the contractor's noncompliance with the requirements of this clause, action for noncompliance may be taken in accordance with the rules, regulations and relevant orders of the Secretary of Labor issued pursuant to the Act.

(d) The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, provided by or through the Contracting Officer. Such notices shall state the contractor's obligation under the law to take affirmative action to employ and advance in employment qualified handicapped employees and applicants for

employment, and the rights of applicants and employees.

(e) The contractor will 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 Rehabilitation Act of 1973, and is committed to take affirmative action to employ and advance in employment physically and mentally handicapped individuals.

(f) The contractor will include the provisions of this clause in every subcontract or purchase order of \$2,500 or more unless exempted by rules, regulations, or orders of the Secretary issued pursuant to section 503 of the Act, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the Director of the Office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance. (DAR 7-103.28)

#### 99. CLEAN AIR AND WATER (1975 OCT)

(Applicable only if the contract exceeds \$100,000, or the Contracting Officer has determined that orders under an indefinite quantity contract in any one year will exceed \$100,000, or a facility to be used has been the subject of a conviction under the Clean Air Act (42 U.S.C. 1857c-8c(1)) or the Federal Water Pollution Control Act (33 U.S.C. 1319(c)) and is listed by EPA, or the contract is not otherwise exempt.)

(a) The Contractor agrees as follows:

(i) to comply with all the requirements of section 114 of the

Clean Air Act, as amended (42 U.S.C. 1857, et seq., as amended by Public Law 91-604) and section 308 of the Federal Water Pollution Control Act (33 U.S.C. 1251, as amended by Public Law 92-500), respectively, relating to inspection, monitoring, entry, reports, and information, as well as other requirements specified in section 114 and section 308 of the Air Act and the Water Act, respectively, and all regulations and guidelines issued thereunder before the award of this contract;

(ii) that no portion of the work required by this prime contract will be performed in a facility listed on the Environmental Protection Agency List of Violating Facilities on the date this contract was awarded unless and until the EPA eliminates the name of such facility or facilities from such listing;

(iii) to use his best efforts to comply with clean air standards and clean water standards at the facilities in which the contract is being performed; and

(iv) to insert the substance of the provisions of this clause in any nonexempt subcontract, including this paragraph (iv).

(b) The terms used in this clause have the following meanings.

(1) The term "Air Act" means the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Public Law 91-604).

(2) The term "Water Act" means Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Public Law 92-500).

(3) The term "clean air standards" means any enforceable rules,

regulations, guidelines, standards, limitations, orders, controls, prohibitions, or other requirements which are contained in, issued under, or otherwise adopted pursuant to the Air Act or Executive Order 11738, an applicable implementation plan as described in section 110(d) of the Clean Air Act (42 U.S.C. 1857c-5(d)), an approved implementation procedure or plan under section 111(c) or section 111(d), respectively, of the Air Act (42 U.S.C. 1857c-6(c) or (d)), or an approved implementation procedure under section 112(d) of the Air Act (42 U.S.C. 1857c-7(d)).

(4) The term "clean water standards" means any enforceable limitation, control, condition, prohibition, standard or other requirement which is promulgated pursuant to the Water Act or contained in a permit issued to a discharger by the Environmental Protection Agency or by a State under an approved program, as authorized by section 402 of the Water Act (33 U.S.C. 1342), or by a local government to ensure compliance with pretreatment regulations as required by section 307 of the Water Act (33 U.S.C. 1317).

(5) The term "compliance" means compliance with clean air or water standards. Compliance shall also mean compliance with a schedule or plan ordered or approved by a court of competent jurisdiction, the Environmental Protection Agency or an air or water pollution control agency in accordance with the requirement of the Air Act or Water Act and regulations issued pursuant thereto.

(6) The term "facility" means any building, plant, installation, structure, mine, vessel or other floating craft, location, or site of operations, owned, leased, or supervised by a contractor, subcontractor, to be utilized in the performance of a contract or subcontract. Where a location or site of operations contains or

includes more than one building, plant, installation, or structure, the entire location or site shall be deemed to be a facility except where the Director, Office of Federal Activities, Environmental Protection Agency, determines that independent facilities are collocated in one geographical area.

(7) The term "nonexempt contract or subcontract" means a contract or subcontract of more than \$100,000 which is not otherwise exempted pursuant to the EPA regulations implementing the Air Act and Water Act (40 CFR 15.5), as further implemented in DAR 1-2302.4 or in FPR 1-1.2302-4 (whichever is applicable) and the procedures of the Department awarding the contract. (DAR 7-103.29)

#### 100. EQUITABLE ADJUSTMENTS: WAIVER AND RELEASE OF CLAIMS (7-76)

(a) Whenever the contractor submits a claim for equitable adjustment under any clause of this contract which provides for equitable adjustment of the contract, such claim shall include all types of adjustments in the total amounts to which the clause entitles the contractor, including but not limited to adjustments arising out of delays or disruptions or both caused by such change. Except as the parties may otherwise expressly agree, the contractor shall be deemed to have waived (i) any adjustments to which it otherwise might be entitled under the clause where such claim fails to request such adjustments, and (ii) any increase in the amount of equitable adjustments additional to those requested in its claim.

(b) Further, the contractor agrees that, if required by the Contracting Officer, he will execute a release, in form and substance satisfactory to the Contracting Officer, as part of the supplemental agreement setting forth the aforesaid equitable adjustment, and that such release shall discharge the Government, its officers,

agents and employees, from any further claims, including but not limited to further claims arising out of delays or disruptions or both, caused by the aforesaid change.

101. AFFIRMATIVE ACTION FOR DISABLED VETERANS AND VETERANS OF THE VIETNAM ERA (1976 JUL)

(This clause is applicable pursuant to 41 C.F.R. 60-250, if this contract is for \$10,000 or more.)

(a) The contractor will not discriminate against any employee or applicant for employment because he or she is a disabled veteran or veteran of the Vietnam era in regard to any position for which the employee or applicant for employment is qualified. The contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified disabled veterans and veterans of the Vietnam era without discrimination based upon their disability of veterans status in all employment practices such as the following: employment upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

(b) The contractor agrees that all suitable employment openings of the contractor which 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 wherein the contract is being performed but excluding those of independently operated corporate affiliates, shall be listed at an appropriate local office of the State employment service system wherein the opening occurs. The contractor further agrees to provide such reports to such local office regarding employment openings and hires as may be required.

State and local government agencies holding Federal contracts of \$10,000 or more shall also list all their suitable openings with the appropriate office of the State employment service, but are not required to provide those reports set forth in paragraphs (d) and (e).

(c) Listing of employment openings with the employment service system pursuant to this clause shall be made at least concurrently with the use of any other recruitment source or effort and shall involve the normal obligations which attach to the placing of a bona fide job order, including the acceptance of referrals of veterans and nonveterans. The listing of employment openings does not require the hiring of any particular job applicant or from any particular group of job applicants, and nothing herein is intended to relieve the contractor from any requirements in Executive Orders or regulations regarding nondiscrimination in employment.

(d) The reports required by paragraph (b) of this clause shall include, but not be limited to, periodic reports which shall be filed at least quarterly with the appropriate local office or, where the contractor has more than one hiring location in a State, with the central office of that State employment service. Such reports shall indicate for each hiring location (1) the number of individuals hired during the reporting period, (2) the number of nondisabled veterans of the Vietnam era hired, (3) the number of disabled veterans of the Vietnam era hired, and (4) the total number of disabled veterans hired. The reports should include covered veterans hired for on-the-job training under 38 USC 1787. The contractor shall submit a report within 30 days after the end of each reporting period wherein any performance is made on this contract identifying data for each hiring location. The contractor shall maintain at each hiring location copies of the reports submitted

until the expiration of one year after final payment under the contract, during which time these reports and related documentation shall be made available, upon request, for examination by any authorized representatives of the Contracting Officer or of the Secretary of Labor. Documentation would include personnel records respecting job openings, recruitment and placement.

(e) Whenever the contractor becomes contractually bound to the listing provisions of this clause, it shall advise the employment service system 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 provisions and has so advised the State system, there is no need to advise the State system of subsequent contracts. The contractor may advise the State system when it is no longer bound by this contract clause.

(f) This clause does not apply to the listing of employment openings which occur and are filled outside of the 50 States, the District of Columbia, Puerto Rico, Guam, and the Virgin Islands.

(g) The provisions of paragraphs (b), (c), (d) and (e) of this clause do not apply to openings which the contractor proposes to fill from within his own organization or to fill pursuant to a customary and traditional employer-union hiring arrangement. This exclusion does not apply to a particular opening once an employer decides to consider applicants outside of his own organization or employer-union arrangement for that opening.

(h) As used in this clause:

(1) "All suitable employment openings" includes, but is not limited to, openings which occur in the following job categories: production and

nonproduction; plant and office; laborers and mechanics; supervisory and non-supervisory; technical; and executive, administrative, and professional openings as are compensated on a salary basis of less than \$25,000 per year. This term includes full-time employment, temporary employment of more than 3 days' duration, and part-time employment. It does not include openings which the contractor proposes to fill from within his own organization or to fill pursuant to a customary and traditional employer-union hiring arrangement nor openings in an educational institution which are restricted to students of that institution. Under the most compelling circumstances an employment opening may not be suitable for listing, including such situations where the needs of the Government cannot reasonably be otherwise supplied, where listing would be contrary to national security, or where the requirement of listing would otherwise not be for the best interest of the Government.

(2) "Appropriate office of the State employment service system" means the local office of the Federal-State national system of public employment offices with assigned responsibility for serving the area where the employment opening is to be filled, including the District of Columbia, Guam, Puerto Rico, and the Virgin Islands.

(3) "Openings which the contractor proposes to fill from within his own organization" means employment openings for which no consideration will be given to persons outside the contractor's organization (including any affiliates, subsidiaries, and the parent companies) and includes any openings which the contractor proposes to fill from regularly established "recall" lists.

(4) "Openings which the contractor proposes to fill pursuant to a customary and traditional employer-union hiring arrangement" means employ-

ment openings which the contractor proposes to fill from union halls, which is part of the customary and traditional hiring relationship which exists between the contractor and representatives of his employees.

(i) The contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Vietnam Veterans Readjustment Act, hereinafter referred to as the "Act" (38 U.S.C. 2012).

(j) In the event of the contractor's noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.

(k) The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, Office of Federal Contract Compliance Programs, provided by or through the Contracting Officer. Such notice shall state the contractor's obligation under the law to take affirmative action to employ and advance in employment qualified disabled veterans and veterans of the Vietnam era for employment, and the rights of applicants and employees.

(l) The contractor will 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 Vietnam Era Veterans Readjustment Assistance Act, and is committed to take affirmative action to employ and advance in employment qualified disabled veterans and veterans of the Vietnam Era.

(m) The contractor will include the provisions of this clause in every subcontract or purchase order of \$10,000 or more unless exempted by

rules, regulations, or orders of the Secretary issued pursuant to the Act, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Director of the Office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance. (DAR 7-103.27)

#### 102. ADMINISTRATION OF COST ACCOUNTING STANDARDS (1978 MAY)

For the purpose of administering Cost Accounting Standards requirements under this contract, the Contractor shall:

(a) Submit to the cognizant Contracting Officer a description of the accounting change and the general dollar magnitude of the change to reflect the sum of all increases and the sum of all decreases for all contracts containing the Cost Accounting Standards clause (7-104.83(a)(1) or the Disclosure and Consistency of Cost Accounting Practices clause (7-104.83(a)(2)):

(i) for any change in cost accounting practices required to comply with a new cost accounting standard in accordance with paragraph (a)(3) and (a)(4)(A) of the clause entitled "Cost Accounting Standards" within sixty (60) days (or such other date as may be mutually agreed to) after award of a contract requiring such change:

(ii) for any change to cost accounting practices proposed in accordance with paragraph (a)(4)(B) or (a)(4)(C) of the clause entitled "Cost Accounting Standards" or with paragraphs (a)(3) or (a)(5) of the clause entitled "Disclosure and Consistency of Cost Accounting Practices" not less than sixty (60) days (or such other date as may be mutually agreed to) prior to the effective date of the proposed change; or

(iii) for any failure to comply with an applicable Cost Accounting Standard or to follow a disclosed practice as contemplated by paragraph (a) (5) of the clause entitled "Cost Accounting Standards" or with paragraph (a)(4) of the clause entitled "Disclosure and Consistency of Cost Accounting Practices" within sixty (60) days (or such other date as may be mutually agreed to) after the date of agreement of such noncompliance by the Contractor.

(b) Submit a cost impact proposal in the form and manner specified by the cognizant Contracting Officer within sixty (60) days (or such other date as may be mutually agreed to) after the date of determination of the adequacy and compliance of a change submitted pursuant to (a)(i), (ii), or (iii) above.

(c) Agree to appropriate contract and subcontract amendments to reflect adjustments established in accordance with paragraphs (a)(4) and (a)(5) of the clause entitled "Cost Accounting Standards" or with paragraphs (a)(3), (a)(4), and (a)(5) of the clause entitled "Disclosure and Consistency of Cost Accounting Practices."

(d) When the subcontract is subject to either the clause entitled "Cost Accounting Standards" or the clause entitled "Disclosure and Consistency of Cost Accounting Practices" so state in the body of the subcontract and/or in the letter of award. Self-deleting clauses shall not be used.

(e) Include the substance of this clause in all negotiated subcontracts containing either the clause entitled "Cost Accounting Standards" or the clause entitled "Disclosure and Consistency of Cost Accounting Practices." In addition within thirty (30) days after award of such subcontract submit the following information to the Contractor's cognizant Contract Administration Office for transmittal to the

Contract Administration Office cognizant of the subcontractor's facility.

(1) Subcontractor's name and subcontract number.

(2) Dollar amount and date of award.

(3) Name of Contractor making the award.

(4) A statement as to whether the subcontractor has made or proposes to make any changes to accounting practices that affect prime contracts or subcontracts containing the Cost Accounting Standards clause or Disclosure and Consistency of Cost Accounting Practices clause because of the award of this subcontract unless such changes have already been reported. If award of the subcontract results in making a Cost Accounting Standard(s) effective for the first time, this shall also be reported.

(f) For negotiated subcontracts containing the clause entitled "Cost Accounting Standards", require the subcontractor to comply with all standards in effect on the date of final agreement on price as shown on the subcontractor's signed certificate of current cost or pricing data or date of award whichever is earlier.

(g) In the event an adjustment is required to be made to any subcontract hereunder, notify the Contracting Officer in writing of such adjustment and agree to an adjustment in the price or estimated cost and fee of this contract, as appropriate, based upon the adjustment established under the subcontract. Such notice shall be given within thirty (30) days after receipt of the proposed subcontract adjustment, or such other date as may be mutually agreed to, and shall include a proposal for adjustment to such higher tier subcontract or prime contract as appropriate.

(h) When either the Cost Accounting Standards clause or the Disclosure and Consistency of Cost Accounting Practices clause and this clause are included in subcontracts, the term "Contracting Officer" shall be suitably altered to identify the purchaser.

### 103. OVERSEAS DISTRIBUTION OF DEFENSE SUBCONTRACTS:

(This paragraph shall apply only if the contract price exceeds \$500,000, or if any modification increases the amount of the contract to more than \$500,000. In the latter case, the reporting requirement will not be retroactive so as to require the reporting of subcontracts awarded prior to such a modification.)

(a) For each subcontract or modification thereof which exceeds \$10,000 where the principal place of performance is outside the United States or its territories and possessions, the contractor agrees to furnish the information listed below on a quarterly basis to the Director for Information, Operations and Reports, Washington Headquarters Services, Department of Defense, Washington, D.C. 20301:

- (i) Name and address of prime contractor (or subcontractor required to report)
- (ii) Prime contract number
- (iii) Name and address of overseas subcontractor (this data item is important for discussion of trade balances with other countries but submission of this information is not mandatory)
- (iv) Subcontract number (including modification number) being reported

(v) Dollar amount of this action (enclose commitments in parenthesis)

(vi) Principal place of subcontract performance

(vii) Type of supply or service

(b) The required information, if any, shall be as of the last day of the calendar year quarter and submitted within 10 days of the end of each quarter.

(c) The prime contractor agrees to insert a provision substantially similar to this in all first tier subcontracts over \$100,000 except subcontracts for ores, natural gas, utilities, petroleum products and crudes, timber (logs) and subsistence. The prime contractor shall also identify the applicable prime contract number to the subcontractor for reporting purposes.

### 104. EMPLOYMENT OF OCEAN-GOING VESSELS BY CONSTRUCTION CONTRACTORS (1979 JUN)

(a) If ocean transportation is required after the date of award of this contract to bring any supplies, materials, or equipment, to the construction site from the United States either for use in performance of or for incorporation in the work called for by this contract, United States-flag vessels shall be employed in such transportation to the extent such vessels are available at fair and reasonable rates for United States-flag vessels. The Contractor shall not make any shipment exceeding ten measurement tons (400 cubic feet) by other than a United States-flag vessel without notifying the Contracting Officer that United States-flag vessels are not available at fair and reasonable rates for such vessels and obtaining his permission to ship in other vessels. If such permission is granted, the contract price

shall be equitably adjusted to reflect the difference in cost.

(b) The Contractor shall include the substance of this clause, including this paragraph (b), in each subcontract or purchase order hereunder which may involve the ocean transportation of construction supplies, materials, or equipment from the United States.

(c) Promptly after each shipment the contractor shall furnish to the U.S. Maritimes Administration, Division of National Cargo, 14th and E. Streets, N.W., Washington, D.C. 20230, one copy of the applicable ocean shipping document indicating for each shipment made under this contract the name and nationality of the vessel and the measurement tonnage (400 cubic feet) shipped on such vessel.

105. CERTIFICATION OF REQUESTS FOR ADJUSTMENT OR RELIEF EXCEEDING \$100,000 (1980 FEB)

(a) Any contract claim, request for equitable adjustment to contract terms, request for relief under Public Law 85-804, or other similar request exceeding \$100,000 shall bear, at the time of submission, the following certificate given by a senior company official in charge at the plant or location involved:

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; and that the amount requested accurately reflects the contract adjustment for which the Contractor believes the Government is liable.

\_\_\_\_\_  
(Official's Name)

\_\_\_\_\_  
(Title)

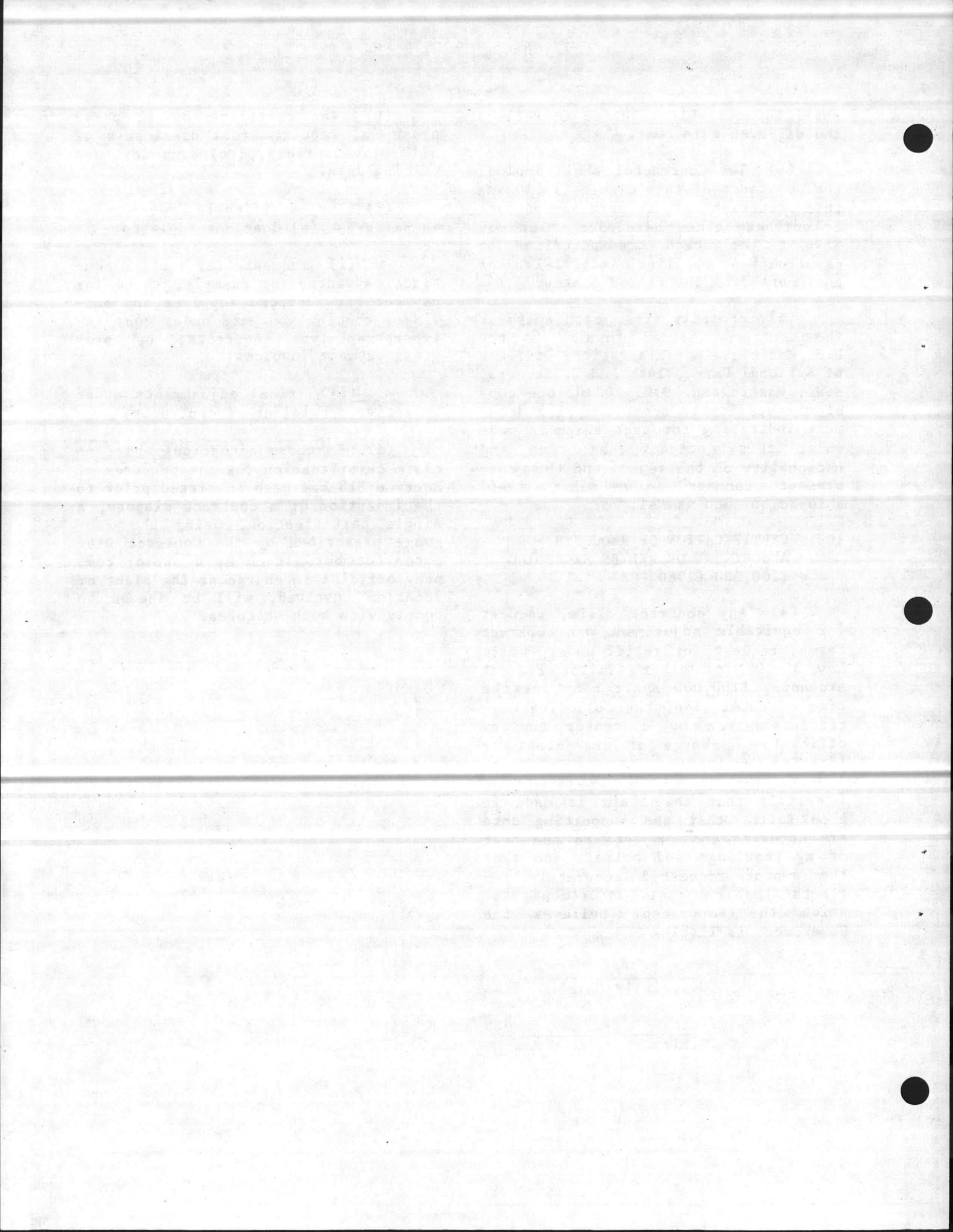
(b) The certification in paragraph (a) requires full disclosure of all relevant facts, including cost and pricing data.

(c) The certification requirement in paragraph (a) does not apply to:

(i) requests for routine contract payments--for example, those for payment for accepted supplies and services, routine vouchers under cost reimbursement-type contracts, and progress payment invoices;

(ii) final adjustments under incentive provisions of contracts;

(d) In those situations where no claim certification for the purposes of Section 813 has been submitted prior to the inception of a contract dispute, a single certification, using the language prescribed by the Contract Disputes Act but signed by a senior company official in charge at the plant or location involved, will be deemed to comply with both statutes.



DEPARTMENT OF THE NAVY  
ATLANTIC DIVISION, NAVAL FACILITIES ENGINEERING COMMAND  
NAVAL STATION, NORFOLK, VIRGINIA

NOTICE:

N62470-80-B-0399

Bids to be opened at 2:00 p.m.

NAVFAC  
SPECIFICATION  
NO. 05-80-0399

13 JULY 1982

at the Atlantic Division  
Naval Facilities Engineering Command  
Naval Station, Norfolk, Virginia 23511

Appropriation: O&MMC

REPLACE WATER WELLS

AT THE

MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA

DESIGN BY:

PEIRSON & WHITMAN, INC.  
RALEIGH, NORTH CAROLINA

SPECIFICATION PREPARED BY:

CIVIL: Henry M. Webster, P.E.

MECHANICAL: Sam Wilkinson, P.E.

STRUCTURAL: Grover L. Sawyer, P.E.

ELECTRICAL: Merlin Adams, P.E.

SUBMITTED BY: Henry M. Webster, P.E. DATE: 29 April 1982

SPECIFICATION APPROVED BY:

*CRR*  
Specification Branch Head: C. R. Rose, P.E.  
Design Director: J. M. Davis, P.E.  
For EFD For Commander, NAVFAC: *J. M. Davis*  
Date: 2 June 1982

05-80-0399

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## SECTION 01011

### GENERAL PARAGRAPHS

1. GENERAL INTENTION: It is the declared and acknowledged intention and meaning to provide and secure water wells complete and ready for use.

2. GENERAL DESCRIPTION: The work includes the provision of eight unconsolidated water wells including well, well house, mechanical equipment, electrical equipment and demolition of eight existing wells and well houses and incidental related work.

3. LOCATION: The work shall be located at the Marine Corps Base, Camp Lejeune, North Carolina, approximately as shown. The exact location will be indicated by the Contracting Officer.

4. COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK: The Contractor will be required to commence work under the contract 15 calendar days after the date of "Notice of Award", to prosecute said work diligently, and to complete the entire work ready for use within 360 calendar days. The time stated for completion shall include final cleanup of the premises. The contract completion shall include final cleanup of the premises. The contract completion date will be computed starting 15 calendar days after the date of the Notice of Award. This 15 day period is to allow for mailing of the Notice of Award and the Contractor's submission of required bonds.

5. LIQUIDATED DAMAGES: In case of failure on the part of the Contractor to complete the work within the time fixed in the contract or any extensions thereof, the Contractor shall pay to the Government as liquidated damages pursuant to Clause entitled, "Termination for Default - Damages for Delay - Time Extensions," and Clause entitled, "Damages for Delay - Defense Materials System and Priorities" of the General Provisions the sum of \$75.00 for each day of delay.

6. DRAWINGS ACCOMPANYING SPECIFICATION: The following drawings accompany this specification and are a part thereof. Drawings are the property of the Government and shall not be used for any purpose other than that contemplated by the specification. The drawings included with this specification are half-size. Full-size drawings are available at the bidder's or Contractor's expense. Information on procuring these full-size drawings may be obtained from the Contracting Officer. Full-size drawings may be inspected during regular working hours at the office of the Contracting Officer.

EFD DWG. NO.	NAVFAC DWG. NO.	TITLE
164850	4064850	Site Location
164851	4064851	Well House 611 & 614 Site Plan
164852	4064852	Well House 627 & 639 Site Plan
164853	4064853	Well House RR227 & 638 Site Plan
164854	4064854	Well House LCH 4006 & 621 Site Plan
164855	4064855	Piping & Foundation Details
164856	4064856	Well House & Piping Details
164857	4064857	Floor Plan, Sections & Details
164858	4064858	Electrical Details

7. SPECIFICATIONS AND PRINTS FURNISHED TO CONTRACTOR: Five copies of the project specification, five sets of one-half prints, and one set of full-size reproducibles of each drawing accompanying this specification will be furnished the Contractor without charge. Additional prints required by the Contractor shall be reproduced by him at his own expense.

8. SCHEDULE OF PRICES: A schedule of prices shall be furnished in accordance with Clause entitled, "Schedule of Prices" of the General Provisions. The original and seven copies of the schedule of prices shall be submitted to the Contracting Officer, via the Resident Officer in Charge of Construction, for approval in accordance with Clause entitled, "Schedule of Prices" of the General Provisions. Pursuant to Clause entitled "Payments to Contractor" of the General Provisions, payments will not be made until the schedule of prices has been submitted and approved.

9. CONTRACTOR'S INVOICE AND CONTRACT PERFORMANCE STATEMENT: Requests for payment in accordance with the terms of the contract shall consist of:

(a) Contractor's Invoice on form NAVFAC 10-7300/30 (4/68), which shall show, in summary form, the basis for arriving at the amount of the invoice.

(b) Contract Performance Statement on form NAVFAC 10-7300/31 required by Clause entitled "Contractor's Invoice and Contract Performance Statement" of the General Provisions is deleted.

(c) Contractor's Monthly Estimate for Voucher.

(d) Affidavit to accompany invoice (5ND LANTDIV form 4-4235/4 (Rev. 1/68)).

(e) Updated copy of progress schedule. (See Clause entitled "Progress Charts and Requirements for Overtime Work" of the General Provisions.)

Forms will be furnished by the Contracting Officer. (The Contractor has the option to use the government furnished progress schedule and record form.) Monthly invoices and supporting forms for work performed through the 20th of the month shall be submitted to the Contracting Officer by the 25th of the month in the following quantities.

- (a) Contractor's Invoice (NAVFAC 10-7300/30) - Original and five copies
- (b) Contractor's Monthly Estimate for Voucher (5ND GEN 4265/1) Original and two copies shall be required on all jobs where there is a schedule of prices
- (c) Affidavit (LANTDIV 4-4235/4) - Original
- (d) Progress Schedule - Two copies

10. MATERIALS AND EQUIPMENT TO BE SALVAGED: Clause entitled "Salvage Materials and Equipment" of the General Provisions is hereby deleted. Except where specifically specified otherwise herein, all existing materials and equipment which are required to be removed or disconnected to perform the work, but are not indicated or specified for use in the new work, shall become the property of the Contractor and shall be removed from Government property.

11. AVAILABILITY OF UTILITIES SERVICES: Clause entitled "Availability and Use of Utility Services" of the General Provisions applies. Reasonable amounts of utilities will be made available to the Contractor at the prevailing Government rates, which may be obtained upon application to the Commanding Officer, by way of the Resident Officer in Charge of Construction. The Contractor will be responsible for making connections, providing transformers and meters, and making disconnections; and for providing backflow preventer devices on connections to domestic water lines.

12. AS-BUILT RECORD OF MATERIALS USED IN BUILDINGS: A record of materials used, in accordance with Clause entitled "As-Built Record of Materials Used in Buildings" of the General Provisions is not required.

13. TRAILERS OR STORAGE BUILDINGS: In accordance with Clause entitled "Operations and Storage Areas" of the General Provisions, trailers or storage buildings will be permitted on the job site, where space is available, subject to the approval of the Contracting Officer. The trailers or buildings shall be suitably painted and kept in a good state of repair. Failure of the Contractor to maintain his trailers or storage buildings in good condition will be considered sufficient reason to require their removal from the job site.

14. WRITTEN GUARANTEES AND GUARANTOR'S LOCAL REPRESENTATIVE: Prior to completion of the contract, the Contractor shall obtain and furnish to the Contracting Officer's designated representative written guarantees for all the equipment and appliances furnished under the contract. The Contractor shall furnish with each guarantee: The name, address, and telephone number of the guarantor's representative nearest to the location where the equipment and appliances

are installed, who, upon request of the Using Service's representative, will honor the guarantee during the guaranty period and will provide the services prescribed by the terms of the guarantee. At the time of installation, the Contractor shall tag each item of warranted equipment with a durable, oil and water resistant tag approved by the Contracting Officer. Tag shall be attached with copper wire and sprayed with a clear silicone waterproof coating. Leave the date of acceptance and inspector's signature blank until project is accepted for beneficial occupancy. Tag shall show the following information:

EQUIPMENT WARRANTY TAG

Type of Equipment .....  
 Accepted Date.....  
 Warranted Until.....  
 Under Contract N62470-.....  
 Inspector's Signature.....

STATION PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE

15. SAFETY PROGRAM: The Contractor shall implement a safety program conforming to the requirements of Federal, State and Local laws, rules and regulations. The program shall include, but is not limited to, the following:

a. "Occupational Safety and Health Standards", which can be ordered from the Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.

b. Department of the Army, Corps of Engineers, "General Safety Requirements", which may be examined in the office where bids are being received or may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

16. EMERGENCY MEDICAL CARE: Emergency medical care only is available at Government facilities at Marine Corps Base, Camp Lejeune for Contractor employees who suffer on-the-job injury or disease. Emergency care will be rendered at the prevailing rates established in BUMEDINST 6320.4 series. Reimbursement will be made by the Contractor to the Naval Regional Medical Center Collection Agent upon receipt of a monthly statement.

17. PROPRIETARY NAMES: Names indicated for colors, textures and patterns of materials are for the purpose of color, texture and pattern selection only. Other manufacturers materials are acceptable provided they closely approximate colors, textures and patterns indicated and provided they conform to all other requirements.

18. SCHEDULING THE WORK:

18.1 General Scheduling Requirements: Notwithstanding the requirements of Clause entitled "Progress Charts and Requirements for Overtime Work" of the General Provisions, immediately after award the Contractor shall meet with the Contracting Officer and present a schedule

of work, prepared in accordance with said Clause, for review by the Contracting Officer. The schedule will be reviewed at this meeting and will be retained by the Contracting Officer for final review and approval. The normal working hours are 8:30 a.m. to 4:30 p.m. Monday through Friday.

#### 18.2 Special Scheduling Requirements:

18.2.1 Permission to interrupt any utility service shall be requested in writing at least fifteen days in advance and approval of the Contracting Officer shall be received before any service is interrupted. Interruptions of utility services will be allowed only when they will cause no interference with the operations of the activity. All utility cutovers shall be made after normal working hours or on weekends; anticipated costs shall be included in the bid.

19. FORWARDING OF SAMPLES AND SUBMITTALS: Notwithstanding the requirements of Clause entitled "Shop Drawings" of the General Provisions, the quantity of submittals required shall be as specified hereinafter.

19.1 Samples Required of the Contractor: As soon as practicable, and before installation, submit to the Architect-Engineer: Peirson & Whitman, Inc., P. O. Box 30458, Raleigh, N. C. 27622, for approval, samples of materials and equipment as may be requested, including all samples required in the technical sections of this specification.

19.2 Shop Drawings, Manufacturers Data and Certifications Required of the Contractor: As soon as practicable after award of the contract, and before procurement or fabrication, submit, except as specified otherwise, to the Architect-Engineer: Peirson & Whitman, Inc., P. O. Box 30458, Raleigh, N.C. 27622, all the shop drawings, manufacturers data and certifications required in the technical sections of this specification. The Architect-Engineer for this project will review and approve for the Contracting Officer if the submittal complies with the contract requirements. One copy of the transmittal for for all submittals shall be forwarded to the Resident Officer in Charge of Construction. Specification MIL-D-1000 shall be used as a guide and its use is encouraged for all drawings and data submitted by the Contractor. Conformance to the provisions of specification MIL-D-1000 is not mandatory for maps, sketches, presentation drawings, perspectives, renderings, and all other drawings not requiring Naval Facilities Engineering Command drawing numbers.

20. QUARANTINE FOR IMPORTED FIRE ANT (7/76). All of Onslow, Jones and Cartaret Counties and portions of Duplin and Craven Counties have been declared a generally infested area by the United States Department of Agriculture for the imported fire ant. Compliance with the quarantine regulations established by this authority as set forth in USDA Quarantine No. 81 dated 9 October 1970, and USDA Publication 301.81-2A of 23 July 1976, is required for operations hereunder. Pertinent requirements of the quarantine for materials, originating on the Camp Lejeune reservation, the Marine Corps Air Station (Helicopter), New River and the Marine Corps Air Station, Cherry Point, which are to be transported outside the Onslow County or adjacent suppression areas, include the following:

(a) Certification is required for the following articles, and they shall not be moved from the reservation to any point outside the Onslow County and adjacent designated areas unless accompanied by a valid inspection certificate issued by an Officer of the Plant Protection and Quarantine Program of the U.S. Department of Agriculture.

(1) Bulk soil.

(2) Used mechanized soil-moving equipment.

NOTE: Used mechanized soil-moving equipment is exempt if cleaned of all loose noncompacted soil.

(3) Any other products, articles, or means of conveyances, if it is determined by an inspector that they present a hazard of spread of the imported fire ant and the person in possession thereof has been so notified.

(b) Authorization for movement of equipment outside the imported fire ant regulated area shall be obtained from USDA, APHIS, PPQ, Rural Route 6, Box 53D, Wilmington, NC 28405, Telephone (919) 343-4667, and requests for inspection shall be made sufficiently in advance of the date of movement to permit arrangements for the services of authorized inspectors. The equipment shall be prepared and assembled so that it may be readily inspected. All soil on or attached to equipment, supplies and materials shall be removed by washing with water and/or such other means as necessary to accomplish complete removal. Resulting spoil shall be wasted as necessary and as directed.

END OF SECTION

SECTION 01012

ADDITIONAL GENERAL PARAGRAPHS

1. APPROVAL OF SAMPLES, CUTS, AND DRAWINGS: Matter submitted for approval shall be accompanied by complete information concerning the material, articles, and/or design proposed for use in sufficient detail to show compliance with the specification, and shall be approved before incorporation into the work. Approval thereof will not be construed as relieving the Contractor of compliance with the specification, even if such approval is made in writing, unless the attention of the Contracting Officer is called to the noncomplying features by letter accompanying the submitted matter. Partial submittals or submittals of less than the whole of any system made up of interdependent components, will not be considered. Approval of drawings, cuts, and samples by the Contracting Officer shall not be construed as a complete check or approval of the detailed dimensions, weights, gauges and similar details of the proposed articles. The conformance of such details with the contract requirements, together with the necessary coordination of dimensions and details between the various elements of the work and between the various subcontractors and suppliers, shall be solely the responsibility of the Contractor, approval of submitted matter notwithstanding.

2. OPERATION OF STATION UTILITIES: The Contractor shall not operate nor disturb the setting of any control devices in the station utilities system, including water, sewer, electrical and steam services. The Government will operate the control devices as required for normal conduct of the work. The Contractor shall notify the Contracting Officer giving reasonable advance notice when such operation is required.

3. CHANGED CONDITIONS: Wherever changed conditions as defined in Clause 4 of the General Provisions are encountered, and wherever conditions exposed during the course of the work necessitate a change from quantities indicated or specified as either estimated quantities or as a basis for bids, whether or not provision for a change in price for such variation is specified, the Contracting Officer must be notified in writing and written directions to do so must be obtained before quantities stated in the contract documents are exceeded.

4. SUBCONTRACTORS AND PERSONNEL: Promptly after the award of the contract, the Contractor shall submit to the Contracting Officer, in triplicate, a list of his subcontractors and the work each is to perform. On this form shall appear the names of the key personnel of the Contractor and subcontractors, together with their home addresses and telephone numbers, for use in event of any emergency. From time to time as changes occur and additional information becomes available, the Contractor shall amplify, correct, and change the information contained in previous lists.

(7/81)

5. AS-BUILT DRAWINGS: During the progress of the work one full-size print of each of the drawings accompanying this specification shall be neatly and clearly marked in red to show all variations between the construction actually provided and that indicated or specified in the contract documents. The as-built drawings shall be kept up-to-date at the work site at all times during the contract, and shall be available for inspection by the Contracting Officer upon request. The Contractor shall also mark the drawings to indicate the exact location of any underground utility lines discovered in the course of the work. Where a choice of materials or methods, or both, is permitted herein, and where variations in the scope or character of the work indicated or specified are permitted either by award on bidding items specified for that purpose or by subsequent change to the contract, the as-built drawings shall define the construction actually provided. The representation of such variations shall conform to standard drafting practice and shall include such supplementary notes, legends, and details as may be necessary for legibility and clear portrayal of the as-built construction; the marked prints shall be subject to approval of the Contracting Officer before acceptance. Upon completion of the work, the completed as-built drawings shall be presented to the Contracting Officer.

6. LOCATION OF UNDERGROUND UTILITIES: Where existing piping, utilities, and underground obstructions of any type are indicated in locations to be traversed by new piping, ducts, and other work provided hereunder, and are not indicated or specified to be removed, the elevations of the existing utilities and obstructions shall be determined before the new work is laid closer than the nearest manhole or other structure at which an adjustment in grade could be made. For any additional work required by reason of conflict between the new and existing work, an adjustment in contract price will be made in accordance with Clause 4 of the General Provisions.

SECTION 01401

CONTRACTOR INSPECTION SYSTEM

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 the basic designation only.

1.1.1 American Society for Testing and Materials (ASTM) Publications:

- |           |   |
|-----------|---|
| D 3666-78 | Inspection and Testing Agencies for Bituminous Paving Materials                                       |
| D 3740-78 | Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Construction  |
| E 329-77  | Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction |
| E 543-76  | Nondestructive Testing Agencies, Rec. Practice for Determining the Qualifications of                  |
| E 548-79  | Testing and Inspection Agencies, Rec. Practices for Generic Criteria for Use in Evaluation of         |

1.2 QUALITY CONTROL: Quality Control of this contract will be administered under the General Provisions Clause entitled "Contractor Inspection System."

1.3 DEFINITIONS:

1.3.1 Factory Tests: Tests made on various products and component parts prior to shipment to the job site, including but not limited to such items as transformers, boilers, air conditioning equipment, electrical equipment, and precast concrete.

1.3.2 Field Tests: Tests or analyses made at, or in the vicinity of the job site in connection with the actual construction.

1.3.3 Product: The term "product" includes the plural thereof and means a type or a category of manufactured goods, constructions, installations, and natural and processed materials or those associated services whose characterization, classification, or functional performance determination is specified by standards.

1.3.4 Person: The term "person" means associations, companies, corporations, educational institutions, firms, government agencies at the Federal, State and local level, partnerships, and societies, as well as divisions thereof, and individuals.

1.3.5 Testing Laboratory: The term "testing laboratory" means any "person," as defined above, whose functions include testing, analyzing, or inspecting "products," as defined above, and/or evaluating the designs or specifications of such "products" according to the requirements of applicable standards.

1.3.6 Certified Test Reports: Test reports signed by an authorized official stating that tests were performed in accordance with the test method specified, that the results reported are accurate, and that items tested either meet or fail to meet the stated minimum requirements. These test reports include those performed by Factory Mutual, Underwriters Laboratories, Inc. and others.

1.3.7 Certified Inspection Reports: Reports signed by approved inspectors attesting that the items inspected meet the specification requirements other than any exception included in the report.

1.3.8 Manufacturer's Certificate of Conformance: A certificate signed by an authorized manufacturer's official attesting that the material or equipment delivered meets the specification requirements.

1.4 SUBMITTALS: Prepare in accordance with the General Provisions and submit for approval. Each submittal shall be accompanied with a cover letter signed by the Contractor. Clearly mark each item proposed to be incorporated into the contract and identify in the submittals, with cross-references to the contract drawings and specifications so as to identify clearly the use for which it is intended. Stamp each sheet of submittal with the Contractor's certification stamp. Data submitted in a bound volume or on one sheet printed on two sides, may be stamped on the front of the first sheet only. The Contractor's certification stamp shall be worded as follows:

"It is hereby certified that the (equipment) (material) shown and marked in this submittal is that proposed to be incorporated into Contract Number \_\_\_\_\_, is in compliance with the Contract drawings and specifications, can be installed in the allocated spaces, and is submitted for Government approval.

Certified by \_\_\_\_\_ Date \_\_\_\_\_"

The person signing the certification shall be one designated in writing by the Contractor as having that authority. The signature shall be in original ink. Stamped signatures are not acceptable.

1.4.1 Submittal Status Logs: Within 15 calendar days after receipt of the "Notice of Award" the Contractor shall submit to the Resident Officer in Charge of Construction a copy of a submittal status log listing all submittals required in this contract. The Contractor shall maintain at the job site the submittal status log showing the status of all submittals. A sample format of an acceptable log is attached at the end of this section. While the use of this sample format is not required, any other format must contain the same information as shown on the sample. The submittal status log shall be made available for review by the Contracting Officer at all times.

1.4.2 Shop Drawings: These submittals shall be in accordance with the requirements of the General Provisions Clause entitled "Shop Drawings."

1.4.3 Manufacturer's Data: Catalog cuts, technical data sheets, and descriptive literature, shall be in accordance with the General Provisions Clauses entitled "Catalog Data" and "Proposed Material Submittals Required of the Contractor."

1.4.4 Samples: Prepare and submit in accordance with the General Provisions Clause entitled "Samples."

1.4.5 Certified Test Reports: Before delivery of materials and equipment, four certified copies of the reports of all tests listed in the technical sections shall be submitted and approved. The testing shall have been performed in a laboratory meeting the requirements specified herein. The tests shall have been performed within 3 years of submittal of the reports for approval. Test reports shall be accompanied by the certificates from the manufacturer certifying that the material and equipment proposed to be supplied is of the same type, quality, manufacture, and make as that tested.

1.4.6 Manufacturer's Certificates of Conformance: Before delivery, manufacturer's certifications shall be furnished by the Contractor as required on items of materials and equipment indicated in the technical sections. Pre-printed certifications will not be acceptable. All certifications shall be in the original. The original of all manufacturer's certifications shall name the appropriate item of equipment or material, specification, standard, or other document specified as controlling the quality of that item and shall have attached thereto certified copies of test data upon which the certifications are based. All certificates shall be signed by the manufacturer's official authorized to sign certificates of conformance.

1.4.7 Laboratory Reports: Reports shall cite the contract requirements, the test or analysis procedures used, the actual test results, and include a statement that the item tested or analyzed conforms or fails to conform to the specification requirements. Each report shall be conspicuously stamped on the cover sheet in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements as the case may be. All test reports shall be signed by a

representative of the testing laboratory authorized to sign certified test reports. The Contractor shall arrange for immediate and direct delivery of the signed original of all reports, certifications, and other documentation to the Contracting Officer.

1.4.8 Tabulation of Tests: Prior to final payment the Contractor shall obtain from each laboratory a tabulation of all tests it has performed in connection with the construction contract. Conforming, nonconforming, and retesting shall be tabulated. The tabulation(s) shall be certified as complete, and signed by the authorized representative of the laboratory, and shall be delivered to the Contracting Officer.

## PART 2 - EXECUTION

2.1 QUALITY CONTROL REQUIREMENTS: In accordance with the General Provisions Clause entitled "Contractor Inspection System," the Contractor shall inspect and test all work under the contract and maintain records of the inspections and tests; however, the Government will perform testing when so stated in the specifications. Approvals, except those required for field installations, field applications, and field tests, shall be obtained before delivery of materials and equipment to the project site. Surveillance of the inspection system will be performed by the Contracting Officer.

2.1.1 Factory Tests: Unless otherwise specified, the Contractor shall arrange for factory tests when they are required under the contract.

2.1.2 Factory Inspections by the Contractor: Unless otherwise specified, the Contractor shall arrange and perform all factory inspections specifically required in the technical sections of the specifications. These inspections shall be reported in the Daily Report to Inspector.

2.1.3 Field Inspections and Tests by the Contractor: The Contractor shall furnish all equipment, instruments, qualified personnel, and facilities necessary to inspect all work and perform all tests required by the contract. All inspections and tests performed and test results received each day shall be included in the Daily Report to Inspector.

2.1.4 Field Inspections and Tests by the Government: If deemed necessary by the Contracting Officer, field inspections and tests will be made in accordance with the General Provisions Clause entitled "Inspection and Acceptance."

2.1.5 Approval of Testing Laboratories: All laboratory work under this contract shall be performed by a laboratory approved by the Government, whether the laboratory is employed by the Contractor, or is owned and operated by the Contractor. The basis of approval includes the following:

- a. Testing laboratories performing work in connection with concrete, steel, and bituminous materials shall comply with ASTM E 329 and ASTM D 3666, respectively.
- b. Testing laboratories engaged in the testing and inspection of soils and rock or performing non-destructive testing shall comply with ASTM D 3740 and ASTM E 543, respectively.
- c. Testing laboratories performing work not in connection with concrete, steel, bituminous materials, soils and non-destructive testing shall comply with ASTM E 548.

2.1.5.1 Laboratory Inspection: Prior to approval the laboratory shall submit in writing the following:

- a. Functional description of the laboratories organizational structure, operational departments, and support departments and services.
- b. A list and resume of the personnel assigned to the proposed testing, including the person charged with engineering managerial responsibility.
- c. Affidavit of compliance with the applicable ASTM publication and certification that the laboratory performs work in accordance with technical requirements as required by the contract specifications.
- d. A list of test and inspection equipment for each of the proposed test procedures and certification that the equipment is calibrated at prescribed intervals to insure the validity of the test and inspection data.
- e. A copy of any recent certification of inspection report of the laboratory by a nationally recognized agency, including a statement of corrections made based on the findings of the agency. In the absence of inspection by a nationally recognized agency, the laboratory will be subject to inspection by the Contracting Officer upon receipt of all the above information 30 days before the required approval of the testing laboratory.

2.1.6 Repeated Tests and Inspections: The Contractor shall repeat tests and inspections after each correction made to nonconforming materials and workmanship until tests and inspections indicate the materials, equipment, and workmanship conform to the contract requirements. The retesting and reinspections shall be performed at no additional cost to the Government.

2.1.7 Daily Report to Inspector: The signed "Daily Report to Inspector" Form NAVFAC 4330/34 shall be submitted to the Contracting Officer by 10:00 AM on the working day following the day the work was performed.

\*\*\* END OF SECTION \*\*\*



## INSTRUCTIONS

1. This form may be used by the Contractor for listing all material submittals that require action by either the Contractor or the Government.
2. Columns (a) through (e) should be completed by the Contractor and must include all submissions that are required by the specifications.
3. As submittals are received and processed, the remaining columns are to be completed by the Contractor.
4. In column (f) for those items requiring ROICC action (action code "D"), THE REASON FOR FORWARDING TO THE ROICC should be entered in the column (l), the remarks column; e.g., Government approval required; waiver requested because of variance, substitution, etc.
5. Column (j) is completed when material or equipment is delivered to the project. Column (k) is completed only after verification that the delivered item is that represented by the approved submittal.

ACTION CODE: To be used when completing columns (f) and (h)

A - Approved as submitted	D - Forwarded to ROICC for action
B - Approved as noted	E - Forwarded to ROICC for record purpose
C - Disapproved	

## SECTION 01501. ENVIRONMENTAL PROTECTION

1. ENVIRONMENTAL PROTECTION PLAN: The Contractor shall be responsible for the preparation and submission of an environmental protection plan. After the contract is awarded, but prior to the commencement of the work, the Contractor shall meet with the Contracting Officer, or his representative, and discuss the proposed environmental protection plan. The meeting shall develop mutual understanding relative to details of environmental protection, including required reports and measures to be taken should the Contractor fail to provide adequate protection in an adequate and timely manner. Not more than 14 days after the meeting, the Contractor shall submit for approval his proposed environmental protection plan.

2. GENERAL REQUIREMENTS: The Contractor shall provide and maintain environmental protection during the life of the contract as defined herein. The Contractor's operations shall comply with all Federal, State, and Local regulations pertaining to water, air, solid waste, and noise pollution.

### 3. DEFINITIONS OF POLLUTANTS:

3.1. Non-hazardous wastes: Solid or liquid substances that are to be discarded by the Contractor and that normally do not constitute a hazard to man or to the environment. This includes, but is not limited to, paper, metal (other than toxic metals such as lead and mercury), masonry, wood, brick, stone, asphaltic concrete, plastics, rubber, rubbish and concrete.

3.2. Hazardous wastes: Solid and liquid substances that are to be discarded by the Contractor and that constitute a significant active or potential hazard to man and/or to the remainder of the environment. This includes, but is not limited to, asbestos, glass, lead, mercury, pesticides, herbicides, other toxic chemicals and waste, liquid petroleum products, human excrement, garbage, sediment, and radioactive materials.

3.2.1. Sediment: Soil that has been eroded and transported by running water.

3.2.2. Garbage: Waste foodstuffs.

3.2.3. Human excrement: Solid or liquid wastes produced by the human body.

### 4. PROTECTION OF NATURAL RESOURCES:

4.1. General: It is intended that the natural resources within the project boundaries and outside the limits of permanent work performed under this contract be preserved in their existing condition or be restored to an equivalent or improved condition upon completion of the work. The Contractor shall confine his construction activities to areas defined by the work schedule, plans, and specifications.

4.2. Land Resources: The Contractor shall not remove, cut, deface, injure, destroy trees or shrubs without written permission from the Contracting Officer. No ropes, cables, or guys shall unless specifically authorized. Where such special emergency use is permitted, the Contractor shall be responsible for repairing or replacing any damage resulting from such use.

4.2.1. Protection Plan: Where trees may possibly be defaced, bruised, injured or otherwise damaged by the Contractor's activity, equipment, or by his dumping, or other operations, the Contractor shall submit a plan for protecting such trees. Monuments, markers and works of art shall be protected before beginning operations.

4.2.2. Repair or Restoration: Any trees or other landscape features scarred or damaged by the Contractor's equipment or operations shall be repaired and/or restored to their original condition at the Contractor's expense. The Contracting Officer shall approve the repair and/or restoration planned prior to its initiation.

4.2.3. Temporary Construction: The Contractor shall obliterate all signs of temporary construction facilities such as work areas, structures, stockpiles of excess or waste materials, or any other vestiges of construction as directed by the Contracting Officer.

4.3. Water Resources: It shall be the responsibility of the Contractor to investigate and comply with all applicable Federal, State, and Local regulations concerning the discharge (directly or indirectly) of pollutants to the underground and natural waters. All work under this contract shall be performed in such a manner that any adverse environmental impacts are reduced to a level that is acceptable to the Contracting Officer.

4.4. Oily Substances: At all times, special measures shall be taken to prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water in such quantities as to affect normal use, aesthetics or produce a measurable ecological impact on the area.

4.5. Historical and Archaeological Resources: All items having any apparent historical or archeological interest which are discovered in the course of any construction activities shall be carefully preserved and reported immediately to the Contracting Officer for determination of actions to be taken.

#### 5. EROSION AND SEDIMENT CONTROL MEASURES:

5.1. Burn-off of Ground Cover will not be permitted.

5.2. Reduction of Exposure of Unprotected Erodible Soils: Earthwork which has been brought to final grade shall immediately be paved or otherwise finished as indicated and specified. All earthwork shall be planned and conducted in such a manner as to minimize the area and duration of exposure of unprotected soils.

5.3. Temporary Protection of Erodible Soils: Such methods as may be necessary shall be utilized to effectively prevent erosion and control sedimentation, including, but not limited to, the following:

5.3.1. Mechanical Retardation and Control of Runoff: The rate of runoff from the construction site shall be mechanically retarded and controlled. This includes construction of diversion ditches, benches, and berms, to retard and divert runoff to protected drainage courses.

5.3.2. Sediment Basins: Sediment shall be trapped in temporary or permanent sediment basins. The basins shall be designed (sized) to accommodate the runoff of a local 10-year storm and shall be pumped dry and all sediment removed after each storm. Overflow shall be by paved weir or by vertical overflow pipe, draining from the surface. The collected sediment shall, for example: (1) be returned to the source of erosion, (2) be used as fill on the construction site, or (3) be used as fill at other sites. The Contractor shall institute effluent quality monitoring programs as required by State and Local environmental agencies.

5.3.3 Buffer Zones: No land-disturbing activity shall be permitted in proximity to a lake or natural watercourse unless a buffer zone is provided along the margin of the watercourse of sufficient width to confine visible siltation within the twenty-five percent of the buffer zone nearer the land-disturbing activity, provided, that this paragraph shall not apply to a land-disturbing activity in connection with the construction of facilities to be located on, over, or under a lake or natural watercourse.

5.3.4. Angle for Graded Slopes and Fills shall be no greater than the angle which can be retained by vegetative cover or other adequate erosion control devices or structures. In any event, slopes left exposed will, within 30 working days of completion of any phase of grading, be planted or otherwise provided with ground cover, devices, or structures sufficient to restrain erosion.

5.3.5. Revegetation: Whenever land-disturbing activity is undertaken on a tract comprising more than one acre, if more than one contiguous acre is uncovered, a ground cover sufficient to restrain erosion must be planted or otherwise provided within 30 working days on that portion of the tract upon which further active construction is not being undertaken.

## 6. CONTROL AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS WASTES:

6.1. Non-hazardous wastes, except rubble, shall be picked up and disposed of daily or placed in containers which are emptied on a weekly schedule. All handling and disposal shall be so conducted as to prevent contamination of the site and any other areas. The Contractor shall transport all such waste and dispose of it in the Base Sanitary Landfill, unless otherwise approved. If transporting any material off Government property, the Contractor shall provide the Contracting Officer a copy of State and/or local permit which reflects the responsible agency's approval of the disposal area and proposed waste disposal methods. Rubble such

as masonry, stone, concrete without reinforcing steel, and brick shall be deposited as directed near Building 1317 or at the site of the old Camp Geiger Sanitary Landfill. Upon completion, the work and disposal areas shall be left clean and natural looking. All signs of temporary construction and activities incidental to construction of the required permanent work in place shall be obliterated.

6.2. Hazardous Wastes:

6.2.1. Garbage Disposal: The Contractor shall transport his garbage to the Base Sanitary Landfill. The preparation, cooking and disposing of food are strictly prohibited on the project site.

6.2.2. Sewage, Odor, and Pest Control: Chemical toilets or comparably effective units shall be used with wastes periodically emptied into municipal, district or Base sanitary sewage systems. Provisions shall be included for masking or elimination of odors and pest control. Compliance with Federal, State, and Local regulations shall be established by the Contractor providing the Contracting Officer with a copy of the permit or license when applicable.

6.2.3. Liquid wastes shall be stored in corrosion-resistant containers, removed from the project site, and disposed of not less frequently than monthly unless directed otherwise. Disposal of liquid waste shall be in accordance with Federal, State, and Local regulations. Fueling and lubricating of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spills and evaporation. For oil and hazardous material spills which may be large enough to violate Federal, State, and Local regulations, the Contracting Officer shall be notified immediately.

END OF SECTION

## SECTION 02050

### DEMOLITION AND REMOVAL

#### PART I - GENERAL

1.1. SUBMITTALS: Submit proposed demolition and removal procedures to the Contracting Officer for approval before work is started. Procedures shall provide for (careful removal and disposition of materials specified to be salvaged,) coordination with other work in progress, a disconnection schedule of utility services, a detailed description of methods and equipment to be used for each operation, and sequence of operations.

1.2. REQUIREMENTS: The work includes demolition or removal of all construction indicated or specified. All materials resulting from demolition work, except as indicated or specified otherwise, shall become the property of the Contractor and shall be removed from the limits of Government property. Remove rubbish and debris from the station daily, unless otherwise directed; do not allow accumulations inside or outside the building(s). Store materials which cannot be removed daily in areas specified by the Contracting Officer.

1.3. DUST CONTROL: Take appropriate action to check the spread of dust to occupied portions of the building and to avoid the creation of a nuisance in the surrounding area. Do not use water if it results in hazardous or objectionable conditions, such as ice, flooding or pollution. Comply with all dust regulations imposed by local air pollution agencies.

#### 1.4. PROTECTION:

1.4.1 Buildings: Protect existing work that is to remain in place, that is to be reused, or that is to remain the property of the Government by temporary covers, shoring, bracing, and supports. Repair items damaged during performance of the work or replace with new. Do not overload structural elements. Provide new supports or reinforcement for existing construction weakened by demolition or removal work.

1.4.2 Weather Protection: Protect building interior and all materials and equipment from the weather at all times. Where removal of existing roofing is necessary to accomplish work, have materials and workmen ready to provide adequate and approved temporary covering of exposed areas. Temporary coverings shall be attended, as necessary, to insure effectiveness and to prevent displacement.

1.4.3 Trees: Protect trees within the project site which might be damaged during demolition, and which are indicated to be left in place, by a 6-foot high fence. Erect fence a minimum of 5-feet from the trunks of individual trees or follow the outer perimeter of branches of clumps of trees. Restore trees scarred or damaged by Contractor equipment or operations to their original condition or replace as determined by the Contracting Officer. The Contracting Officer shall approve restoration prior to its initiation.

1.4.4 Personnel: Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Notify the Contracting Officer prior to beginning any such work.

1.5. EXPLOSIVES: Use of explosives will not be permitted.

## PART 2 - EXECUTION

### 2.1 EXISTING FACILITIES TO BE REMOVED:

2.1.1 Structures: Remove indicated existing structures to 3 feet below existing adjacent grade.

#### 2.1.2 Utilities:

2.1.2.1 Utility Services: Disconnections of utility services and related meters and equipment are included under Section entitled Utilities and Related Equipment.

2.1.2.2 Utilities and Related Equipment: Remove all existing utilities, as indicated and terminate in a manner conforming to the nationally recognized code covering the specific utility and at a time satisfactory to the Contracting Officer. Remove meters and related equipment and deliver to a location on the station in accordance with instructions of the Contracting Officer or his representative without additional cost to the Government. Dispose utility lines encountered that are not shown on the drawings in accordance with instructions of the Contracting Officer. Disposal shall be covered by "Differing Site Conditions" in accordance with General Provisions.

2.1.3 Paving and Slabs: Remove concrete and asphaltic concrete paving and slabs including aggregate base as indicated to a depth of 3 feet below existing adjacent grade.

### 2.3 DISPOSITION OF MATERIAL:

2.3.1 Title to Materials: Title to all materials and equipment to be removed, except as specified otherwise, is vested in the Contractor upon receipt of notice to proceed. The Government will not be responsible for the condition or loss of, or damage to, such property after notice to proceed. Materials and equipment shall not be viewed by prospective purchasers or sold on the site.

### 2.4 CLEANUP:

2.4.1 Debris and Rubbish: Remove and transport debris and rubbish in a manner that will prevent spillage on streets or adjacent areas. Cleanup spillage from streets and adjacent areas.

2.4.2 Regulations: Comply with Federal, State, and Local hauling and disposal regulations.

END OF SECTION

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SECTION 02200

EARTHWORK

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 the basic designation only.

1.1.1 American Society for Testing and Materials (ASTM) Publications:

- |                       |  |
|-----------------------|--|
| C 136-76              | Sieve or Screen Analysis of Fine and Coarse Aggregates   |
| D 423-66<br>(R 1972)  | Liquid Limit of Soils  |
| D 424-59<br>(R 1971)  | Plastic Limit and Plasticity Index of Soils  |
| D 1140-54<br>(R 1971) | Amount of Material in Soils Finer than the No. 200 (75 micrometer) Sieve   |
| D 1557-78             | Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb. (4.54 kg) Rammer and 18-in. (457-mm) Drop |
| D 2487-69<br>(R 1975) | Classification of Soils for Engineering Purposes   |
| D 2922-78             | Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)   |
| D 3017-78             | Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)                                |

## PART 2 - PRODUCTS

2.1 SOIL MATERIALS: In general, shall be free of debris, roots, wood, scrap material, vegetable matter, refuse, soft unsound particles, frozen, deleterious, or objectionable materials.

2.1.2 Backfill and Fill: For structures and under spread footings, paving, or concrete slabs on grade which are not pile supported shall conform to the general requirements for soil materials above and shall be classified as SP by ASTM D 2487 and conform to the following: liquid limit shall not exceed 35 percent when tested in accordance with ASTM D 423, plasticity index shall not be greater than 12 percent when tested in accordance with ASTM D 424, and no more than 25 percent by weight shall be finer than No. 200 sieve when tested in accordance with ASTM D 1140.

2.1.3 General Site Fill: And embankment material shall conform to the general requirements for soil materials above and shall be classified as SP by ASTM D 2487. Maximum particle size shall be 6 inches.

2.1.4 Topsoil: Shall be material free of subsoil, stumps, rocks larger than one inch diameter, brush, weeds, toxic substances, and other material or substance detrimental to plant growth. Topsoil shall be a natural, friable soil representative of productive soils in the vicinity. The pH range shall be from 5.5 to 7.5. Topsoil that does not meet this pH range shall be amended by the addition of pH adjusters.

2.1.5 Borrow: Obtain borrow materials from the station borrow pit or from sources outside the station, at the Contractor's option. The station borrow pit is located within a haul distance of 5 miles from the site of the work. If the station borrow pit is used, the Contractor, at his expense, shall perform any clearing, grubbing, and stripping required for providing access to suitable borrow material and shall dispose of materials from clearing and grubbing operations off the station. The Contractor, at his expense, shall also remove and stockpile the top 12 inches of soil material in the area in which he is to get the borrow. After the borrow material has been removed, trim the borrow pit neatly, grade to drain properly and replace the stockpiled soil material and level over the borrow area. If the borrow materials are provided from sources outside the station, they shall be at the Contractor's expense.

## PART 3 - EXECUTION

### 3.1 SURFACE PREPARATION:

3.1.1 Clearing and Grubbing: Remove all trees, logs, shrubs, and brush within the indicated clearing limits. Properly protect from damage trees and shrubs which are not to be cut. Cut all merchantable timber into cordwood and store on the site where directed. Remove stumps

entirely. Grub out roots and matted roots to at least 18 inches below the existing surface. Dispose of brush, refuse, stumps, roots, and unmerchantable timber outside the station.

3.1.2 Topsoil: Strip existing topsoil to a depth of 4 inches, stockpile separately from other excavated materials, and reuse for finished surface grading. Topsoil shall be free of stones, wood matter, cuttings, excessive quantities of vegetation, and debris of every kind. Locate piles of topsoil so that the material can be used readily for finished surface grading; protect topsoil and maintain until needed. The top 4-inch thickness of all newly graded earth surfaced areas shall consist of topsoil. If there is insufficient topsoil available to form the 4-inch thickness, utilize that available as directed. The Contractor will not be required to haul in additional topsoil if all requirements specified are complied with placing of topsoil is specified in Section 02822 "Establishing Vegetation".

3.1.3 Unsuitable Material: Remove vegetable matter, sod, muck, and rubbish under embankments which are less than 4 feet in thickness and under pavements or concrete slabs.

3.2 EXCAVATION: Shall be to the contours and dimensions indicated. Keep excavations free from water while construction is in progress. Notify the Contracting Officer immediately in writing in the event that it becomes necessary to remove hard, soft, weak, or wet material to a depth greater than indicated and an adjustment in contract price will be considered in accordance with "Differing Site Conditions" paragraph of the General Provisions. Refill excavations cut below the depths indicated, unless otherwise specified, with fill and compact to 95 percent of ASTM D 1557 maximum density. Excavate and refill soil disturbed or weakened by the Contractor's operations and soils permitted to soften from exposure to weather with fill and compact to 95 percent of ASTM D 1557 maximum density. All additional work of this nature will be at the Contractor's expense.

3.2.1 Excavations for Structures and Spread Footings: If cut below depths indicated shall be filled with concrete when the foundations or footings are placed.

3.2.2 Excavation of Pipe Trenches: Excavation shall be to grade unless otherwise directed in the event of poor soil or excavation in rock. Width of trench shall be as shown on the Standard Pipe Trench Bedding details accompanying this section. Compaction of soil in the backfilling operation shall be as specified herein.

### 3.3 FILLING AND BACKFILLING:

3.3.1 Backfill for Structures: Place under spread footings and concrete slabs not pile supported in lifts of 6 inches thick and compact each lift as specified herein before the overlaying lift is placed. Backfill adjacent to structural elements shall be placed, as far as practicable, as the adjacent structural elements have been completed and accepted. Backfill against concrete only when directed by the Contracting Officer.

3.3.2 General Site Fill and Embankments: Place in lifts of 6 inches thick and compact as specified herein, before the overlaying lift is placed. In all areas not accessible to rollers or compactors, compact the fill with mechanical hand tampers. If the mixture is excessively moistened by rain, aerate it by means of blade graders or harrows until the moisture content of the mixture is satisfactory. Finish the surface of the layer by blading or rolling with a smooth roller, or a combination thereof; surface shall be smooth.

#### 3.4 COMPACTION OF SUBGRADES:

3.4.1 Subgrade of Soils in Cut: For structures, concrete floor slabs and paved areas shall have a density of 95 percent of ASTM D 1157 maximum density to a depth of 12 inches; if the existing subgrade natural density is less than 95 percent of ASTM D 1157 maximum density, compact to that value.

3.4.2 Structure, Spread Footing, and Concrete Floor Slab: Compact subgrades to 95 percent of ASTM D 1157 maximum density.

3.4.3 Adjacent Area: Compact subgrade adjacent to but not supporting any structural elements or areas within 5 feet of structures to 90 percent of ASTM D 1157 maximum density.

3.4.4 Paved Area: Compact subgrade to 95 percent of ASTM D 1157 maximum density in the upper 12 inches of the subgrade.

3.4.5 General Site: Compact area and embankment subgrades under vegetation to 85 percent of ASTM D 1157 maximum density.

3.4.6 Primary Road: Compact subgrade of soils in cut and fill to 95 percent of ASTM D 1157 maximum density.

#### 3.5 FINISH OPERATIONS:

3.5.1 Grading: Shall be to finished grades indicated within one tenth of a foot. Grade areas to drain water away from structures and to provide suitable surfaces for mowing machines. Grade as directed existing grades which are to remain but are disturbed by the Contractor's operations.

3.5.2 Spreading Topsoil: Areas indicated to receive topsoil for the finished surface shall be free of materials that would interfere with planting and maintenance operations. Do not place topsoil when the subgrade is frozen, extremely wet or dry, or in other conditions detrimental to seeding, planting, or grading. Comply with the requirements of Section 02822, "Establishing Vegetation".

3.5.3 Borrow Areas: Grade to drain properly. Maintain and restore borrow pits as specified in Section 01501, "Environmental Protection."

3.5.4 Disposition of Surplus Material: Remove from Government property surplus or other soil material not required or suitable for filling,

backfilling, or embankment. Comply with the requirements of Section 01501, "Environmental Protection."

3.5.5 Protection of Surfaces: Protect newly graded areas from traffic, erosion, and settlements that may occur and as required in Section 01501, "Environmental Protection". Repair or re-establish damaged grades, elevations, or slopes.

### 3.6 FIELD SAMPLING AND TESTING:

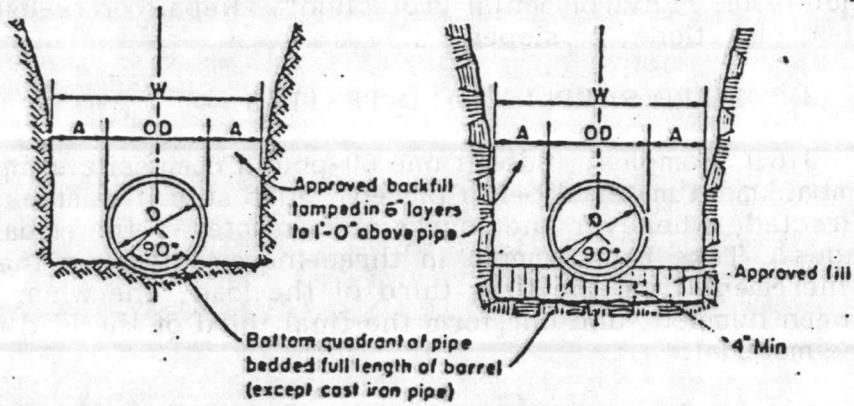
3.6.1 Samples: Submit one 50-pound composite sample for each site of embankment material being placed. Also submit samples, in the number of directed, whenever the source or character of the embankment material changes. Take each sample in three increments from the same truck -- one increment from the first third of the load, one when half of the load has been dumped, and one from the final third of the load during dumping of the material.

Deposit each sample in a clean container fastened to prevent loss of material. Tag each sample for identification. The tag shall contain the following information:

Contract No. \_\_\_\_\_  
Sample No. \_\_\_\_\_  
Date of Sample \_\_\_\_\_  
Sampler \_\_\_\_\_  
Source \_\_\_\_\_  
Intended Use \_\_\_\_\_

3.6.2 Tests: Test fill in accordance with ASTM C 136 for conformance to ASTM C 33, ASTM D 2419, and ASTM D 2487 gradation limits. Test fill for material finer than the No. 200 sieve in accordance with ASTM D 1140. Test fill for liquid limit in accordance with ASTM D 423 and for plasticity index in accordance with ASTM D 424. Test fill materials for moisture density relations in accordance with ASTM D 1557. Perform one of each of the required tests for each material used when directed. Provide additional tests as specified above for each source change. Perform density tests in randomly selected locations and in accordance with ASTM D 1556 as follows: one test per well site.

END OF SECTION.



TRENCH IN EARTH

TRENCH IN ROCK

PIPE DIA "D"	MAXIMUM "A"
6" to 15"	8"
18" to 21"	10"
24" to 30"	12"
33" to 42"	15"
48" & Larger	18"

Maximum trench width "W"  
taken at top of pipe

STANDARD PIPE TRENCH BEDDING

## SECTION 02250

### SOIL TREATMENT FOR TERMITE CONTROL

1. DELIVERY AND STORAGE: Insecticides shall be delivered to project site in sealed and labeled containers as supplied by manufacturer or formulator. The label shall be complete with application instructions and bear current Environmental Protection Agency registration in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act, as amended.

2. MATERIALS: The insecticides shall be one of the following waterbased emulsions uniform in composition throughout and containing in concentration by weight:

- a. Dieldrin, 0.5 percent; or
- b. Aldrin, 0.5 percent; or
- c. Heptachlor, 0.5 percent

Diluent will not include any other pesticide residues or rinsates.

### 3. APPLICATION:

3.1 General: At the time soil treatment is to be applied, the soil to be treated shall be preferably in a friable condition with a sufficiently low moisture content to allow uniform distribution of the soil treatment agent throughout the soil. Application shall not be made immediately after heavy rains. Apply insecticide as a coarse spray and in such manner as to provide uniform distribution of the insecticide on the soil surface. Apply insecticide at least 12 hours prior to placement of concrete which will be in contact with treated material. If concrete is not poured on the same day as the soil treatment is applied, polyethylene sheeting or other waterproof material shall be placed over the treated area(s). Apply insecticide immediately prior to placement of vapor barrier or waterproof membrane. Where treated soil or fill material is not to be covered with a vapor barrier or waterproof membrane, adequate precautions shall be taken to prevent its being disturbed. Where soil or fill material is disturbed after treatment and before placement of slabs or other covering structures, it shall be retreated in the same manner as original treatment. Treatment of the soil on the exterior sides of foundation walls, grade beams, and similar structures shall be coordinated with final grading and planting operations so as to avoid disturbance of the insecticide barriers by such operations. Manufacturer's directions for use, warnings and precautions shall be observed in the handling and use of insecticides. Care shall be taken so that these chemicals do not enter water system and that they do not endanger the environment.

3.2 Slabs on Grade: Test area to be covered by concrete slabs on grade at a rate of not less than 1-1/2 gallons per 10 square feet. Apply additional treatment as follows: (1) In critical areas such as around utility openings for pipes, conduits and ducts, apply 0.5 gallon per square foot in a strip 6 inches wide; and (2) along the exterior perimeter of the slab and under expansion joints, apply 2 gallons per 5 linear feet in a strip one foot wide in shallow trench.

4. CERTIFICATION: Upon final completion of the soil treatment, and as a condition for final acceptance, the Contractor shall furnish a written certificate stating:

a. Chemical used had at least the proper required concentration; the type and brand name of chemical; and name of the manufacturer thereof.

b. Rate and method of application complied in every respect with the standards contained herein.

END OF SECTION

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## SECTION 02501

### STORM DRAINAGE SYSTEMS

1. APPLICABLE PUBLICATIONS: The following publications of the issues listed below, but referred to hereinafter by basic designation only, form a part of this specification to the extent required by the references thereto (where a number is suffixed to the specification number, it denotes the effective amendment to the specification):

#### 1.1 Federal Specifications:

- |              |   |
|--------------|---|
| RR-F-621b    | Frames, covers, gratings, steps, sump and catch basin, manhole. |
| WW-P-405B(1) | Pipe, corrugated (iron or steel, zinc coated).                  |

#### 1.2 American Society for Testing and Materials (ASTM):

- |           |   |
|-----------|---|
| C 76-74   | Reinforced Concrete Culvert, Storm Drain and Sewer Pipe   |
| C 443-74  | Joints for circular concrete sewer and culvert pipe, using flexible, watertight, rubber type gaskets. |
| C 663-73a | Asbestos cement storm drain pipe.   |

#### 1.3 North Carolina Department of Transportation and Highway Safety (NCDOT):

- "Standard Specifications for Roads and Structures", dated July 1, 1978.  
"Roadway Standards", dated July 1, 1972.

2. QUALITY CONTROL: All field tests to determine conformance with the specified requirements shall be performed in the presence of the Contracting Officer.

#### 3. SUBMITTALS:

3.1 Material Tests and Test Reports: The testing requirements for materials incorporated in referenced documents will be waived provided the manufacturer submits certificates stating that previously manufactured materials have been tested by recognized laboratories, that such materials meet testing requirements specified, and that the materials furnished for this project are of the same type, quality, manufacture and make as that tested. Copies of the test reports need not be submitted except as specifically requested by the Contracting Officer.

3.2 Certificates: Submit certificates from the manufacturer attesting that the following products conform to all requirements of this specification and of reference documents:

a. Pipe and Jointing Materials

3.2.1 Sample Certificate: The certificate shall not contain statements that could be interpreted to imply that the product does not meet all requirements specified, such as "as good as"; "achieve the same end use and results as materials formulated in accordance with the referenced specifications"; "equal or exceed the service and performance of the specified material". The certificate should simply state that the product conforms to all requirements specified.

SAMPLE CERTIFICATE

The manufacturer hereby certifies that the following products being furnished for this project conform to all requirements of the project specification and of the reference specifications listed:

MANUFACTURER AND PRODUCT

John Doe Company  
Portland Cement, Type I

REFERENCE SPECIFICATION

ASTM C150-74, Type I

SIGNATURE AND TITLE

3.3 Catalog Data: Submit complete descriptive literature for each type of each of the following items. Data which describe more than one type, size, model, or item shall be clearly marked to indicate which type, size, model, or item the Contractor intends to provide. Data shall be sufficient to show conformance to specified requirements.

a. Pipe Couplings and Gaskets

4. STORAGE AND HANDLING: Proper facilities shall be provided for handling and lowering sections of pipe into place to avoid injury or damage. Damaged pipe or pipe with damaged coatings shall be removed from the site and replaced with satisfactory pipe at no additional cost to the Government.

5. MATERIALS:

5.1 Concrete Pipe: Pipe sizes under 12-inch diameter shall be nonreinforced concrete pipe. Pipe sizes 12-inch diameter through 24-inch diameter may be either reinforced or non-reinforced concrete pipe. Pipe sizes larger than 24-inch diameter shall be reinforced concrete pipe.

5.1.1 Reinforced Concrete Pipe: ASTM C76. Pipe shall be Class III, unless otherwise indicated.

5.1.2 Nonreinforced Concrete Pipe: ASTM C14, Class 2.

5.2 Joints for Concrete Pipe: Joints shall be one of the following types:

- a. Bell and spigot with rubber gaskets
- b. Tongue and groove with rubber gaskets
- c. Tongue and groove with preformed plastic gaskets

5.2.1 Rubber Gaskets: ASTM C443. Only a neutral agent shall be used as a lubricant.

5.2.2 Preformed Plastic Gaskets:

5.3 Corrugated Metal Pipe:

5.3.1 Corrugated Iron or Steel Pipe: WW-P-405 for Class I or II Shape Round, Coating A, half paved. Minimum gage of metal, before coating, shall be 16 Gauge.

5.4 Asbestos Cement Pipe: ASTM C 663, Type II Pipe, Class shall be III.

5.5 Joints in Asbestos Cement Pipe: As specified in ASTM C 663.

5.6 Flared Ends: NCDOT "Standard Specifications for Roads and Structures". Material used shall be the same as that used for the pipe. Flared ends are in addition to the lengths of pipe shown. Grading at flared ends, unless otherwise shown, shall be in accordance with the applicable standard of the NCDOT "Standard Specifications for Roads and Structures" with respect to the type of material used for flared ends, i.e., concrete or metal.

6. REQUIREMENTS: Work in this section includes storm drainage systems outside of buildings. Drain piping within buildings and within the five-foot building line (line drawn five feet outside the outside face of building walls and parallel thereto) is specified in the section entitled "Water Well - Mechanical Work". Concrete, asbestos cement, or corrugated metal pipe shall be used for storm drainage system. Excavating, trenching, backfilling, and density tests are specified in section titled, "Earthwork". Concrete is specified in section titled, "Cast-In-Place Concrete".

7. INSTALLATION: Each section of pipe shall be carefully examined before being laid, and defective or damaged pipe shall not be used. Proper facilities shall be provided for lowering sections of pipe into trenches. Lifting lugs in vertically elongated metal pipe shall be placed in the same vertical plane as the major axis of the pipe. Under no circumstances shall pipe be laid in water, and no pipe shall be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary. Pipe shall be laid true to the grades indicated and shall rest upon the pipe bed for the full length of each section. Provide batterboards spaced not more than 26 feet apart along the trench for checking installation of pipe to insure proper slope and elevation. Laser beam method may be used for insuring proper slope and elevation. Runs of pipe shall be laid with outside laps or grooved ends upgrade beginning at the lower end of the pipe line. Pipe having its grade or joint disturbed

after laying shall be taken up, cleaned, and relaid. When pipes are protected by head walls or connect with drainage structures, the exposed ends of the pipe shall be placed or cut flush with the face of the structure. After the pipe is cut, the rough edges shall be smoothed up in an approved manner. All pipe shall be laid so that markings are on top and the inner surfaces abut neatly, tightly, and smoothly. All pipe in place shall be inspected and approved before being covered and concealed.

7.1 Corrugated Metal Pipe Joints: Pipes shall be butted to form a smooth joint; the space between the pipe and coupling bands shall be kept free from dirt and grit so that the corrugations fit snugly. The coupling band while being tightened shall be tapped with a softhead mallet of wood, rubber, or plastic to take up slack and insure a tight joint. The annular space between shutting sections of paved invert pipe in sizes 30-inches and larger shall be filled with bituminous material after jointing. Coupling band bolts and damaged areas of the coupling bands and pipe shall be given a coating of asphalt cement. Pipe on which the asphalt coating has been damaged to such extent that satisfactory field repairs cannot be made will be rejected.

## 7.2 Concrete Pipe Joints:

7.2.1 Rubber gasket and preformed plastic joint installation shall be in accordance with the printed recommendations of the manufacturer of the joint material. Surfaces to receive lubricants, cements, or adhesives shall be clean and dry. Gaskets and jointing materials shall be affixed to the pipe not more than 24 hours prior to the installation of the pipe, and shall be protected from the sun, blowing dust, and other deleterious agents at all times. Gaskets and jointing materials shall be inspected before installation of the pipe, and any loose or improperly affixed gaskets and jointing materials shall be removed and replaced.

The pipe shall be aligned with the previously installed pipe, and the joint pulled together. If, while making the joint, the gasket or jointing material becomes loose and can be seen through the exterior joint recess when the joint is pulled up to within one inch of closure, the pipe shall be removed and the joint remade.

7.3 Asbestors Cement Pipe Joints: Installation shall be in accordance with the printed instructions and recommendations of the pipe manufacturer.

END OF SECTION

SECTION 02581

ROTARY DRILLED WATER WELL

1. APPLICABLE PUBLICATIONS: The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto:

1.1 Federal Specification (Fed. Spec.):

GG-G-76D Gages, Pressure and Vacuum, Dial Indicating for Air, Water, Hydrocarbon Gases, and Compressed Gases.

1.2 American Society for Testing and Materials (ASTM) Publications:

A120-77 Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary Uses (ANSI/ASTM A120)

B88-76 Seamless Copper Water Tube (ANSI/ASTM B88)

C150-78 Portland Cement (ANSI/ASTM C150)

1.3 American Water Works Association (AWWA) Publications:

A100-66 Deep Wells

C601-68 Disinfecting Water Mains

2. SUBMITTALS:

2.1 Shop Drawings: Submit shop drawings or catalog cuts showing all well components and details of well casings, well screens, air lines, and gages. The shop drawings or catalog cuts shall be accompanied by a cross section showing the relative size, location, and spacing of the well components such as the hole size, outer casing, inner casing, well screen, gravel fill, air line and gage, and grout.

2.2 Certificates of Conformance or Compliance: Certificates of conformance or compliance are required for the following:

- a. Gravel
- b. Cement
- c. Drilling Clay

2.3 Samples: Submit one five-pound sample of gravel.

3. DELIVERY, STORAGE, AND PROTECTION: Deliver materials in an undamaged condition. Carefully store materials off the ground to provide proper protection against oxidation caused by ground contact. Replace defective or damaged materials.

4. MATERIALS: Materials shall conform to the respective specifications and other requirements as specified herein.

4.1 Casings: ASTM A120; outer casing, 24 inches nominal diameter, 0.375 inches wall thickness, black steel pipe; inner casing, 10 inches nominal diameter, .365 inches wall thickness, black steel pipe. Casings shall have welded joints.

4.2 Well Screens: Type 304 or 316 stainless steel, 10 inches inside diameter, continuous slot type. Screens shall have adequate strength to resist all external forces to which they will be subjected, both during and after installation. Length shall be as required to provide the quantity of water specified. Water velocity through openings shall not exceed 0.1 feet per second. Determine the well screen openings from an analysis of the sand in the water bearing strata. Fit a back-pressure valve to the bottom of the screen to permit washing without the inflow of sand into the screen. Joints shall be of the same material as the screen, and shall be butt type welding rings.

4.3 Gravel: Clean, round, hard, water worn quartz or granite with less than 5 percent feldspar, no fossils, carbonate, or organics, and of proper size and gradation that it will allow free flow of water in the well and prevent the infiltration of sand. Gravel size will be selected by the Architect-Engineer firm, based upon the analysis of the sand in the water bearing strata. Thoroughly sterilize gravel with hypochlorite before using.

4.4 Grout: Cement grout, type I portland cement conforming to ASTM C 150, and water. The mixed grout shall contain no more than 6 gallons of water per cubic foot of cement.

4.5 Air Line: ASTM B88, Type K, copper tube, 1/2 inch diameter.

4.6 Air Gage: Fed. Spec. GG-G-76, class 1, Style X, 4 1/2-inch, brass case, bronze tube, calibrated in feet of water.

4.7 Drilling Clay: Bentonite type readily thinned with commercial mud thinners or biodegradable polymer mud which will breakdown naturally. The specific gravity and the character of the mud-laden fluid shall be such that the production of the aquifers will not be impaired.

4.8 Auxiliary Equipment: Provide the necessary discharge piping to dispose of pumped water during developing and testing of well a sufficient distance from each well so as to prevent flooding of the site and flow back into the well, as approved by the Contracting Officer.

5. TEST WELL: Drill a test well at the well site before construction of the permanent well is started. Test well shall be of sufficient size to obtain the necessary information required for the construction of the permanent well, but shall be not less than 10 inches. The location, size of well, and method of drilling must be approved before work is started. Test well shall be not less than 250 feet deep. Keep an accurate log and record of all material drilled through and the depths at which changes in formation occur. Do not construct permanent well until

all data submitted for test well has been analysed and approved by the Contracting Officer. Should the data obtained from any test well indicate unfavorable conditions, exploration shall be continued at other locations approved by the Contracting Officer until a suitable well site is located. In the event additional test wells are required and approved, the contract price and time for completion will be adjusted in accordance with the contract. A test well may be incorporated into the finished construction provided it meets the requirements for a finished well. Test well not used in finished construction shall be sealed as recommended in AWWA A100.

5.1 Material Samples: Take samples of the type of material found in each soil stratum and preserve in approved containers furnished by the Contractor. In addition, take samples at five-foot intervals below the static water level to insure that changes in sand size are noted. Label samples to show depth below ground surface and thickness of the stratum from which the samples were obtained. Describe all water bearing strata in detail as to whether material is loose or compact, its color, and if gravel, whether it is water worn or angular. The presence of clay must be noted.

5.2 Water Quality Determination: Collect and have analysed by a testing laboratory approved by the Government, samples of water from all water bearing strata encountered so as to accurately show the quality of water from each stratum. Include bacteriological and physical-chemical analysis, and further include all field and routine analysis data set forth in Parts I and III of DD Form 710, Physical and Chemical Analysis of Water, which accompanies this specification. In addition, analyze the water for any additional suspected minerals or contaminants which would make it unfit for human consumption, such as nitrate, flouride, and mercury.

5.3 Electric Log: Furnish a complete electric log indicating resistivity and potential of all formations.

5.4 Recommendation and Data Submittal: Make recommendations for the permanent wells and submit all data obtained at each well site. Include with the recommendations the appropriate depth, details of construction, length and location of screens, screen openings, gravel size, and an estimation of the quantity of water than can be obtained from each water bearing stratum and from each completed well. Submit electric log, drillers log, time penetration log (time to drill through each formation) and sieve analysis to substantiate recommendations.

6. CONSTRUCTION: Except as modified herein, provide rotary drilled water well in accordance with AWWA A100. The depth of well and number of screens provided shall be adequate to produce a guaranteed capacity of 200 gallons per minute of clear potable water, with a maximum drawdown of 50 feet. Secure all flow from a single aquifer; do not allow mixing of water from different aquifers.

6.1 Drilling: Drill a hole 24 inches in diameter to a minimum depth of 200 feet and to additional depths as required to produce the flow capacity required. When conventional rotary drilling is used accomplish all drilling using drilling clay. Maintain the pH value of the drilling clay

at 7.6 or more at all times, except that for polymer muds maintain the pH at from 5 to 7.

6.2 Outer Casing: Install the outer casing concentrically in the drilled hole and extend the casing down to a minimum depth of 50 feet. Fill the void between the outer casing and the drilling hole with cement grout to seal the outer casing to the wall of the drilled hole. Grout outer casing from the bottom upward so as to effectively seal the void.

6.3 Inner Casing, Well Screens and Gravel: Install the inner casing and well screens concentrically in the outer casing and drilled hole and completely envelope the inner casing and well screens with gravel. Provide sufficient screens at the water-bearing layer to be developed to secure therefrom all available flow. Pump gravel into place under pressure, through a temporary pipe line extending to the bottom of the screen. Raise the pipe line as the gravel fills the hole, so that the lower end of the pipe is always 2 to 6 feet below the gravel level. The gravel shall entirely fill the space around the screens and inner casing, and equipment and methods for placing the gravel shall be approved as adequate to accomplish the result before placement is begun. Control speed of gravel placement such as will prevent bridging and will allow for settlement of the gravel. When the placement of gravel is completed, thin the drilling clay and pump the well free of all sand, mud, drillings, and other foreign matter. Extend the gravel from the bottom to within 10 feet of floor elevation.

6.3.1 Provide the air line at the same time as the inner casing and locate it so as not to interfere with the pumping units provided.

6.3.2 Repairs to Zinc-Coating: Zinc coating on inner casing which is damaged during fabrication and assembly shall be repaired with a galvanizing repair paint.

6.4 Underreaming and Gravel Envelope: After the casing has been set and after the cement has hardened, the Contractor may proceed to underream the sand strata to a diameter not less than the diameter indicated. Extend the underream continuously through the entire depth of the water-bearing strata. Following completion of the underream, completely fill the entire annular space between the screen and the outside wall of the underreamed hole with gravel. Extend the gravel pack a minimum of 40 feet up into the space between the upper casing and the lap pipe. Place the gravel by means of a gravel pipe lowered into the underreamed space.

6.5 Development of Well: Furnish all necessary pumps, compressors, plungers, bailing, or other needed equipment and fully develop the well as necessary to give the maximum yield of water per foot of drawdown and to limit the amount of sand which may be drawn into the well during the life of the well.

6.6 Tests: upon completion of the permanent well, provide a temporary pump in the well for measuring the flow and drawdown. The temporary pump shall have a capacity of not less than 300 gallons per minute. After determining the static water level in the well, begin

pumping at a rate of approximately 200 gallons per minute and check the drawdown at 15-minute intervals until it stabilizes. Continue pumping at that rate for 2 hours and check the water level at 30 minute intervals. The pumping rate shall then be increased in uniform increments not exceeding 10 gallons per minute and the described procedure repeated at each increment of increased rate until the capacity of the well is determined. The capacity of the well shall be the flow obtained at a drawdown level 10 feet above the top of the uppermost screen. After the safe maximum yield of the well has been determined, conduct a continuous 24 hour pumping test at that rate and check the drawdown at hourly intervals. Pump data shall be submitted for approval to the Architect-Engineer firm after test information is submitted. Provide the necessary pipe and ditches to take the water away from the well site. Submit methods of disposing of the discharge to the Contracting Officer for approval. Furnish a complete written log of the test, showing static water level, pumping rate, and drawdown at the specified intervals. At the end of the 24 hour test, water samples shall be taken and tested by an approved testing laboratory for complete chemical and bacteriological analysis. Furnish additional samples in suitable containers.

6.7 Disinfection: Disinfect well, equipment, and material therein in accordance with AWWA A100. Disinfect piping in accordance with AWWA C601.

6.8 Sanitary Seal: Provide a sanitary seal for the well to prevent contamination until the pump foundation and pump are installed on the well.

7. ABANDONING EXISTING WELLS: Abandon and seal existing wells in accordance with AWWA A100 and as shown on the drawings.

8. DISPOSAL OF SOIL: Dispose of soil removed from the drilled holes by removal from the limits of Government property.

END OF SECTION

PHYSICAL AND CHEMICAL ANALYSIS OF WATER				SAMPLE NO.
FROM: (Station or unit)			DATE	
TO: (Name and location of laboratory)				
SAMPLE FROM (Location of sampling point)				
COLLECTED BY	DATE	HOUR	SOURCE (Designate ground, surface, raw, treated)	
REASON FOR EXAMINATION		EXAMINATION REQUESTED BY		
<small>NOTE All results reported in parts per million unless otherwise noted except for pH, temperature, and specific conductance. One liter of potable water is assumed to weigh one kilogram.</small>				
I. FIELD ANALYSIS			III. ROUTINE LABORATORY ANALYSIS	
1. pH	TEMPERATURE		(CHECK ONE)	
	°F	°C	REQUESTED	NOT REQUESTED
ITEM	PPM			
2. CARBON DIOXIDE (CO <sub>2</sub> )			1. COLOR	
3. DISSOLVED OXYGEN (O <sub>2</sub> )			2. TURBIDITY	
4. HYDROGEN SULFIDE (H <sub>2</sub> S)			3. ALKALINITY (CaCO <sub>3</sub> )	
5. CHLORINE DEMAND (Cl <sub>2</sub> )			P	MO
FIELD ANALYSIS BY			4. TOTAL HARDNESS (CaCO <sub>3</sub> )	
DATE OF ANALYSIS			5. NON-CARBONATE HARDNESS (CaCO <sub>3</sub> ) (By Computation)	
II. SPECIAL LABORATORY ANALYSES			6. CARBONATE HARDNESS (CaCO <sub>3</sub> ) (By Computation)	
<small>Check (X) individual items to be included in the Special Analyses. Request determination only of those substances suspected of being present in significant amounts.</small>			7. TOTAL DISSOLVED SOLIDS	
(X)	ITEM	PPM	8. SPECIFIC CONDUCTANCE (Microhm/cm)	
1. As			ITEM	
2. Se			PPM	
3. Pb			9. CALCIUM (Ca)	
4. B			10. MAGNESIUM (Mg)	
5. Cu			11. SODIUM (Na) AND POTASSIUM (K)	
6. Zn			12. HYDROXIDE (OH)*	
7. Cr (Hexavalent)			13. BICARBONATE (HCO <sub>3</sub> )*	
8. PO			14. CARBONATE (CO <sub>3</sub> )*	
9. Cd			15. SULFATE (SO <sub>4</sub> )	
10. CN			16. CHLORIDE (Cl)	
11. Phenolic Compounds (PPB)			17. NITRATE (NO <sub>3</sub> )	
12. Others (Specify)			18. IRON (Fe) TOTAL	
13.			19. MANGANESE (Mn)	
14.			20. SILICA (SiO <sub>2</sub> )	
15.			21. FLUORIDE (F)	
16.			*State whether determined or computed from P and MO alkalinity.	
REMARKS (Such as unusual appearance, taste, odor, etc.)				
LABORATORY ANALYSIS BY				DATE OF ANALYSIS

DD FORM 710  
1 APR 53

S<sub>N</sub> 0102-LF-007-2100

05-80-0399  
02581-6

SECTION 02690

PAVEMENT REMOVAL AND REPLACEMENT

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 the basic designation only.

1.1.1 American Association of State Highway and Transportation Officials (AASHTO):

- M81-75 Cut-Back Asphalt (Rapid-Curing Type)
- M82-75 Cut-Back Asphalt (Medium Curing Type)
- M140-70 Emulsified Asphalt
- M208-72 Cationic Emulsified Asphalt
- M226-78 Viscosity Graded Asphalt Cement
- T96-77 Resistance to Abrasion of Small Size  
Coarse Aggregate by Use of the Los Angeles  
Machine

1.1.2 American Society for Testing and Materials (ASTM)  
Publications:

- D977-77 Emulsified Asphalt
- D1557-78 Moisture-Density Relations of Soils and  
Soil-Aggregate Mixtures Using 10-lb (4.54 kg)  
Rammer and 18-inch (457 mm) Drop

1.1.3 North Carolina Department of Transportation and (NCDOT):

Standard Specifications for Roads and  
Structures, dated July 1, 1978

## 1.2 SUBMITTALS:

1.2.1 Certificates of Conformance or Compliance: Submit the following for approval:

- a. Base materials
- b. Asphalts and asphalt cement
- c. Bituminous Concrete Mix

1.2.2 Materials Tests and Test Reports: The testing requirements for materials incorporated in referenced documents will be waived provided the manufacturer submits certificates stating: previously manufactured materials have been tested by recognized laboratories; such materials meet testing requirements specified; and the materials furnished for this project are of the same type, quality, manufacture and make as that tested. Do not submit copies of the test reports unless specifically requested by the Contracting Officer.

## PART 2 - PRODUCTS:

### 2.1 MATERIALS:

2.1.1 Stone Base Course: NCDOT "Standard Specifications for Roads and Structures, Sections 905 and 910 for Aggregate Base Course, Standard Size No. 7. When tested in accordance with AASHTO T96, Test Grading A, aggregate shall show a loss not greater than 55 percent.

2.1.2 Bituminous Prime Coat: Grade MC-70 cut back asphalt conforming to AASHTO M82; HFMS-2 or HFMS-2h emulsified asphalt conforming to ASTM D977.

2.1.3 Bituminous Tack Coat: Grade RC-70 or RC-250 cut back asphalt conforming to AASHTO M81; Grade SS-1 emulsified asphalt conforming to AASHTO M140; CSS-1, Cationic emulsified asphalt conforming to AASHTO M208; HFMS-1, emulsified asphalt conforming to ASTM D977. The SS-1, emulsified asphalt and the CSS-1, cationic emulsified asphalt shall be diluted at the minimum on one part water to one part emulsified asphalt.

2.1.4 Bituminous Concrete: Materials and mix shall be in accordance with the NCDOT "Standard Specifications for Road and Structures", Section 645, Type I-1 or I-2 Surface Course. Asphalt cement shall be AC-20 viscosity grade conforming to AASHTO M226.

## PART 3 - EXECUTION

### 3.1 CONSTRUCTION:

3.1.1 Existing Surface Treatments: Where trenches, pits or other excavations are made in existing roadways and other areas of pavement where surface treatment of any kind exists, restore such surface treatment to the same thickness and in the same kind as previously existed, except as otherwise specified. Restored areas shall match and tie into the adjacent and surrounding existing surfaces in a neat and acceptable manner.

3.1.2 Pavement Removal: Make a straight line cut 12 inches beyond the edge of the excavation to permit proper replacement. Where bituminous concrete is overlaid on concrete paving, remove the bituminous concrete along straight lines to at least 6 inches beyond the edge of the concrete removal. Using a saw, score edges of concrete to a depth of 1.50 inches unless bounded by joints. Cut reinforcing bars or mesh through the center and bend to edge of cut to provide work clearance. At broken edge of the concrete cannot be effectively concealed in the finished work, grind the break smooth or saw cut clear through the concrete. Removed pavement, debris and soil material shall be removed from the limits of the station.

3.1.3 Backfilling and Tamping: Replace soil materials under pavement in layers not to exceed 8 inches of loose depth and compact to at least 95 percent of the maximum dry density determined in accordance with ASTM D1557, Method D.

3.1.4 Bituminous Surface: Except as otherwise specified, provide in accordance with the NCDOT "Standard Specifications for Roads and Structures". Provide a stone base course a minimum of 6 inches thick. Apply a prime coat on the base course at the rate of 0.25 gallon residual asphalt per square yard. Paint the cut edge of bituminous pavement with a bituminous tack coat and provide bituminous concrete pavement.

END OF SECTION

05-80-0399

02690-3

SECTION 02822

ESTABLISHING VEGETATION

1. SUBMITTALS:

1.1 Material Tests and Test Reports: The testing requirements for materials incorporated in referenced documents will be waived provided the manufacturer submits certificates stating that previously manufactured materials have been tested by recognized laboratories, that such materials meet testing requirements specified, and that the materials furnished for this project are of the same type, quality, manufacture and make as that tested. Copies of the test reports need not be submitted except as specifically requested by the Contracting Officer.

1.2 Certificates: Submit certificates from the manufacturer attesting that the following products conform to all requirements of this specification and of reference documents:

- |               |             |
|---------------|-------------|
| a. Fertilizer | d. Mulch    |
| b. Lime       | e. Asphalts |
| c. Seed       | f. Topsoil  |

1.2.1 Sample Certificate: The certificate shall not contain statements that could be interpreted to imply that the product does not meet all requirements specified, such as "as good as"; "achieve the same end use and results as materials formulated in accordance with the referenced specification"; "equal or exceed the service and performance of the specified material". The certificate should simply state that the product conforms to all requirements specified.

SAMPLE CERTIFICATE

The manufacturer hereby certifies that the following products being furnished for this project conform to all requirements of the project specifications and of the reference specifications listed:

MANUFACTURER AND PRODUCT

REFERENCE SPECIFICATION

John Doe Company  
Portland Cement, Type I

ASTM C150-74, Type I

SIGNATURE AND TITLE

1.3 Samples: Submit one sample of each of the following items:

- |         |          |
|---------|----------|
| a. Seed | b. Mulch |
|---------|----------|

## 2. QUALITY CONTROL:

### 2.1 Inspection and tests:

2.1.1 Seeds: Furnish duplicate signed copies of a statement from the vendor, certifying that each container of seed is fully labeled in accordance with the Seed Improvement Association requirements for certification. This certification shall appear on, or with, all copies of invoices for the seed. Each lot of seed will be subject to sampling and testing at the discretion of the Contracting Officer. Sampling and testing will be in accordance with the latest regulation under the Federal Seed Act. Samples shall be submitted at least 40 days in advance of the planned planting date.

2.1.2 Fertilizer and lime: Furnish duplicate copies of invoices for all fertilizer and lime used on the project. Invoices for fertilizer shall show the analysis and the quantity furnished. Invoices for lime shall show the percentage of magnesium oxide and quantity furnished. Upon completion of the project, a final check of the total quantities of fertilizer and lime used will be made against the total area seeded and if the rates of application have not been met, additional quantities of these materials shall be applied to make up the application specified.

## 3. MATERIALS:

3.1 Lime shall be dolomitic agricultural-ground limestone containing not less than 10 percent magnesium oxide.

3.2 Fertilizer shall be the standard commercial product of 10-10-10 analysis. All fertilizer shall be delivered in bags bearing the manufacturer's name, the chemical analysis of the product, and its weight. If not used immediately after delivery, fertilizer shall be stored in a manner that will not allow it to harden or destroy its effectiveness.

3.3 Seed shall be new crop seed labeled in accordance with the U.S. Department of Agriculture, "Rules and Regulations under the Federal Seed Act." All seed shall be furnished in sealed standard containers. Seed which has become wet, moldy, or otherwise damaged prior to seeding, will not be acceptable.

3.4 Mulch shall be any of the materials noted below:

3.4.1 Grain straw or dry hay; Mulch material which contains an excessive quantity of matured seed of noxious weed or other species which would hinder the establishment of desirable vegetation will not be acceptable. Any mulch material which is fresh or excessively brittle or which is in an advanced stage of decomposition as to smother or retard growth of grass will not be acceptable. Asphaltic material to anchor straw mulch shall be thin enough to be blown from spray equipment. It shall be SS-1, RS-1, or RS-2 asphalt emulsion.

3.4.2 Wood cellulose fiber mulch: Wood cellulose fiber mulch for use with the hydraulic application of grass seed and fertilizer shall consist of specially prepared wood cellulose fiber. It shall be processed

in such a manner that it will contain no growth or germination inhibiting factors and shall be dyed an appropriate color to facilitate metering of materials. It shall be manufactured in such a manner that after addition and agitation in slurry tanks with fertilizers, grass seeds, water, and any other approved additives, the fibers in the materials will become uniformly suspended to form a homogeneous slurry; that when hydraulically sprayed on the ground, the material will form a blotterlike ground cover impregnated uniformly with grass seed; which after application, will allow the absorption of moisture and allow rainfall or mechanical watering to percolate to the underlying soil. Suppliers shall be prepared to certify that laboratory and field testing of their product has been accomplished, and that it meets all of the foregoing requirements based upon such testing. Weight specifications of this material from suppliers, and for all applications, shall refer only to air dry weight of the fiber material. Absolute air dry weight is based on the normal weight standard of the Technical Association of the Pulp and Paper Industry for wood cellulose and is considered equivalent to 10 percent moisture. Each package of the cellulose fiber shall be marked by the manufacturer to show the air dry weight content.

3.5 Topsoil required in excess of that available from stripping topsoil from the site shall be provided by the Contractor from sources outside of Government property. The topsoil shall be natural, friable sandy loam or fine sandy loam, possessing the characteristics of producing heavy growths of agricultural crops and shall be obtained from naturally well-drained areas. The topsoil shall be reasonably free from subsoil, clay lumps, brush, stumps, objectionable weeds, other litter, and any other material or substance which might be harmful to plant growth or a hindrance to grading, planting, or maintenance operations. The topsoil proposed for use shall be inspected and approved at its natural location prior to its being moved to the construction site. At the time of inspection, the Contractor's Quality Control Representative may require representative soil samples to be taken from several locations of the areas under consideration and tested for physical properties, pH, available phosphate and potash and organic matter. If such tests are required, they shall be at the Contractor's expense.

4. GENERAL REQUIREMENTS: The work includes seedbed preparation, liming, fertilizing, seeding and mulching of all newly graded, finished earth surfaces. The work also includes those areas inside or outside the limits of construction that are disturbed by the Contractor's operation.

5. SPECIAL SEEDING AND MULCHING EQUIPMENT:

5.1 Seeder: Equipment to be used for applying a seed-fertilizer mix over prepared slopes shall be a hydraulic seeder designed to pump a water-seed-fertilizer mixture over areas to be seeded at the specified rates. A power-driven agitator keeps the mixture uniform during the seeding cycle.

5.2 Mulch Spreader: Equipment to be used for spreading mulch shall be equipment designed to apply an asphalt adhesive to the straw mulch material at the end of a movable boom, then with a high velocity air

stream, blow the asphalt-sprayed straw over the graded areas to form a uniform, porous, stable blanket, tied in place by the asphalt adhesive.

5.3 Wood cellulose fiber mulch spreader: Hydraulic equipment used for the application of fertilizer, seed, and slurry or prepared wood pulp shall have a built in agitation system with an operating capacity sufficient to agitate, suspend, and homogeneously mix a slurry containing up to 40 pounds of fiber plus a combined total of 70 pounds of fertilizer solids for each 100 gallons of water. The slurry distribution lines shall be large enough to prevent stoppage. The discharge line shall be equipped with a set of hydraulic spray nozzles which will provide even distribution of the slurry on the various slopes to be seeded. The slurry tank shall have a minimum capacity of 1,000 gallons and shall be mounted on a traveling unit which may be either self propelled or drawn with a separate unit which will place the slurry tank and spray nozzles within sufficient proximity to the areas to be seeded to as to provide uniform distribution without waste. Equipment with smaller tank capacity may be used provided that the equipment has the necessary agitation system and sufficient pump capacity to spray the slurry in a uniform coat.

6. SEEDBED PREPARATION: Equipment necessary for the proper preparation of the seedbed and for handling and placing of all required materials shall be on hand, in good condition and shall be approved before the work is started.

6.1 Clearing: Prior to or during grading and tillage operations, the ground surface shall be cleared of stumps, stones, roots, cable, wire, grade stakes, and other materials that might hinder proper grading, tillage, seeding, or subsequent maintenance operations.

6.2 Grading: Grades on the area to be treated shall be maintained in a true and even condition. Maintenance shall include any necessary repairs to previously graded areas.

6.3 Tillage: All graded areas shall be thoroughly tilled to a depth of at least 4 inches by plowing, disking, harrowing, or other approved methods until the condition of the soil is acceptable on sites where soil conditions are such that high clay content and excessive compaction cause difficulty in getting clods and lumps effectively pulverized, the Contractor shall use the rotary tillage machinery, until the mixing of the soil is acceptable and no clods or clumps remain larger than 1 1/2 inches in diameter. A firm and compact seedbed is required, and after being graded, the seedbed shall be lightly compacted with a land roller, such as a cultipacker, before and after seeding. All tillage operations shall be as near on the contour as is practical but in no instance up and down the slope.

6.4 Topsoiling: The topsoil shall be uniformly distributed on the designated areas and evenly spread to an average thickness of 4 inches, with a minimum thickness of 3 inches. Prior to placing the topsoil, the subgrade, wherever excessively compacted by traffic or other causes, shall be loosened by disking or by scarifying to a depth of at least 2 inches, to permit bonding to the subgrade. The spreading shall be performed in such a manner that planting can proceed with little

additional soil preparation or tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions where water will stand. Topsoil shall not be paced when the subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to the planting or to proper grading.

7. LIMING: Limestone shall be uniformly applied at the rate of 3,000 pounds per acre to all areas to be vegetated. Limestone may be applied to the area prior to the preparation of the seedbed, but in all cases, it shall be applied before seeding and thoroughly incorporated into the entire depth of the prepared seedbed. The incorporation of the lime may form a part of the tillage operation specified above.

8. FERTILIZING: The fertilizer shall be uniformly applied at the rate of 1,000 pounds per acre to all areas to be vegetated. The fertilizer shall be incorporated into the upper three or four inches of prepared seedbed. This can be done just prior to the last tillage operation or just prior to seeding, but in no case, will it be applied more than 3 days before seeding or before the lime is applied. Distribution by means of an approved seed drill equipped to sow seed and distribute fertilizer at the same time will be acceptable. When hydroseeding equipment is used for planting operation, fertilizer shall be applied simultaneously with seed using the above rate of application.

9. SEEDING: The Contractor shall make use of special hydroseeding equipment of approved mechanical power-drawn seeders. When conditions are such, by reason of draught, high winds, excessive moisture, or other factors that satisfactory results are not likely to be obtained, the work shall be stopped, and resumed only when conditions are favorable.

If inspection during seeding operation, or after there is a show of green, indicates that strips wider than the space between the rows planted have been left, or other areas skipped, additional seed shall be sown on these areas. Seed shall be sown on these areas. Seed shall be sown between March 1 and May 1 or between September 1 and October 1. Spring seeding shall be at the rate of 100 pounds per acre of the following seed mixture:

<u>Variety</u>	<u>Pounds</u>
Kentucky 31 Tall Fescue	80
Coastal Bermuda	20

Fall seeding shall be at the rate of 120 pounds per acre of the following seed mixture:

<u>Variety</u>	<u>Pounds</u>
Kentucky 31 Tall Fescue	100
Coastal Bermuda	20

NOTE: The variety of seeds indicated shall be sown only during the optimum periods specified.

9.1 Broadcast Seeding: In areas too confined for the operation of machinery, hand-operated equipment, such as the "Cyclone" seeder, shall be employed. The seed shall be uniformly distributed over the designated areas. Half the seed shall be sown with the sower moving in one direction, and the remainder shall be sown with the sower moving at right angles to the first sowing. In confined areas, the seed shall be covered, but no deeper than 1/4 inch, by means of rakes or other approved hand tools. Broadcast seeding shall not be done during windy weather.

9.2 Slurry seeding: Seed shall be sown with an approved hydroseeder in combination with fertilizer, or in combination with wood cellulose fiber mulch and fertilizer. Seed shall be uniformly distributed over the areas to be seeded.

9.3 Mechanical power-drawn seeder: Seeding shall be accomplished with a combination grass planter and land packer or pulverizer. The seed shall be planted no deeper than 1/4 inch. The seeding operation should be as near on the contour as is practical, but never up and down the slope. After seeding, the seeded area shall be compacted with a land roller, such as a cultipacker. It will be permissible to sow the seed and cultipack the soil all in one operation if the proper equipment is used.

10. MULCHING: The surface of all seeded areas shall be protected by the application of any of the before-mentioned mulch material unless otherwise specified.

10.1 Straw or hay shall be applied evenly over the seeded area in such a manner that thickness of the mulch is approximately uniform throughout the treated area and sunlight is not completely excluded from penetration to the ground surface. The straw mulch shall be applied at the rate of one and one-half tons per acre.

10.2 Wood cellulose fiber mulch: The application of the wood cellulose fiber mulch shall be with the hydroseeder and shall be accomplished immediately after completion of the final tillage operation. The wood cellulose fiber mulch shall be applied at the rate of 1,000 pounds per acre in combination with water, fertilizer and seed and shall be sprayed over the soil in a uniform coat.

10.3 Anchoring mulch: Straw or hay mulch shall be anchored in place by use of a cut-away rolling flat disk packer or by uniformly spraying the straw with the specified asphalt material at the rate of 0.10 gallon residual asphalt per square yard.

11. PROTECTION: The area shall be protected against foot and vehicular traffic by erecting adequate barricades immediately after seeding is completed, and by placing warning signs of an approved type.

12. ESTABLISHMENT: The Contractor shall be reasonable for the proper care of the seeded area during the period when the vegetation is being established. In the event of an erosive rain before an adequate stand of vegetation is established, damaged areas shall be repaired, limed, fertilized, seeded, and mulched wholly at the Contractor's expense. This period shall extend for 30 days after the completion of the mulching.

13. POSTPONEMENT OF SEEDING: If upon completion of the finish grading, the seeding cannot be completed during the specified periods, then the seeding shall be accomplished during the next seeding period specified. Only an amount considered sufficient by the Contracting Officer to cover payment for this work will be withheld from the progress payments. The beneficial occupancy of the facility shall not be delayed by the postponement of the seeding.

END OF SECTION

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SECTION 03302  
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publication listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1.1.1 Federal Specifications (Fed. Spec.):

QQ-S-775E Steel Sheets, Carbon, Zinc-Coated  
& Int. Am 1 (Galvanized) by the Hot Dip Process

1.1.2 U.S. Department of Commerce Product Standard (PS)  
Publication:

1-74 Construction and Industrial Plywood

1.1.3 American Concrete Institute (ACI) Publications:

211.1-77 Recommended Practice for Selecting  
Proportions for Normal and Heavyweight  
Concrete

304-73 Recommended Practice for Measuring,  
Mixing, Transporting and Placing Concrete

315-74 Manual of Standard Practice for Detailing  
Reinforced Concrete Structures

318-77 & Building Code Requirements for Reinforced  
77C Suppl. Concrete

347-77 Recommended Practice for Concrete Formwork

1.1.4 American Iron and Steel Institute (AISI) Publication: output  
86 play Cold-Formed Steel Design Manual, 1968 edition.

1.1.5 American Society for Testing and Materials (ASTM)  
Publications:

A 185-79 Welded Steel Wire Fabric for Concrete  
Reinforcement

A 615-78 Deformed and Plain Billet-Steel Bars for  
Concrete Reinforcement

C 31-69 (R 1975)	Making and Curing Concrete Test Specimens in the Field
C 33-79	Concrete Aggregates
C 39-72 (R 1979)	Compressive Strength of Cylindrical Concrete Specimens
C 94-78	Ready-Mixed Concrete
C 143-78	Slump of Portland Cement Concrete
C 150-78	Portland Cement
C 171-69 (R 1975)	Sheet Materials for Curing Concrete
C 172-71 (R 1977)	Sampling Fresh Concrete
C 231-78	Air Content for Freshly Mixed Concrete by the Pressure Method
C 260-77	Air-Entraining Admixtures for Concrete
C 309-74	Liquid Membrane-Forming Compounds for Curing Concrete
D 98-77	Calcium Chloride
D 1190-74	Concrete Joint Sealer, Hot Poured Elastic Type
D 1751-73 (R 1978)	Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
D 1752-67 (R 1978)	Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
D 1850-74	Concrete Joint Sealer, Cold Application Type

## 1.2 SUBMITTALS:

1.2.1 Catalog Data: Submit complete descriptive literature for each type of expansion joint filler and joint sealer. Clearly mark data to indicate which type, size, or item the Contractor intends to provide. Data shall be sufficient to show conformance to specified requirements.

1.2.2 Contractor Mix Design: Submit for approval a mix design for each type of concrete, including a complete list of materials and the applicable reference specifications, and copies of test reports showing that the mix has been successfully used to produce concrete with the properties specified.

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1.2.3 Shop Drawings: Submit shop drawings for reinforcing steel, prepared in accordance with ACI 315. Indicate bending diagrams, assembly diagrams, splicing and laps of rods, and shapes, dimensions and details of bar reinforcing and accessories. Do not use scaled dimensions from structural drawings to determine lengths of reinforcing rods.

1.2.4 Certification: Submit one copy of the delivery ticket for each load of ready-mixed concrete, showing all information required by ASTM C 94.

1.3 DELIVERY AND STORAGE: Do not deliver concrete until forms, reinforcement, and embedded items are in place and ready for concrete to be placed. Store reinforcement in a manner that will avoid excessive rusting or coating with grease, oil, dirt, and other objectionable materials. Store in separate piles or racks so as to avoid confusion or loss of identification after bundles are broken.

## PART 2 - PRODUCTS

### 2.1 CONCRETE:

2.1.1 Contractor Furnished Mix Design: Design concrete mix in accordance with ACI 211.1 Slump shall be between 2 inches and 4 inches. The concrete shall have a 28-day compressive strength of 3000 pounds per square inch and a maximum aggregate size of 1 inch.

2.1.2 Air-Entrained Concrete: Provide for all concrete exposed to the weather. Accomplish air-entrainment by using an air-entraining admixture, not air-entraining cement. If the entrained air content falls below the specified limit, add a sufficient quantity of admixture to bring the entrained air content within the specified limits. Dissolve the admixture in a portion of the mixing water and add to the mix in the drum in a manner that will ensure uniform distribution of the agent throughout the batch. The air content of freshly mixed air-entrained concrete shall be as follows:

<u>Maximum aggregate size</u>	<u>Amount of air (percent volume of concrete)</u>
3/4 inch or one inch	6 plus or minus one

Determine percentage of air in accordance with ASTM C 231 on samples taken during placing of the concrete in the forms.

### 2.2 MATERIALS:

2.2.1 Cement: ASTM C 150, Type I or II for all concrete. All cement for exposed concrete surfaces shall be of the same manufacture.

2.2.2 Water: Water, including free moisture and water in the aggregates, shall be fresh, clean and potable. Turbidity of the water shall not exceed 2,000 parts per million.

2.2.3 Aggregates: ASTM C 33, size no. 57 or 67, except as modified herein. Obtain all aggregates for exposed concrete surfaces from one source. Aggregates shall be free from any substance which may be deleteriously reactive with the alkalis in the cement.

2.2.4 Admixtures:

2.2.4.1 Air-entraining: ASTM C 260, for all concrete specified to be air-entrained.

2.2.4.2 Accelerating: ASTM D 98, Type I or Type II. Use only when specifically approved by the Contracting Officer.

2.2.5 Reinforcement:

2.2.5.1 Reinforcing Bars: ASTM A 615, Grade 60. All except number 2 bars shall be deformed.

2.2.5.2 Welded Wire Fabric: ASTM A 185, 6 by 6 - W2.9 by W2.9, unless otherwise indicated.

2.2.6 Materials for Curing Concrete:

2.2.6.1 Impervious Sheeting: Waterproof paper, polyethylene sheeting, or polyethylene coated burlap conforming to ASTM C 171.

2.2.6.2 Liquid Membrane-forming Compound: ASTM C 309, white-pigmented, Type 2, free of paraffin or petroleum.

2.2.6.3 Liquid Chemical Compound: A suitable sealer-hardener designed for sealing and hardening in addition to curing of the concrete, applied by the method and at the rate recommended by the manufacturer. It shall not reduce the adhesion of tile, paint, roofing, waterproofing or other material to be applied to the concrete. The chemical compound shall be free of petroleum resins to waxes.

2.2.7 Joint Sealing Materials: ASTM D 1190 or D 1850 inside buildings; D 1190 outside of buildings.

2.2.8 Preformed Joint Filler: ASTM D 1751 or D 1752.

2.2.9 Vapor Barrier Material: Polyethylene sheeting of not less than 6-mil nominal thickness.

2.3 FORMS:

2.3.1 General: Provide forms for all concrete not indicated or specified otherwise. Set forms true to line and grade and maintain so as to insure completed work within the allowable tolerances specified, and make mortar-tight. The Contractor shall be responsible for the adequacy of forms and form supports. Construct forms so that they can be removed without damaging the concrete. Chamfer all exposed joints, edges, and external corners of concrete 3/4 inch unless otherwise indicated.

2.3.2 Materials for Forms: Wood, plywood, steel, or other suitable material. Wood forms, for surfaces exposed to view in the finished structure, shall be boards or plywood. Dress boards to a uniform thickness, evenly match, and provide boards free from loose knots, holes, and other defects. Plywood shall be B-B concrete form panels conforming to PS-1. Surfaces of steel forms shall be free from irregularities, dents, and sags.

2.3.3 Coating: Before placing the concrete, coat the contact surfaces of forms with a non-staining mineral oil, non-staining form coating compound, or two coats of nitro-cellulose lacquer. Do not use mineral oil on forms for surfaces which are to be painted.

2.3.4 Tolerances and Variations: Set and maintain concrete forms to ensure that after removal of the forms no portion of the concrete work will exceed any of the tolerances specified in ACI 347.

### PART 3 - EXECUTION

#### 3.1 PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS:

3.1.1 General: Provide all bars, wire fabric, and other reinforcing materials as indicated or specified, together with all necessary wire ties, supports, and other devices necessary to install and secure the reinforcement properly. All reinforcement, when placed, shall be free from rust, scale, oil, grease, clay, and other coating, and foreign substances that would reduce or destroy the bond. Rusting of reinforcement shall not be a basis of rejection, provided that the rusting has not reduced the effective cross sectional area of the reinforcement, and provided that loose rust shall be removed prior to placing. Detailing of reinforcing shall conform to ACI 315. Where cover over reinforcing steel is not indicated, it shall be in accordance with ACI 318.

3.1.2 Placing: Place reinforcement accurately and secure in place on suitable chairs, spacers, or metal hangers. On the ground, use concrete or other non-corrodible material for supporting reinforcement.

3.1.3 Splicing: Conform to ACI 318, except as otherwise indicated or specified. Where splices in addition to those indicated are necessary, they shall be approved by the Contracting Officer prior to their use. Do not make splices at points of maximum stress. Make splices in welded wire fabric so that the overlap is not less than the spacing of the cross wires.

3.1.4 Setting Miscellaneous Material: Place and secure anchors and bolts, pipe sleeves, conduits, and other such items in position before the concrete is placed. Plumb anchor bolts, check for location and elevation, and secure rigidly in position. Fill voids in sleeves temporarily with readily removable material to prevent the entry of concrete into the voids.

3.1.5 Vapor Barrier: Provide beneath the entire concrete floor slab of the building. Use the greatest widths and lengths practicable so as to eliminate joints wherever possible. Where joints are necessary, lap not less than 6 inches and seal with approved adhesive. Torn, punctured, or damaged vapor barrier material shall be removed and

replaced as directed, prior to the placing of concrete. Place concrete to preclude damage to the vapor barrier material.

3.1.6 Expansion Joints and Cleavage Joints: Make joints a 1/2-inch wide except as indicated otherwise. Fill expansion joints not exposed to weather completely, and fill joints exposed to weather to a depth of one inch from the surface, with preformed joint material. Clean the one-inch deep space above the preformed material after the concrete has been cured and, when dry, fill flush with joint sealing material. Do not extend reinforcement or other embedded metal items bonded to the concrete through any expansion joint.

3.2 MEASURING MIXING, TRANSPORTING AND PLACING CONCRETE: Shall be in accordance with ACI 304, except as modified herein.

3.2.1 Conveying: Convey concrete from the mixer to the forms as rapidly as practicable and so as not to cause segregation or loss of ingredients. Deposit concrete as nearly as practicable in its final position in the forms. At any point in the conveying, the free vertical drop of the concrete shall not exceed 3 feet. Clean conveying equipment thoroughly before each run. Do not use aluminum pipe or chutes. Place concrete as soon as practicable after the forms and the reinforcement have been inspected and approved. Concrete which has segregated in conveying shall be removed and disposed of as directed.

3.2.2 Measuring: Make moisture, volumetric, and air determinations at intervals specified hereinafter under testing requirements. Allowable tolerances for measuring cement and water shall be one percent; for aggregates, 2 percent; and for admixtures, 3 percent.

3.2.3 Mixing: Machine mix all concrete. Begin mixing within 30 minutes after the cement has been added to the aggregates. Introduce all mixing water in the drum before one-fourth of the mixing time has elapsed. The time elapsing between the introduction of the mixing water to the cement and aggregates or the cement to the aggregates and placing of the concrete in final position in the forms shall not exceed 60 minutes if the air temperature is less than 85 degrees Fahrenheit (degrees F), and 45 minutes if the air temperature is equal or greater than 85 degrees F. The retempering of concrete, i.e., remixing with or without additional cement, aggregate, or water, will not be permitted.

3.2.4 Placing: Do not place concrete when weather conditions prevent proper placement and consolidation. Do not place concrete in uncovered areas during periods of precipitation. Do not place concrete in water. Prepare subgrades of earth or other material properly and, if necessary, cover with heavy building paper or other suitable material to prevent the concrete from becoming contaminated. Dampen porous subgrades as required to prevent water of hydration from being absorbed into the subgrade. Clean forms of dirt, construction debris, water, snow, and ice. Place concrete in one continuous operation except where construction joints are provided. Place concrete in areas bounded by construction joints in one continuous operation. Remove water which

accumulates on the surface of the concrete during placing by absorption with porous materials in a manner that prevents removal of cement.

3.2.5 Vibration: Compact all concrete, with the exception of concrete slabs 4 inches or less in depth, with high frequency, internal, mechanical vibrating equipment supplemented by hand spading and tamping. Consolidate concrete slabs 4 inches or less in depth by wood tampers, spading, and settling with a heavy leveling straight edge. Vibrators shall be designed to operate with vibratory element submerged in the concrete, and shall have a frequency of not less than 6,000 impulses per minute when submerged. Discontinue vibration when the concrete has been compacted thoroughly and ceases to decrease in volume.

3.2.6 Ready-Mixed Concrete: ASTM C 94 as modified herein. "Ready-mixed concrete" shall mean concrete produced regularly by a commercial establishment and delivered to the purchaser in the plastic state. The cement, aggregates, water and admixtures shall conform to all applicable requirements of this specification.

3.2.7 Cold Weather: Except when authorized specifically by the Contracting Officer, do not place concrete when the atmospheric temperature is below 40 degrees F or when the concrete is likely to be subjected to freezing temperatures within 24 hours. When so authorized, if concrete is likely to be subjected to freezing within 24 hours after placing, heat concrete materials so that the temperature of the concrete when deposited shall be between 65 and 80 degrees F. Methods of heating materials shall be subject to approval of the Contracting Officer. Do not heat mixing water above 165 degrees F. Remove lumps of frozen material and ice from the aggregates before placing aggregates in the mixer. When specifically approved by the Contracting Officer, the Contractor may add, at no additional cost to the Government, not more than 2 pounds of Type I or not more than one pound 10 ounces of Type II calcium chloride, ASTM D 98, per bag of cement. Dissolve the admixture in a portion of the mixing water and add to the mix at the drum in a manner that will ensure uniform distribution of the agent throughout the batch. Remove and replace concrete damaged by freezing with new.

3.2.8 Hot Weather: Reduce the temperature of the concrete being placed and prevent rapid drying of newly placed concrete. When the outdoor ambient temperature is more than 90 degrees F, the temperature of the concrete as placed shall not exceed 90 degrees Fahrenheit; shade the fresh concrete as soon as possible after placing; and start curing as soon as the surface of the fresh concrete is sufficiently hard to permit curing without damage to the concrete.

### 3.3 SURFACE FINISHES (EXCEPT FLOOR AND SLAB FINISHES):

3.3.1 General: Repair all formed surfaces by patching minor honeycombed or otherwise defective areas with cement mortar of the same composition as that used in the concrete. Patch concrete as soon as the forms are removed. Concrete with excessive honeycombing or other defects which affect the structural strength of the member, will be rejected, or the defects corrected as directed by the Contracting Officer.

3.3.2 Standard Finish: Provide standard finish for exposed concrete not indicated or specified otherwise. The surface of the concrete shall not vary more than 1/4 inch when measured from a five-foot template. Exposed surfaces shall be uniform in appearance.

3.3.2.1 Against Forms: Remove fins and other projections and level abrupt irregularities. Fill surface pits having a dimension greater than 1/8 inch with cement mortar as specified.

3.3.2.2 Not Against Forms: Finish surfaces not otherwise specified with wood floats to even surfaces.

### 3.4 FLOOR AND SLAB FINISHES:

3.4.1 General: Interior floor slabs shall receive a steel trowelled finish. Interior slabs which do not receive floor covering shall receive a sealer-hardener finish. Exterior concrete slabs shall receive a broom finish. Do not place dry cement directly upon the new concrete surface to absorb excess moisture.

3.4.2 Finishing: Place, consolidate and immediately strike off concrete to bring the top surface of the slab to proper contour, grade and elevation. Immediately darby or bull float the surface with wooden tools so as to correct any unevenness. Complete striking-off and darbying before bleed water appears on the surface of the freshly-placed concrete. Permit the concrete to attain a set sufficient for floating and sufficient to support the weight of the finisher and equipment. If the bleed water has not disappeared by the time floating of the surface is to start, drag the excess water off using a rubber hose. Do not use dry cement to absorb bleed water.

3.4.2.1 Floated finish: At the proper time, float the surface by hand with a wood or magnesium float, or by a power-driven float. Floating of any one area shall be the minimum necessary to produce an even finish, level within 1/4 inch in 10 feet.

3.4.2.2 Troweled Finish: First, provide a floated finish. When slab has attained a proper set, hand or machine-trowel to a smooth, hard, dense finish, level within 1/8 inch in 10 feet.

3.4.2.3 Broomed Finish: Provide a floated finish and a steel troweled finish, as specified hereinbefore, and then broom with a flexible bristle broom. At time of brooming the troweled surface shall have hardened sufficiently to retain the scoring or ridges. Broom in a direction transverse to that of traffic or at right angles to the slope of the slab.

### 3.5 CURING AND PROTECTION:

3.5.1 General Requirements: Protect concrete adequately from injurious action by sun, rain, flowing water, frost, and mechanical injury, and do not allow it to dry out from the time it is placed until the expiration of the minimum curing periods specified hereinafter. Use impervious-sheeting curing, liquid chemical or liquid membrane-forming

compound, except as specified otherwise herein. Do not use membrane-forming compound on surfaces where its appearance would be objectionable, on any surface to be painted, where coverings are to be bonded to the concrete, or on concrete to which other concrete is to be bonded. Begin curing immediately following the removal of forms. Maintain the temperature of the air next to the concrete at not less than 40 degrees F for the full curing periods.

3.5.2 Impervious-Sheeting Curing: Wet the entire exposed surface thoroughly with a fine spray of water and then cover with impervious sheeting. Lay sheets directly on the concrete surface and overlap 12 inches. Make sheeting not less than 18 inches wider than the concrete surface to be cured, and weight down on the edges and over the transverse laps to form closed joints. Repair or replace sheets if torn or otherwise damaged during curing. The sheeting shall remain on the concrete surface to be cured for not less than 7 days.

3.5.3 Liquid Membrane-Forming Compound Curing: Seal or cover all joint openings prior to application of the curing compound to prevent the curing compound from entering the joint. Compound shall remain on the concrete for 7 days before sealer or covering is removed and joint sealing material is placed in the joints.

3.5.3.1 Application: Apply the compound immediately after the surface loses its water sheen and has a dull appearance and before joints are sawed. Agitate curing compound thoroughly by mechanical means during use and apply uniformly in a two-coat continuous operation by suitable power-spraying equipment. The total coverage for the two coats shall be between 150 and 200 square feet per gallon of undiluted compound. The compound shall form a uniform, continuous, coherent film that will not check, crack, or peel and shall be free from pinholes or other imperfections. Apply an additional coat of the compound immediately to areas where the film is defective. Respray concrete surfaces that are subject to heavy rainfall within 3 hours after the curing compound has been applied in the same manner.

3.5.3.2 Protection of Treated Surfaces: Keep concrete surfaces to which liquid membrane-forming compounds have been applied free from foot and vehicular traffic and other sources of abrasion for not less than 72 hours. Maintain continuity of the coating for the entire curing period and repair damage to the coating during this period immediately.

3.5.4 Liquid Chemical Compound Curing: Provide for surfaces for which a sealer-hardener finish is specified and at the Contractor's option, provide in lieu of liquid membrane-forming compound curing. The application of the compound shall conform to the requirements for liquid membrane-forming compound curing except as specified otherwise herein. Sealing or covering of joints and openings in which joint sealer is to be applied will not be required. The coverage and number of applications shall be in accordance with the recommendations of the manufacturer of the compound.

3.5.5 Curing Periods: Cure not less than 10 days for concrete exposed to the weather and not less than 7 days for all other concrete.

3.5.6 Removal of Forms: Remove forms in a manner which will prevent damage to the concrete. Do not remove forms without approval, nor sooner than 24 hours after placement of concrete.

### 3.6 MISCELLANEOUS CONSTRUCTION:

3.6.1 Splash Blocks: Provide at outlets of downspouts emptying at grade. Splash blocks shall be of precast concrete, 24-inches long, 12-inches wide, and 6-inches thick, unless otherwise shown, with countersunk dishes finished smooth and sloped to drain away from the building. Compact the earth to provide firm bases for the blocks.

### 3.7 SAMPLING AND TESTING:

3.7.1 Sampling: Collect samples of fresh concrete in accordance with ASTM C 172 during each working day as required to perform all tests specified herein. Make test specimens in accordance with ASTM C 31.

#### 3.7.2 Testing:

3.7.2.1 Consistency Tests: Determine slump in accordance with ASTM C 143. Take samples for slump determination from the concrete while it is being placed. Make tests at the beginning of a concrete placement operation and at subsequent intervals to insure that the specification requirements are met. In addition, make tests each time test cylinders are made.

3.7.2.2 Compressive Tests: Determine compressive strength in accordance with ASTM C 39. Make four test specimens for each set of tests. Test two specimens at 7 days, and the other two at 28 days. The strength level of the concrete will be considered satisfactory if the average of the 28-day test results equals or exceeds the specified 28 day compressive strength, and no individual strength test falls below the required 28 day compressive strength by more than 300 pounds per square inch. Where strength level of concrete falls below the specified limits, the Government may order core samples taken, and tested, at the Contractor's expense. In such event, three core samples for each cylinder test indicating defective concrete shall be taken for further testing. Sampling, testing and evaluation of drilled cores shall be in accordance with ACI 318, Part 3, Chapter 4. Concrete which is determined to be defective based on the strength acceptance criteria therein shall be removed and replaced with acceptable concrete. Frequency of compressive tests on concrete cylinders shall be not less than four test cylinders for each day for each class of concrete placed that day.

3.7.2.3 Air Content: Test air-entrained concrete for air content at the same frequency as specified for slump tests.

3.7.3 Contractor Furnished Mix Design: If test results of any concrete used in the project show that the concrete strength is below the specified limits and does not meet other requirements of this specification, the Contractor shall make all necessary adjustments. Remove concrete which at the end of 60 days after placement does not meet the specified strength and replace with new, or otherwise correct.

END OF SECTION

SECTION 13121

PRE-ENGINEERED METAL BUILDINGS

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 the basic designation only.

1.1 Federal Specifications (Fed. Spec.):

- RR-D-575B Door, Metal, Sliding and Swinging: Door Frame, Metal (Flush and Semiflush)
- TT-C-520B Coating Compound, Bituminous, Solvent Type, Underbody, (For Motor Vehicles)
- TT-C-1796A Calking Compounds, Metal Seam and Wood Seam
- TT-P-645 Primer, Paint, Zinc-Chromate, Alkyd Type

1.2 Military Specifications (Mil. Spec.):

- MIL-S-4174B Steel Sheet and Strip, Flat, Aluminum Coated, Low Carbon
- DOD-P-15328D Primer (Wash), Pretreatment (Formula No. 117 for Metals) (Metric)

1.3 American Institute of Steel Construction (AISC) Publication:

Steel Construction Manual (Seventh Edition)

1.4 American Iron and Steel Institute (AISI) Publication:

Cold-Formed Steel Design Manual, (1968 Edition, and Including Addendum No. 1)

1.5 American Society for Testing and Materials (ASTM) Publications:

- A446-76 Steel Sheet, Zinc-coated (Galvanized by the Hot Dip Process, Structural (Physical Quality)

- B117-73 Salt Spray (Fog) Testing
- D822-60 Operating Light-and Water-exposure  
(R-1973) Apparatus for Testing Paint, Varnish,  
Lacquer and Related Products
- E84-77 Test for Surface Burning Characteristics  
of Building Materials
- E96-66 Water Vapor Transmission of Materials in  
(R-1972) Sheet Form
- E330-70 Tests for Structural Performance of  
Exterior Window Curtain Walls, and  
Doors Under the Influence of Wind Loads

1.6 Metal Building Manufacturers Association (MBMA) Publication:

Recommended Design Practices Manual, (1974 Edition)

1.7 Aluminum Association (AA) Publication:

Designation System for Aluminum Finishes, Sixth  
Edition, March 1973

1.8 American National Standards Institute (ANSI) Publications:

A156.1-1976 Butts and Hinges (BHMA 101)

A156.2-1976 Locks and Lock Trim (BHMA 601)

A156.4-1972 Door Controls (Closers) (BHMA 301)

2. SUBMITTALS:

2.1 Descriptive Data: Submit for approval descriptive data on all materials to be provided under this section. Data shall be sufficient to indicate conformance to all specified requirements.

2.2 Erection Instructions and Diagrams: Instructions and diagrams as necessary to erect the building and install all components shall be submitted for approval and shall contain, but not be limited to, the following:

- a. Anchor bolt layouts and sizes
- b. Structural connections
- c. Roofing and siding connections
- d. Joint sealing and caulking
- e. Door and window frame installation
- f. Flashings
- g. Accessory installation
- h. All details and instructions necessary for complete assembly
- i. Shop drawings as necessary to supplement the instructions and drawings if required for the proper erection and installation of the building and components.

2.3 Certificates of Conformance or Compliance: Submit certificates from the manufacturer attesting that all materials conform to all requirements of this specification and of referenced documents.

2.4 Colors: Submit one sample of each color indicated for verification that products match the color indicated. Where colors are not indicated, submit not less than eight different samples of manufacturer's standard colors for selection by the Contracting Officer.

2.5 Design Calculations: Submit for approval the engineering design calculations and stress diagrams for both roof and wall structural panels.

3. DELIVERY AND STORAGE: Prefabricated components, panels, and other manufactured items shall be delivered, stored, handled, and erected in such a manner that they will not be damaged or deformed. Materials stored on the site before erection shall be stacked on platforms or pallets and covered with tarpaulins or other suitable weathertight covering. All metal sheets or panels shall be stored so that water which might have accumulated during transit or storage will drain off; the sheets or panels shall not be stored in contact with materials that might cause staining. Upon arrival on the job site, the sheets or panels shall be inspected; if found wet, the moisture shall be removed and the sheets or panels shall be restacked and protected until used.

4. DESIGN REQUIREMENTS: MBMA Recommended Design Practices Manual except as specified otherwise herein.

4.1 Normal Design Loads: As indicated. The vertical live loads, in addition to the applicable dead loads, shall be applied on the horizontal projection of the roof structure. The wind load on the building shall be proportioned and applied as horizontal and uplift velocity pressures. The

maximum deflection in roofing or roof panels shall not exceed 1/180th of their spans, and the maximum deflection in siding or wall panels shall not exceed 1/90th of their spans.

4.2 Auxiliary Loads: Superimposed dynamic and/or static loads shall be applied in addition to the normal design loads and shall be considered in combinations with normal design loads.

5. DESCRIPTION OF BUILDINGS: Self-framing type in which the roof covering (panels) provide the structural supporting system. The wall and roof panels shall combine both the structural support and covers in one basic unit. These units, securely fastened together, shall sustain the applicable live and wind loads. If panels are omitted for any reason, the structural stability must be replaced by using supplementary framing. Framed openings for accessories, such as doors, windows, etc. shall be designed to structurally replace the panels they displace.

Live load shall be carried by the roof panels acting as either beams or rafters, with the vertical load supported by the sidewall panels acting as columns.

Wind load on the sidewalls shall be carried by the wall panels; one-half (1/2) of the load transferred directly to the wall base and into the foundation. The remaining half (1/2) is transmitted to the eave and thence into the roof panels. The roof panels shall act as a diaphragm in carrying the wind load to the sidewalls. Wind load on the end walls shall be similarly transmitted to the sidewalls. The walls shall provide the backing resistance to transfer the load to the wall base and into the foundation.

Roof slope shall be not less than that indicated. Roof slope greater than that indicated may be furnished if all additional materials required because of the greater slope are provided and drawings are submitted for approval indicating all changes required due to the increased slope.

6. MATERIALS: MBMA Recommended Design Practices Manual except as specified otherwise herein. Roof and wall coverings, accessories and flashings shall be of such design and shall be installed so that they shall be completely weathertight, free of abrasions, loose fasteners, and deformations. Furnish in writing, one year warranties providing for repairs to roof and wall coverings, accessories and flashings. Correct all leaks occurring within one year from the date of acceptance by the Government.

6.1 Minimum Thickness: Materials shall be of thickness necessary to conform to design requirements but in addition shall conform to the following:

ITEMS	MINIMUM THICKNESS (UNCOATED)
Steel Structural Members other than Wall and Roof Covering	18 MFG STD (Manufacturers Standard) gage
Roof and Wall Covering	
Steel	24 MFG STD gage
Aluminum	0.032 inch
Plastic	0.045 inch
Gable and Eave Trim, Fascia Closure Strips, Rake Flashings, Copings and Liner Panels	
Steel	26 MFG STD gage
Aluminum	0.032 inch
Plastic	0.045 inch
Louvers	
Steel	18 MFG STD gage
Aluminum	0.064 inch

6.2 Roof and Wall Coverings: Fabricated of zinc-coated steel and aluminum-coated steel except as specified otherwise. Roof and wall coverings shall be of preformed panels. Configurations of the panels shall closely approximate the configuration of the panels indicated. Depth of the panels shall be as indicated. Panels shall consist of an inner and outer zinc-coated steel sheet formed and joined at edges into a tongue-and-groove joining system which are equipped with vinyl seals or factory applied non-skinning butyl sealant to provide a water and weather tight joint upon installation. Insulation shall be provided in the cores of the panels as necessary to provide an overall "U" value of not more than 0.21. Insulation shall have a flame spread rating of 50 or less and a smoke development factor of 100 or less when tested in accordance with ASTM E84.

6.3 Liner Panels: Formed of same type material as used for wall panels to closely approximate configuration of panels indicated.

6.4 Sheet Metal Accessories: Of same material and finish as used for adjacent wall or roof covering except as specified otherwise herein.

6.4.1 Caps, Strips and Plates: Eave and edge strips, miscellaneous flashings, and miscellaneous sheet metal accessories, unless specified otherwise herein, shall be formed from the same material and gage as the roof covering. Wall plates, base angles or base channels, and other miscellaneous framing members may be standard structural steel shapes, or they may be formed from steel not lighter than 18-gage.

6.4.2 Fixed Blade Louvers: Louvers and frames shall be of the sizes and design indicated. Blades shall be folded or beaded at the edges, set at an angle that will exclude driving rains, and firmly secured to the frames by riveting or welding, whichever is standard with the manufacturer. Mullions shall be provided for louvers 4 feet and more in width; not less than one mullion shall be provided for each 4-foot width. Flanges shall be provided on the interior face of frames where air intakes

and/or exhaust louvers are indicated to be connected with a combination gravity-manually operated dampers which can be locked in the open position and/or metal ductwork. Woven wire bird screening, not less than 3 by 3 mesh per square inch in rewirable frames, shall be provided on the interior of louvers; screen frames shall be installed by means of clips in such a manner that they can be removed readily for cleaning and rewiring. The screens and frames shall be of the same type metal as the louvers; screen wire shall be not less than 0.0475 inch in diameter.

6.5 Closure Strips: Formed of approved compressed rubber, synthetic rubber, bituminous impregnated materials, or metal of the same respective type as the roof and wall panels, and as standard with the manufacturer. Molded closure strips shall be free of open voids and shall not absorb or retain water. Closure strips shall be formed to match the corrugations or configurations of the roofing or siding being used and shall be provided where indicated and where necessary to provide weathertight construction.

6.7 Joint Sealing Material: All side and end laps shall be sealed with Type II, Class B ribbon form sealant conforming to Fed. Spec. TT-C-1796, except that bituminous type materials shall not be used. Minimum sizes of ribbons shall be 3/32-inch by 1/2-inch for rectangular areas and 1/4-inch diameter for circular areas. All joints at doors, windows, accessories, and flashings shall be sealed in a manner similar to the sealing of sheets and panels.

6.8. Fasteners: Fasteners for attachment to structural supports and fasteners for attachment to adjoining sheets or panels shall be as approved, and in accordance with the manufacturer's recommendation. Unless specified otherwise herein, the fasteners shall be either self-tapping screws, bolts and nuts, self-locking rivets, self-locking bolts, end-welded studs, bolted or riveted studs, or step rivets held by aluminum straps. Other types of fasteners of the building manufacturer's standard type may be used if prior approval is obtained. The fastening system shall be designed to withstand the design loads specified hereinbefore. Fasteners shall be stainless steel, cadmium-plated steel, or aluminum. All fasteners, with the exception of those having integral hex washer heads and those having aluminum drive caps, shall have composite metal and polychloroprene washers. Fasteners having integral hex washer heads and fasteners having aluminum drive caps shall have polychloroprene washers. Side laps of roofing sheets or panels having configurations 3/4-inch deep, or less shall be fastened at a maximum spacing of 12 inches on centers. (Heads of screw or bolts exposed on exterior face of factory finished wall coverings shall be nylon headed to match color of coverings.)

6.9 Zinc Coated Steel Sheet: ASTM A446, Coating Class G-90.

6.10 Aluminum Coated Steel Sheet: Mil. Spec. MIL-S-4174.

6.11 Aluminum Sheet: Alloy 3004 ALCLAD.

6.12 Insulation, Field Installed: Blanket type 0.6 pound fiber glass as standard with the metal building manufacturer with a factory

applied facing on one side with a permeance rating of 0.05 perm or less when tested in accordance with ASTM E96. Facing on insulation shall be vinyl-scrim foil except that behind liner panels it may be 0.002-inch thick aluminum foil. The insulation, including facings, shall have a flame spread rating of 50 or less and a smoke development factor of 100 or less when tested in accordance with ASTM E84. Wall insulation shall have a "R" Factor of 11 or more. Roof insulation shall have a "R" factor of 19 or more.

6.13 Doors: Framing members and flashings shall be provided as necessary for installation of the doors.

6.13.1 Swinging Personnel Doors and Frames: Fed. Spec. RR-D-575, Type II, Style 3 or 4, class as indicated, zinc-coated and shop primed, exterior mounting. Hardware shall conform to ANSI A156.1, ANSI A156.2, and ANSI A156.4. Doors shall be provided with the following hardware:

DOOR NO.

HARDWARE REQUIRED

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-Mortised exit lock 1000, F07, Grade 2  
-Closer-Surface mounted C02062 x PT4B  
-Hinges-4 1/2" x 4 1/2" A2112 x 626  
-Threshold-outswing with bumper type w/stripping. Alum x vinyl  
-Weather stripping for jambs and head surface applied. Alum x vinyl

6.14 Finish:

6.14.1 Shop Painting: All ferrous metal work, except factory finished work, zinc-coated work, aluminum-coated work, and work specified to be painted hereinbefore, shall be (1) cleaned of all dirt, rust, scale, loose particles, grease, oil, and other deleterious substances, (2) given a coat of pretreatment primer conforming to Mil. Spec. DOD-P-15328 applied to a dry film thickness of 0.3 to 0.5 mil or chemically treated with a phosphoric type cleaner, and (3) then be given one coat of an approved rust-inhibiting primer paint of the type standard with the metal building manufacturer.

6.14.2 Factory Finishing: Exterior and interior exposed surfaces of metal roof and wall panels, roof ventilators, louvers, gutters, downspouts and metal accessories shall be provided with a factory applied baked on enamel finish. The finish shall consist of cleaning, pretreatment with a chemical conversion coating and one coat of baked on synthetic enamel applied to a dry film thickness of not less than one mil. Factory finished materials of the same types and finishes as proposed for this project shall have been tested and have passed the following tests:

a. Salt Spray Test: A 12 inch by 12 inch sample with a minimum of two raw cut edges, shall withstand a salt spray test for a minimum of 500 hours in accordance with ASTM B117. Undercutting of the paint film from the score line shall not exceed 1/16 inch.

b. Accelerated Weathering Test: A 12 inch by 12 inch sample with a minimum of two raw cut edges shall withstand a weathering test a minimum of 1,000 hours in accordance with ASTM D822 without checking, cracking, or loss of adhesion.

c. Flexibility: When formed over a conical mandrel, the film shall show no crack beyond a point where the mandrel diameter is equal to five times the metal thickness.

d. Adhesion: There shall be no film removed by pulling off sharply No. 600, 3/4-inch wide scotch cellophane tape applied to 10 parallel cuts spaced 1/16 inch apart plus 10 similar cuts at right angles. Cuts shall be made with a sharp knife.

e. Field Tests: At the discretion of the Contracting Officer, sample sheets for tests may be taken at random from each delivery or from stockpiles on the site at any time during the construction period. Tests may be made to check the conformance of the materials with tests and with other requirements specified herein. Failure of the sample sheets to pass all of the required tests shall be cause for rejection of all sheets represented by the samples.

7. ERECTION: In accordance with the manufacturer's approved erection instructions and diagrams, except as specified otherwise. Defects or errors in the fabrication of building components shall be corrected in an approved manner. Defects or errors in fabrication of components, which can not be corrected in an approved manner, shall be replaced by nondefective members. Columns and rigid frames shall be plumbed in both directions, guyed and stayed, and all framing elements shall be accurately spaced to assure the proper fitting of prefabricated wall and roof panels.

7.1 Dissimilar Materials: Where aluminum surfaces come in contact with ferrous metal or other incompatible metals, the aluminum surfaces shall be kept from direct contact by one of the following methods:

Method (a). Painting the incompatible metal with a coating of heavy-bodied bituminous paint conforming to Fed. Spec. TT-C-520.

Method (b). Painting the incompatible metal with a prime coat of zinc-chromate primer conforming to Fed. Spec. TT-P-645, followed by one or two coats of aluminum metal-and-masonry paint, or other suitable protective coating, excluding those containing lead pigmentation.

Method (c). An approved nonabsorptive gasket.

Method (d). An approved calking placed between the aluminum and the incompatible metal.

If drainage from incompatible metal passes over aluminum, the incompatible metal shall be painted by method (a) or method (b). Aluminum surfaces in contact with concrete or masonry materials shall be painted by method (a). Green or wet wood, or wood treated with incompatible wood preservatives, shall be painted by method (a) or shall be given two coats of aluminum paint.

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7.2 Sill Members: Set accurately, using a non-shrinking grouting mortar if needed to obtain uniform bearing on the concrete and to maintain a level base line elevation. Anchors and anchor bolts for securing sill members to foundations shall be steel, unpainted, set accurately to templates, and of proper size to adequately resist all applicable design loads at the base. Grouting mortar shall be a mixture of one part of blended portland cement, to two parts of well-graded fine aggregate, and enough water to provide a maximum water cement ratio of 0.50. The blended portland cement shall be a mixture of cement with 1/4 ounce of aluminum powder to each sack of cement. Surfaces to receive the mortar shall be cleaned and moistened thoroughly immediately before placement of mortar. Exposed surfaces of mortar shall be water cured with wet burlap for 7 days.

7.3 Wall Construction: All panels shall be applied with the configurations in a vertical position. Panels shall be supplied in full wall heights from base to eave with no horizontal joints except at the junctions of door frames, window frames, louver panels, and similar locations. All side and end laps shall be sealed with the joint sealing material specified hereinbefore. All walls shall be flashed and/or sealed at the base, at the top, around windows, door frames, framed louvers, and all other similar openings. The placement of closure strips, flashing and sealing material shall be accomplished in an approved manner that will assure complete weathertightness. Flashing will not be required where approved "self-flashing" sheets or panels are used. Minimum end laps for all types of panels shall be 2-1/2 inches. Minimum side laps for all types of panels shall be one corrugation or one configuration. Liner panels shall be provided to ceiling line.

7.4 Roof Construction: All roofing panels shall be applied with the configurations parallel to the slope of the roof. The roofing panels shall be supplied in the longest lengths obtainable with end laps occurring only at structural members with no transverse joints except at the junction of curbs, and similar openings. All side laps shall be laid away from the prevailing wind, and all side and end laps shall be sealed with the joint sealing material specified hereinbefore. The roof shall be flashed and sealed at the ridge, at eaves and rakes, at projections through the roof, and elsewhere as necessary. The placement of closure strips, flashing, and sealing material shall be accomplished in an approved manner that will assure complete weathertightness. Minimum side lap shall be one corrugation, configuration or interlocking rib except 1-1/2 corrugations for standard corrugated sheets. End laps shall be not less than 8 inches and shall occur only over purlins.

#### 7.5 Installation of Insulation:

7.5.1 Roof Insulation: Install over purlins before roof coverings are applied. Insulation shall be held rigid until secured in place. Facing shall be exposed on the interior side of the building. Facing tabs of insulation shall be folded and stapled on 6-inch centers to completely seal joints. If folding and stapling is accomplished from the inside, the tabs shall be pushed neatly up between the edges of adjoining blankets. Side laps of insulation shall be covered with metal strips formed for this purpose and painted to match the facing material. The strips shall span

from purlin to purlin and shall be installed in accordance with the metal building manufacturer's recommendations.

7.5.2 Wall Insulation: Install over girts before roof coverings are applied. Insulation shall be held rigid until secured in place. Facing shall be exposed on the interior side of the building. Facing tabs of insulation shall be folded and stapled on 6-inch centers to completely seal joints. If folding and stapling is accomplished from the inside, the tabs shall be pushed neatly up between the edges of adjoining blankets. Side laps of insulation shall be covered with metal strips formed for this purpose and painted to match the facing material. The strips shall span from girt to girt and shall be installed in accordance with the metal building manufacturer's recommendations.

END OF SECTION

## SECTION 15011

### MECHANICAL GENERAL REQUIREMENTS

#### 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 the basic designation only.

##### 1.1.1 Federal Specifications (Fed. Spec.):

TT-E-489F & Am 1	Enamel, Alkyd, Gloss (for Exterior and Interior Surfaces)
TT-E-496B & Am 2	Enamel, Heat-Resisting (400 Degrees Fahrenheit), Black
TT-P-28F	Paint, Aluminum, Heat Resisting (1200 Degrees Fahrenheit)
TT-P-645A	Primer, Paint, Zinc-Chromate, Alkyd Type

##### 1.1.2 Military Specifications (Mil. Spec.):

DOD-P-15328D	Primer (Wash), Pretreatment (Formula No. 117 for Metals) (Metric)
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##### 1.1.3 American Society for Testing and Materials (ASTM) Publication:

B117-73 (R79)	Salt Spray (Fog) Testing, Method of
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1.2 APPLICATION: This section applies to the piping well sections of Division 2, "Site Work" and all sections of Division 15, "Mechanical" of this project except as specified otherwise in each individual section.

1.3 SUBMITTALS: Submit shop drawings, manufacturers data and certificates for equipment, materials and finish, and pertinent details for each system where specified in each individual section, and have them approved before procurement, fabrication or delivery of the items to the job site. Partial submittals will not be acceptable and will be returned without review. Submittals shall include the manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity project specification and paragraph reference, applicable Federal, Military, industry and technical society publication references, and other information necessary to establish contract compliance of each item the Contractor proposes to furnish.

1.3.1 Shop Drawings: Drawings shall be a minimum of 8.5-inches by 11-inches in size, except as specified otherwise. Drawings shall include floor plans, sectional views, wiring diagrams, and installation

details of equipment; and equipment spaces identifying and indicating proposed location, layout and arrangement of items of equipment, control panels, accessories, piping, ductwork, and other items that must be shown to assure a coordinated installation. Wiring diagrams shall identify circuit terminals, and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance and replacement of operating equipment devices. If equipment is disapproved, drawings shall be revised to show acceptable equipment and be resubmitted.

1.3.2 Manufacturer's Data: Submittals for each manufactured item shall be manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts.

1.3.3 Publication Compliance: Where equipment or materials are specified to conform to industry and technical society publications of organizations such as American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), and Underwriters Laboratories, Inc. (UL), proof of such compliance shall be submitted. The label or listing by the specified organization will be acceptable evidence of compliance. Submit a certificate from an independent testing organization adequately equipped and competent to perform such services, and approved by the Contracting Officer, stating that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's publication.

1.3.4 Certified Test Reports: The testing requirements in referenced publications for materials will be waived provided the manufacturer's original certificates are submitted stating that previously manufactured materials have been tested by approved laboratories, that such materials meet testing requirements specified, and that the materials furnished for this project are of the same type, quality, manufacture, and make as that tested; copies of the test reports need not be submitted except as specifically requested by the Contracting Officer.

1.3.5 Certificates of Compliance: Submit certification attesting that materials and equipment to be furnished for this project comply with the requirements of this specification and of the reference publications. Pre-printed certifications will not be acceptable; certifications shall be the manufacturer's original. The certification shall not contain statements that could be interpreted to imply that the product does not meet all requirements specified, such as "as good as", "achieve the same end use and results as materials formulated in accordance with the referenced publications"; "equal or exceed the service and performance of the specified material". The certification shall simply state that the product conforms to the requirements specified.

1.4 OPERATION AND MAINTENANCE MANUAL: Furnish an operation and maintenance manual for each item of equipment. Furnish three copies of the manual bound in hardback binders or an approved equivalent. Furnish one complete manual prior to the time that equipment tests are performed, and furnish the remaining manuals before the

contract is completed. Inscribe the following identification on the cover: the words OPERATION AND MAINTENANCE MANUAL, the name and location of the equipment or the building, the name of the Contractor, and the contract number. The manual shall include the names, addresses, and telephone numbers of each subcontractor installing equipment, and of the local representatives for each item of equipment. The manual shall have a table of contents and be assembled to conform to the table of contents with the tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in. The manual shall include: wiring and control diagrams with data to explain detailed operation and control of each item of equipment; a control sequence describing start-up, operation and shut-down; description of the function of each principal item of equipment; the procedure for starting; the procedure for operating; shut-down instructions; installation instructions; maintenance instructions; lubrication schedule including type, grade, temperature range, and frequency; safety precautions, diagrams, and illustrations; test procedures; performance data; and parts list. The parts lists for equipment shall indicate the sources of supply, recommended spare parts, and the service organization which is reasonably convenient to the project site. The manual shall be complete in all respects for equipment, controls, accessories, and associated appurtenances provided.

1.5 POSTED OPERATING INSTRUCTIONS: Furnish approved operating instructions for each principal item of equipment for the use of the operation and maintenance personnel. The operating instructions shall include wiring diagrams, control diagrams, and control sequence for each principal item of equipment. Operating instructions shall be printed or engraved, and shall be framed under glass or in approved laminated plastic and posted where directed by the Contracting Officer. Operating instructions shall be attached to or posted adjacent to each principal item of equipment including start up, proper adjustment, operating, lubrication, shut-down, safety-precautions, procedure in the event of equipment failure, and other items of instruction as recommended by the manufacturer of each item of equipment. Operating instructions exposed to the weather shall be made of weather-resisting materials or shall be suitably enclosed to be weather protected. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

1.6 INSTRUCTION TO GOVERNMENT PERSONNEL: Furnish the services of competent instructors to give full instruction to the Government personnel in the adjustment, operation and maintenance, including pertinent safety requirements of each item of equipment and each system. Each instructor shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instructions shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Government for regular operation. The number of mandays (8-hours) of instruction furnished shall be as specified in each individual section.

1.7 DELIVERY AND STORAGE: Properly store, adequately protect and carefully handle equipment and materials to prevent damage before

and during installation. Handle, store, and protect equipment and materials in accordance with the manufacturer's recommendations. Replace damaged or defective items.

1.8 CATALOGED PRODUCTS: Materials and equipment shall be cataloged products of manufacturers regularly engaged in production of such materials or equipment and shall be manufacturer's latest design that complies with the specification requirements. Materials and equipment shall duplicate items that have been in satisfactory commercial or industrial use. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the items need not be the products of the same manufacturer. Each item of equipment shall have the manufacturer's name, address, model number and serial number on the nameplate of the distributing agent will not be acceptable.

1.9 VERIFICATION OF DIMENSIONS: Coordinate the proper relation of the work to the building structure and to the work of all trades. Visit the premises and become familiar with the dimensions in the field, and advise the Contracting Officer of the discrepancy before performing any work.

1.10 MANUFACTURER'S RECOMMENDATIONS: Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Contracting Officer prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

1.11 ELECTRICAL REQUIREMENTS: Furnish motors, controllers, contactors, and disconnects with their respective pieces of equipment except controllers indicated as part of the motor control centers shall be provided under Section 16402, "Interior Wiring Systems". Motors, controllers, contactors, and disconnects shall conform to and shall have electrical connections provided under Section 16402, "Interior Wiring Systems". Furnish internal wiring for components of packaged equipment as an integral part of the equipment. Extended voltage range motors will not be permitted. Controllers and contactors shall have a maximum of 120 volt control circuits. When motors and equipment furnished are larger than sizes indicated, the cost of additional electrical service and related work shall be included under the section that specified that motor or equipment. Power wiring and conduit for field installed equipment, and motor control equipment forming part of motor control centers or switchgear assemblies, and conduit and wiring connecting such centers, assemblies or other power sources to equipment shall be provided under and conform to the requirements of Section 16402, "Interior Wiring Systems".

## PART 2 - EXECUTION

2.1 PAINTING OF EQUIPMENT: Equipment painting, factory applied or shop applied, shall be as specified herein, and provided under each individual section of this specification.

2.1.1 Factory Painting Systems: Manufacturer's standard factory painting systems may be provided subject to certification that the factory painting system applied will withstand 125 hours in a salt-spray fog test, except that equipment located outdoors shall withstand 500 hours in a salt spray fog test. Salt spray fog test shall be in accordance with ASTM B117. Immediately after completion of the test, the paint shall show no signs of blistering, wrinkling or cracking; and no loss of adhesion; and the specimen shall show no signs of rust creepage beyond 0.125 inch on either side of the scratch mark. The film thickness of the factory painting system applied on the equipment shall not be less than the film thickness used on the test specimen. If manufacturer's standard factory painting system is being proposed for use in lieu of the shop painting systems using Fed. Spec. TT-E-496 certifications that the manufacturer's standard factory painting system will conform to the heat resistance requirement of Fed. Spec. TT-E-496 shall be submitted in addition to other certifications.

2.1.2 Shop Painting Systems: Clean, pretreat, prime and paint metal surfaces; except aluminum surfaces shall not be painted. Apply coatings to clean dry surfaces. Clean the surfaces to remove dust, dirt, rust, oil and grease by wire brushing and solvent degreasing prior to application of paint, except metal surfaces subject to temperatures in excess of 120 degrees Fahrenheit (F) shall be cleaned to bare metal. Where more than one coat of paint is specified, apply the second coat after the preceding coat is thoroughly dry. Lightly sand damaged painting and retouch before applying the succeeding coat.

2.1.2.1 Metal Surfaces Subject To Temperatures Less Than 120 Degrees F.: Immediately after cleaning, the metal surfaces shall receive one coat of Mil. Spec. DOD-P-15328 pretreatment primer applied to a minimum dry film thickness of 0.3 mil, one coat of Fed. Spec. TT-P-645 primer applied to a minimum dry film thickness of one mil; and two coats of Fed. Spec. TT-E-489 enamel applied to a minimum dry film thickness of one mil per coat.

2.1.2.2 Metal Surfaces Subject To Temperatures Between 120 and 400 Degrees F.: Surfaces shall receive two coats of Fed. Spec. TT-E-496, Type II, heat-resisting enamel applied to a total minimum thickness of 2 mils.

END OF SECTION

## SECTION 15221

### WATER WELL MECHANICAL WORK

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 the basic designation only.

#### 1.1 Federal Specifications (Fed. Spec.):

GG-G-76D	Gages, Pressure and Vacuum, Dial Indicating
WW-P-421D	Pipe, cast gray and ductile iron, pressure (for water and other liquids)
WW-U-531E	Unions, Pipe; Steel or Malleable Iron, Threaded Connections
WW-V-51F	Valves, Bronze; Angle, Check and Globe (125, 150 and 200 Pound; Threaded, Flanged and Solder)
WW-V-54D & Am 3	Valves, Gate, Bronze (125, 150 and 200 Pound; Threaded, Flanged and Solder)
WW-V-58B	Valves, Gate, Cast Iron (Threaded and Flanged)

#### 1.2 Military Specification (Mil. Spec.):

MIL-P-16077A	Pumps, Centrifugal, Water-Circulating, Electric-Motor-Driven
MIL-S-16293F	Strainers, Sediment, Pipeline
MIL-V-18436C & Am 2	Valves, Check; Bronze, Cast-Iron and Steel Body

#### 1.4 American National Standards Institute (ANSI) Publications:

A21.10-77	Gray-iron and ductile-iron fittings, 3 in. through 48 in., for water and other liquids.
A21.11-72	Rubber gasket joints for cast-iron and ductile-iron pressure pipe and fittings.
B16.1-75	Cast-Iron Pipe Flanges and Flanged Fittings.
B16.3-77	Malleable-Iron Threaded Fittings, 150 and 300 Pounds or sand-lined molds, for water or other liquids.
B16.18-78	Cast bronze solder-joint pressure fittings.
B16.22-73	wrought copper and bronze solder-joint pressure fittings.

#### 1.5 American National Standards Institute/American Water Works Association (ANSI/AWWA) Publications:

E101-77	Vertical Turbine Pumps; Line Shaft and Submersible Types.
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1.6 American Society for Testing and Materials (ASTM)  
Publications:

A53-77	Welded and Seamless Steel Pipe
A120-77	Black and Hot Dipped Zinc Coated (Galvanized) Welded and Seamless Steel Pipe
A525-76	Steel, Sheet, Zinc Coated
B88-76	Seamless Copper Water Tube.

1.7 American Water Works Association (AWWA) Publications:

C 500-71	Gate valves - 3 in. through 48 in. - for water and other liquids
C 601-68	Disinfecting water mains.
C 701-70	Cold water motors - turbine type for customer service.

1.8 National Fire Protection Association (NFPA) Publications:

24-77	Outside Protection.
70-81	National Electrical Code

2. GENERAL REQUIREMENTS: Section 15011, "General Requirements, Mechanical", applies to this section, with the additions and modifications specified herein.

2.1 Description of Work: The work includes providing new water well pump, piping systems, and related work. Each pump assembly shall be complete and ready for operation. Capacity and efficiency of each pump assembly shall be not less than that indicated. Equipment, materials, installation and workmanship shall be in accordance with ANSI/AWWA E101, except as specified or indicated otherwise. In the publications referred to herein, the advisory provisions shall be considered to be mandatory, as though the word "shall" had been substituted for "should" wherever it appears; reference to the "authority having jurisdiction" shall be interpreted to mean the Contracting Officer.

2.2 Submittals Required: The submittal requirements of Section 15011, "General Requirements, Mechanical", applies to the following lists.

2.2.1 Manufacturer's Data:

- a. Water Pumps
- b. Manufacturer's Certified Pump Discharge Curves
- c. Pipe and Fittings

2.2.2 Shop Drawings:

- a. Water Pumps

2.2.3 Certificates of Compliance:

- a. Pipe and Fittings

2.2.4 Certified Data:

- a. Water Pump Discharge Curves

2.2.5 Operation and Maintenance Manuals:

- a. Water Well Pump

2.2.6 Posted Operating Instructions:

- a. Water Well Pump

3. EQUIPMENT:

3.1 Water Well Pumps: ANSI/AWWA E101, manual starting, electric motor driven, multi-stage centrifugal, oil lubricated, vertical shaft turbine type water pumps, combination right angle drive, except as specified or indicated otherwise. Pumps shall have nonreverse ratchet, cast iron discharge head with ANSI B16.1 Class 125 discharge flange, zinc-coated steel pipe discharge column, stainless steel shaft, bronze impeller, cast iron bowl assemblies, and bronze basket strainers. Electric motor driver and controller shall be furnished with each pump; and shall conform to and shall have all electric connections provided under Section 16402, "Electrical Work".

3.2 Combination Right Angle Drive: The combination right angle drive shall be of the spiral bevel gear type with a ratio of 1:1. The AGMA service factor rating for the bevel gears shall be 1.5 or greater. Thrust bearings shall be installed of the capacity for supporting the pump when the electric motor is removed. The bearings shall be of the anti-friction type. The drive shall be oil lubricated with a positive type oil pump for pressure lubrication of the bearings. The shaft shall be provided with a non-reversing ratchet. The drive shall be provided with a cast iron housing. Operation of the drive shall be so that the upper half of the gear drive coupling is free to rotate with the pump headshaft and the gears do not revolve when the electric motor is operating. The pump can be driven by the diesel engine by lowering an integral sliding clutch into drive position or by installing stainless steel bolts.

4. WATER PIPING SYSTEMS: Sizes 3 inches and larger shall be cast iron pipe. Sizes less than 3 inches shall be steel pipe or copper tubing. Provide red rubber gaskets for flanges.

4.1 Cast Iron Pipe: Fed. Spec. WW-P-421, Grade B, Thickness Class 23 for gray cast iron, Grade C, Thickness Class 52 for cast ductile iron, with flanged joint fittings (ANSI A21.10 and A21.11), cement mortar lined pipe and fittings, except underground piping not under the building and more than 5 feet outside of the building walls may be mechanical joint pipe and fittings. Anchor mechanical joints in accordance with NFPA 24, using pipe clamps and rods.

4.2 Steel Pipe: ASTM A53 or A120, Schedule 40, zinc coated, threaded pipe; with ANSI B16.3, zinc coated threaded fittings. Jointing compound for pipe threads shall be pipe cement and oil, or graphite and oil. Short pipe nipples shall be extra strong.

4.3 Copper Tubing: ASTM B88 hard drawn, Type K or L; with ANSI B 16.18 or B16.22, solder joint fittings using 50-50 lead-tin solder.

4.4 Valves Above Ground:

4.4.1 Gate Valves: Fed. Spec. WW-V-54, Class 125, except valves 2.5 inches and larger shall conform to Fed. Spec. WW-V-58, Class 125.

4.4.2 Check Valves: Fed. Spec. WW-V-51, Class 125, swing check; except valves 2.5 inches and larger shall conform to Mil. Spec. MIL-V-18436. Class 125, with clear opening swing check type, flanged inspection and access cover.

4.4.3 Hose Bibbs: Bronze body with hand wheel. Inlet shall have internal threads. Outlet shall have hose bibb vacuum breaker with 0.75 inch external hose threads.

4.5 Gate Valves on Buried Piping: AWWA C500, nonrising stems and shall be double-disc parallel seat type. Valves shall open by counterclockwise rotation of the valve stem. Valves shall have O-ring stem seals, except when gearing is provided, in which case conventional packing shall be used in lieu of O-ring seal. Stuffing boxes shall be bolted and constructed so as to permit the easy removal of parts for repairs.

4.6 Water meters: water meters shall conform to AWWA C701 turbine type for customer service and register shall indicate U.S. Gallons. Certificate of testing water meters for conformance to accuracy and capacity requirements in accordance with the applicable AWWA Standard shall be furnished.

4.7 Strainers: Mil. Spec. MIL-S-16293, Class 125, Style Y, and shall have blow off outlet with pipe nipple and gate valve.

4.8 Gages: Fed. Spec. GG-G-76, single style pressure gage for water, with 4.5 inch dial brass or aluminum case, bronze tube, gage cock, pressure snubber, and syphon. Scale range and unit shall be as indicated on drawings.

4.9 Disinfection: New water piping and existing water piping affected by the Contractors operations, shall be disinfected in accordance with AWWA C601. Piping system shall be filled with solution containing minimum of 50 parts per million of available chlorine and allowed to stand for minimum period of 24 hours. Solution shall be flushed from system with cleanwater until maximum residual content is not greater than 0.2 parts per million.

4.10 Connections to Existing Water Supply Main: Drilling machine valve and sleeves shall be used for connections to be made under

pressure. The sleeves shall be bolted around the mains and caulked: the valve bolted to the branch. The valve shall conform to the latest specification for valves of the American Water Works Association. The valves shall be opened, the drilling machine attached; the tap made, the valve closed and the drilling machine removed all without interruption of service. The Contractor shall furnish all material required to make connections into the existing water supply systems; and shall perform all necessary excavating, backfilling and other incidental labor as required. The Contractor shall furnish the labor and the tapping or drilling machine for making the actual connections to the existing systems. The Contracting Officer shall be notified in writing at least ten days prior to the date the connections are required. Approval by the Contracting Officer shall be received before any service is interrupted.

4.11 Pipe Anchorage: Anchorage of buried pipe lines shall be by means of concrete thrust blocks (reaction backing), using concrete with a minimum compressive strength of 2000 psi. All 1/16 and sharper bends, tees, and dead ends of pipe shall be securely blocked in the direction of flow with poured-in-place concrete bearing solidly against the pipe and affording a minimum of 3 square feet of bearing area against a vertical trench face for 3- and 4-inch pipe, and in accordance with LANTDIV Plate WD-1 for piping 6-inch diameter and larger. Plate WD-1 appears at the end of Section 15272, Water Distribution.

4.12 Valve Boxes: Each gate valve on buried piping shall be provided with an adjustable cast-iron valve box of a size suitable for the valve on which it is to be used. Outside of paved areas boxes may be of plastic; such plastic valve boxes shall be constructed of ABS (Acrylonitrile-Butadiene-Styrene) plastic or of inorganic fiber reinforced black polyolefin plastic. The head shall be round and the lid shall have the word "WATER" cast on it. The least diameter of the shaft of the box shall be 5.25 inches. Each cast-iron box shall be given a heavy coat of bituminous paint.

4.13 Setting Valves and Valve Boxes: Valves and valve boxes shall be set plumb, and centered, with valves boxes placed directly over the valves. Valve boxes shall, if possible, be located outside the area of the roads and streets. Earth fill shall be carefully tamped around the valve box to a distance of 4 feet on all sides of the box, or to the undisturbed trench face if less than 4 feet. Valves shall have the interiors cleaned of all foreign matter before installation. Stuffing boxes shall be tightened and the valve shall be inspected in opened and closed positions to see that all parts are in working condition.

4.14 Air Release Valve: Each air release valve shall automatically function to release to atmosphere entrained air. Once the accumulated air is exhausted, the valve shall seat tightly to prevent water leakage. The valve body and cover shall be of semisteel; float of stainless steel; levers of bronze, with resilient seat and designed for operating pressure to 150 psi.

4.15 Pipe Supports: Each pipe support shall consist of cast iron saddle, locknut nipple and cast iron reducer. Pipe support shall comply with Federal Specification WW-H-171D (Type 39).

5. HAND AIR PUMP: Pump shall have 18 by 1.75 inch barrel, minimum 18 inch long flexible rubber hose; check valve, screw on connector, solid base and handle.

6. PIPE SLEEVES: Provide where piping passes through masonry or concrete walls, floors, roofs, and partitions. Sleeves in outside walls shall be zinc coated steel pipe. Sleeves in partitions shall be zinc coated sheet steel having a nominal weight of not less than 0.90 pound per square. Space between piping or insulation, and the sleeve shall be not less than 0.25 inch. Sleeves shall be held securely in proper position and location during construction. Sleeves shall be of sufficient length to pass through entire thickness of walls, partitions or slabs. Sleeves in floor slabs shall extend 2 inches above the finished floor. Space between the pipe and the sleeve shall be firmly packed with insulation and calked at both ends of the sleeve with plastic waterproof cement.

7. ELECTRICAL:

Electrical Motors, Controllers, Contactors, and Disconnects: Furnish motors, controllers, contactors, and disconnects with their respective pieces of equipment. Motors, controllers, contactors, and disconnects shall conform to and shall have electrical connections provided under Section 16402, "Interior Wiring Systems". Controllers and contactors shall have a maximum of 120 volt control circuits, and auxiliary contacts for use with the controls furnished. When motors and equipment furnished are larger than sizes indicated, the cost of providing additional electrical service and related work shall be included under this section.

Electrical Work: Is specified in the Section 16402, Interior Wiring Systems, except for control wiring. Control wiring shall be provided under this section and shall conform to NFPA 70; use rigid metal conduit.

8. FIELD TESTING: Tests to determine conformance with the specified requirements shall be performed in the presence of the Contracting Officer. Upon completion and before final acceptance of the work, each system shall be tested to demonstrate conformance with the contract requirements. Pumps, drives, controllers and associated equipment shall be tested in accordance with ANSI/AWWA E101. All defects shall be corrected by the Contractor at his own expense and additional tests made until it has been demonstrated that the systems comply with all contract requirements. All appliances and equipment for testing shall be furnished by the Contractor and all expenses in connection with tests, shall be defrayed by him. Each pump shall be tested to demonstrate conformance with the contract requirements by pumping water at not less than the indicated flow and head for two hours.

END OF SECTION

## SECTION 15272

### WATER DISTRIBUTION

1. APPLICABLE PUBLICATIONS: The following publications of the issues listed below, but referred to elsewhere by basic designation only, form a part of this specification to the extent indicated by references thereto (where a number is suffixed to the specification number, it denotes the effective amendment to the specification):

#### 1.1 Federal Specifications:

WW-P-421D	Pipe, cast gray and ductile iron, pressure (for water and other liquids)
WW-V-51E(2)	Valve, angle, check, and globe, bronze (125, 150 and 200 pound, threaded ends, flange ends, solder ends, and brazed ends, for land use).
WW-V-54D(3)	Valve, gate, bronze (125, 150, and 200-pound); threaded ends, flange ends, solder end, and brazed ends, for land use).
WW-V-58B	Valves, gate, cast-iron; threaded and flanged (for land use).

#### 1.2 Military Specifications:

MIL-V-18436c(2)	Valves, check: bronze, cast-iron, and steel body.
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#### 1.3 American Society for Testing and Materials (ASTM):

B 61-74	Steam or valve bronze castings.
B 62-74	Composition bronze or ounce metal castings.
B 88-76	Seamless copper water tube.
D 1869-66 (1972)	Rubber rings for asbestos-cement pipe.
D 2321-74	Underground Installation of Flexible Thermoplastic Sewer Pipe.

#### 1.4 American Water Works Association (AWWA):

C 106-75	Cast-iron pipe centrifugally cast in metal molds, for water or other liquids.
C 110-71	Gray-iron and ductile-iron fittings, 2 in. through 48 in., for water and other liquids.
C 111-72	Rubber gasket joints for cast-iron and ductile-iron pressure pipe and fittings.
C 115-75	Flanged cast-iron and ductile-iron pipe with threaded flanges.

- C 151-76 Ductile-iron pipe, centrifugally cast in metal molds or sand-lined molds, for water or other liquids.
- C 400-75 Asbestos cement pressure pipe for water and other liquids.
- C 500-71 Gate valves - 3 in. through 48 in. - for water and other liquids.
- C 600-64 Installation of cast-iron water mains.
- C 601-68 Disinfecting water mains.
- C 603-65 Installation of asbestos-cement water pipe.
- C 701-70 Cold water meters - turbine type for customer service.
- C 900-75 Polyvinylchloride (PVC) pressure pipe, 4-inch through 12-inch for water.

1.5 Underwriters' Laboratories (UL):

- UL 194 The performance of gasketed joints for cast-iron pressure pipe and fittings, May 1973.

1.6 American National Standards Institute (ANSI):

- A21.1-(1967) Thickness design of cast-iron pipe.  
(R1972)
- A21.6-1975 Cast-iron pipe centrifugally cast in metal molds for water or other liquids.
- A21.10-1971 Gray-iron and ductile-iron fittings, 2 in. through 48 in., for water and other liquids.
- A21.11-1972 Rubber gasket joints for cast-iron and ductile-iron pressure pipe and fittings.
- A21.15-1975 Flanged cast-iron and ductile-iron pipe with threaded flanges.
- A21.51-1976 Ductile-iron pipe, centrifugally cast in metal molds or sand-lined molds, for water or other liquids.
- B16.26-1975 Cast copper alloy fittings for flared copper tubes.

1.7 National Fire Protection Association (NFPA):

- 24-73 Outside Protection.

1.8 LANTDIV Plates:

- WD-1 Standard thrust blocks for water mains.

2. GENERAL REQUIREMENTS: Section 15011, General Requirements, Mechanical, also applies to this section except as specified otherwise. The work includes provision of water piping and appurtenances outside of the limits bounded by the building five-foot line, the five-foot building line being a line drawn five feet outside of the outside face of building walls and parallel thereto.

3. SUBMITTALS REQUIRED: Shop drawings, manufacturer's data and certificates for equipment, materials, finish, and pertinent details for each system shall be submitted and approved before procurement, fabrication or delivery of such items to the job site. Partial submission will not be acceptable. Descriptive data shall be annotated to show the specific model, type and size of each item the Contractor proposes to furnish. The submittal requirements of Section 15011, General Requirements, Mechanical, applies to the following lists. Items in the following lists (which are followed by (CO)) shall be approved by the Contracting Officer.

3.1 Manufacturer's Data:

- a. Valves
- b. Meters

3.2 Certificates: Submit certificates from the manufacturer attesting that each of the following items conform to all requirements of this specification and of reference publications.

- a. Pipe and Fittings, Joints, and Couplings
- b. Valves
- c. Meters

4. MATERIALS:

4.1 Pipe: Water piping 4 inches in diameter and larger shall be either cast-iron, asbestos cement, or P.V.C. Water piping 3 inches in diameter shall be either cast-iron piping or copper tubing. In lieu of 3-inch pipe, fittings, and valves, 4-inch pipe, fittings and valves may be used. Water piping less than 3 inches in diameter shall be copper tubing.

4.1.1 Asbestos cement pipe shall conform to AWWA C 400, Class 150. Asbestos cement pipe shall be provided with tracer wire as specified hereinafter.

4.1.2 PVC plastic pipe shall conform to AWWA C 900, pressure class 150. Pipe shall have cast iron pipe size overall diameter, and with ends suitable for use with the joints specified, as well as with the cast iron fittings specified.

4.1.3 Cast-iron pipe shall conform to the applicable requirements of WW-P-421 for Grade A, as modified herein. Pipe shall be thickness Class 1 for cast gray iron pipe and thickness Class 50 for cast ductile iron pipe, except as otherwise specified for flanged pipe. Pipe shall have cement-mortar lining and shall have ends suitable for joints specified hereinafter.

(a) Gray cast-iron pipe shall conform to the applicable requirements of ANSI A21.6 (AWWA C 106) or ANSI A21.8 (AWWA C108), except as modified by WW-P-421, and except that flanged pipe shall conform to ANSI A21.15 (AWWA C115) minimum 150 PSI working pressure, outside coated, cement-mortar lined.

(b) Ductile-iron pipe shall conform to the applicable requirements of ANSI A21.51 (AWWA C151), except as modified by WW-P-421, and except that flanged pipe shall conform to ANSI A21.15, minimum 150 PSI working pressure, outside coated, cement-mortar lined.

4.1.4 Copper tubing shall be hard copper tubing conforming to ASTM B88, Type K.

#### 4.2 Fittings:

4.2.1 Asbestos cement pipe fittings shall be cast-iron conforming to the applicable requirements of ANSI A21.10 (AWWA C110), and may be either mechanical joint or push-on joint type. Push-on joint fittings shall have bell design to fit the particular make of pipe and sealing ring on which the fittings are to be used. Fittings shall have cement-mortar lining equivalent to that specified for cast-iron pipe.

(a) Fittings for asbestos-cement pipe may, at the option of the Contractor, be solid copper with rubber ring gaskets of a type approved by the manufacturer of the pipe. Fittings shall be designed for pressure and water hammer in accordance with the applicable requirements less than 500 pounds per square inch hydraulic pressure. Rubber gaskets shall be suited to assembly by the same method used for assembling pipe and couplings. Installation shall be in accordance with the printed directions of the manufacturer of the fittings. Only one type of fitting (copper or cast iron) shall be used for the work.

4.2.2 Fittings PVC plastic pipe shall be either cast gray or ductile iron fittings conforming to ANSI A21.11 (AWWA C110). Ends of fittings shall be suitable for use with the elastomeric-gasket bell-ends of PVC plastic pipe. Fittings shall have pressure rating at least equivalent to that of the pipe. Fittings shall have cement mortar lining as specified for cast iron pipe.

Joints in PVC plastic pipe shall be made with elastomeric-gasket couplings as specified in AWWA C900. Couplings shall be of the same pressure class as the pipe. Solvent-cement joints are not acceptable.

4.2.3 Fittings for cast gray and ductile iron pipe shall conform to the applicable requirements of ANSI A21.10 (AWWA C110) and may be either cast gray or ductile iron; fittings with push-on joint ends shall be as specified for bell-and-spigot joint ends except that bell design shall be modified, as approved, for push-on joints. Fittings shall have pressure rating at least equivalent to that of the pipe. Fittings shall have cement mortar lining equivalent to that of the pipe lining.

4.2.4 Fittings for copper tubing shall conform to the applicable requirements of ANSI B16.18 or B16.22 for solder-joint fittings.

#### 4.3 Joints and Jointing Materials:

4.3.1 Asbestos-Cement Piping: Jointing materials for pipe and fittings shall conform to the applicable requirements of ASTM D1869 and shall be non-oil-resistant type.

#### 4.3.2 Cast Gray and Ductile Iron Pipe:

(a) Push-on Joints: Shape of pipe ends shall conform to the applicable requirements of WW-P-421 for Type II pipe. Conformation of ends for fittings shall conform to the applicable requirements of ANSI A21.11 (AWWA C111). Gaskets and lubricants for pipe and fittings shall conform to the applicable requirements of ANSI A21.11 (AWWA C111). Drawings of the joint and gasket shall be furnished. Push-on joints shall also meet the applicable requirements of UL 194.

(b) Mechanical Joints: Dimensional and material requirements for pipe ends, glands, bolts and nuts, and gaskets shall conform to the applicable requirements of ANSI A21.11 (AWWA C111) or to the applicable requirements specified for Type III pipe in WW-P-421. Mechanical joints shall also meet the applicable requirements of UL 194.

(c) Flanged Joints: Ends of pipe and fittings shall be provided with cast-iron flanges conforming to the applicable requirements of ANSI A21.15. Bolts, nuts, and gaskets for flanged connections shall conform to the recommendations in the Appendix to ANSI A21.15. Gaskets shall be plain rubber, 1/8-inch thick.

(d) Adapters: Adapters shall be provided for connections of cast-iron pipe or asbestos-cement pipe to flanged accessories.

4.3.3 Insulating Joints: Joints between pipe of dissimilar metals shall be made up with a rubber-gasketed or other suitable approved type of insulating joint or dielectric coupling which will effectively prevent metal-to-metal contact between adjacent sections of piping.

4.4 Valves: Valves conforming to the same specification shall be of one make throughout the project.

##### 4.4.1 Gate Valves:

(a) Gate Valves on Buried Piping: Valves shall have non-rising stems and shall be double-disc parallel seat type. Valves shall open by counterclockwise rotation of the valve stem. Valves shall have O-ring stem seals, except when gearing is specified, in which case conventional packing shall be used in lieu of O-ring seal. Stuffing boxes shall be bolted and constructed so as to permit the easy removal of parts for repair.

(1) Valves 3-inch Size and Larger: Except as otherwise specified hereinafter, valves shall conform to AWWA C500 or to UL 262. Valves shall have mechanical-joint or push-on joint ends and gaskets conforming to ANSI A21.11 (AWWA C111), except as follows: Valves may have special ends, as approved, for connection to asbestos-cement piping. Valves conforming to UL 262 shall be designed for a hydraulic working pressure of 175 psi for valve sizes 12-inch and smaller and 150 psi for sizes larger than 12-inch. For the following conditions, valves shall conform to Standard UL 262 only: (a) for use at working pressures exceeding 175 psi for valve sizes 12-inch and smaller and 150 psi for 14-inch valve size; (b) for use with indicator posts. AWWA gate valves 16-

inch size and larger shall be provided with gearing and bypasses, and with indicators.

(2) Valves Smaller than 3-inch Size: Valves shall conform to the requirements of AWWA C500, except for size, or to UL 262. Valves shall be designed for a working pressure of 175 psi.

(b) Gate Valves in Valve Chambers, Valve Pits and in Above Ground Locations:

(1) Valves 3-inch Size and Larger: Valves shall conform to WW-V-58 or UL 262. Valves shall be of the outside-screw-and-yoke configuration. Valves shall have flanged ends unless otherwise indicated or otherwise specified hereinafter. Valves conforming to WW-V-58 shall be Type II, Class 1. Valves conforming to UL 262 shall be designed for a hydraulic working pressure of 175 psi for valve sizes 12-inch and smaller and 150 psi for valve sizes larger than 12-inch.

(2) Valves Smaller than 3-inch Size: Valves shall conform to either WW-V-54, WW-V-58, or to UL 262. Valves conforming to WW-V-54 shall be Type III, Class A. Valves conforming to WW-V-58 shall be Type II, Class 1. Valves conforming to UL 262 shall be of outside-screw-and-yoke configuration and shall be designed for a hydraulic working pressure of 175 psi. Valves shall have threaded ends.

#### 4.4.2 Check Valves:

(a) Check Valves 3-inch Size and Larger: Valves shall conform to MIL-V-18436 or to UL 312. Valves shall have hub ends suitable for mechanical joint on buried lines; and shall have flanged ends in valve chambers, valve pits, or in above ground locations. Swing-check valves shall have clear-port opening. Valves conforming to MIL-V-18436 shall be Type III, shall have a cast-iron or steel bodies with bronze trim, and shall be designed for a hydraulic working pressure of 175 psi for valve sizes 12-inch and smaller and 150 psi for valve sizes larger than 12-inch.

(b) Check Valves Smaller Than 3-inch Size: Valves shall conform to either WW-V-51, MIL-V-18436, or UL 312. Valves shall have threaded ends. Valves conforming to WW-V-51 shall be Type IV, Class A. Valves conforming to MIL-V 18436 shall be Type III, shall have cast-iron or steel bodies with bronze trim, and shall be designed for a hydraulic working pressure of 175 psi.

4.5 Valves Boxes: Except where indicator posts are provided, each gate valve on buried piping shall be provided with an adjustable cast-iron valve box of a size suitable for the valve on which it is to be used. Outside of paved areas boxes may be of plastic; such plastic valve boxes shall be constructed of ABS (Acrylonitrile-Butadiene-Styrene) plastic or of inorganic fiber reinforced black polyolefin plastic. The head shall be round and the lid shall have the word "WATER" cast on it. The least diameter of the shaft of the box shall be 5-1/4 inches. Each cast-iron box shall be given a heavy coat of bituminous paint.

## 5. INSTALLATION OF PIPELINES:

5.1 Location of Water Lines: Where the location of the water line is not clearly defined by dimensions on the project drawings, the water line shall not be laid closer horizontally than 10-feet from any sewer line. Where water lines cross under gravity sewer lines, the sewer line for a distance of at least 10-feet on each side of the crossing shall be fully encased in concrete, unless sewer line is made of pressure pipe with rubber-gasketed joints and no joint is located within 3-feet horizontally of the crossing. Water lines shall in all cases cross above sewer force mains and inverted siphons and shall be not less than 2-feet above sewer line; joints in sewer line closer horizontally than 3-feet to the crossing shall be encased in concrete. Water lines shall not be laid in the same trench with gas lines, fuel lines, or electric wiring.

5.2 Handling: Pipe, fittings, valves, hydrants, and other accessories shall be handled in such manner as to insure delivery to the trench in sound, undamaged condition. Special care shall be taken not to injure pipe coatings or linings. If coatings or linings of pipe and fittings are damaged, satisfactory repairs shall be made at no extra cost to the Government. Pipe shall be carried to the trench and not dragged. Rubber gaskets that are not to be installed immediately shall not be left in the sunlight, but shall be stored under cover out of direct sunlight.

5.3 Pipe Laying and Jointing: Pipe, fittings, valves and accessories will be carefully inspected before and after installation and those found defective will be rejected. Pipe and fittings shall be free from fins and burrs. Before being placed in position, pipe, fittings, valves, and accessories shall be cleaned, and shall be maintained in a clean condition. Proper facilities shall be provided for lowering sections of pipe into trenches. Under no circumstances shall pipe, fittings, valves, or any other water line material be dropped or dumped into trenches. Pipe shall be cut accurately to measurements established at the site and shall be worked into place without springing or forcing. Piping that does not allow sufficient space for proper installation of jointing material shall be replaced by one of proper dimensions. Blocking or wedging between bells and spigots will not be permitted. Bell-and-spigot pipe shall be laid with the bell end pointing in the direction of laying. The pipe shall be graded in straight lines, taking care to avoid the formation of any dips or low points. Pipe shall be supported at its proper elevation and grade, care being taken to secure firm and uniform support. Wood support blocking will not be permitted. The full length of each section of pipe and fittings shall rest solidly on the pipe bed, with recesses excavated to accommodate bells, joints, and couplings. Anchors and supports shall be provided where necessary and where indicated on the project drawings for fastening work into place. Proper provision shall be made for the expansion and contraction of pipe lines. Trenches shall be kept free of water until joints have been properly made. Open ends of pipe at the end of each day's work shall be closed temporarily with wood blocks or bulkheads. Pipe shall not be laid when the conditions of trench or weather are unsuitable. Depth of bury shall be not less than three feet. Piping shall be inspected, tested, and approved before being completely buried, covered, or concealed. Excavation bedding and backfilling of pipe trenches shall be as specified in the section entitled "Earthwork", as modified herein.

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5.4 Manufacturer's Recommendations: Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Contracting Officer prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

5.5 Special Installation Requirements: Asbestos-cement pipe shall be installed in accordance with AWWA-C-603 except as modified herein. Cast-iron pipe and copper tubing shall be installed in accordance with AWWA-C-600 except as modified herein. P.V.C. Plastic Pipe shall be installed in accordance with ASTM D2321 and in accordance with the pipe manufacturer's printed instructions.

#### 5.6 Joints:

5.6.1 Joints for asbestos-cement pipe shall be made with couplings and sealing rings. Joints between asbestos-cement pipe and cast-iron fittings shall be push-on joints or mechanical joints. Sealing rings as specified hereinbefore shall be used with push-on joints; gaskets for mechanical joint shall conform to ANSI A21.11 (AWWA C111).

5.6.2 Joints for Cast-Iron Pipe: Push-on and mechanical joints shall be made in accordance with the requirements of AWWA C 600; mechanical joints shall further follow the "Notes on Installation of Mechanical Joints" given in ANSI A21.11 (AWWA C111). Flanged-joints shall be made up tight, care being taken to avoid undue strain on flanges, valves, fittings, pump nozzles, and other equipment and accessories.

5.6.3 Joints for Copper Tubing: Copper tubing shall be cut with square ends, and all burrs and fins removed. Tubing shall be handled carefully and all tubing dented, gouged, or otherwise damaged shall be replaced with undamaged tubing. Solder joints shall be made using 50-50 lead-tin solder. End of tubing and inside of fitting or coupling shall first be cleaned with wire brush or abrasive. A rosin flux shall then be applied to the tubing end and on the recess inside of fitting or coupling. Tubing end shall then be inserted to the full depth of the recess and soldered. For compression joints on flared tubing, the tubing shall be inserted through the coupling nut and flared with an approved flaring tool.

5.7 Connections to New Water Mains: Water lines 1-1/2-inch size and smaller shall be connected to the main by a corporation stop and a lead or copper gooseneck, and shall have a gate valve located below the frostline, unless otherwise indicated. Water lines 2-inch size shall be connected to the main with a rigid connection or a corporation stop and lead or copper gooseneck, and shall have a gate valve located below the frostline, unless otherwise indicated. Water lines larger than 2-inch size shall be connected to the main by a rigid connection and shall have a gate valve located below the frostline, unless otherwise indicated.

5.8 Connections to Existing Water Supply Systems: Tapping or drilling machine valve and sleeves shall be used for connections to be made under pressure. The sleeves shall be bolted around the mains and

caulked; the valve bolted to the branch. The valve shall conform to the latest specification for valves of the American Water Works Association. The valve shall be opened, the drilling machine attached; the tap made, the valve closed and the drilling machine removed all without interruption of service. The Contractor shall furnish all material required to make connections into the existing water supply systems; and shall perform all necessary excavating, backfilling and other incidental labor as required. The Contractor shall furnish the labor and the tapping or drilling machine for making the actual connections to the existing systems. The Contracting Officer shall be notified in writing at least ten days prior to the date the connections are required. Approval by the Contracting Officer shall be received before any service is interrupted.

5.9 Pipe Anchorage: Anchorage of buried pipe lines shall be by means of concrete thrust blocks (reaction backing), using concrete with a minimum compressive strength of 2000 psi. All 1/16 and sharper bends, tees, and dead ends of pipe shall be securely blocked in the direction of flow with poured-in-place concrete bearing solidly against the pipe and affording a minimum of 3 square feet of bearing area against a vertical trench face for 3- and 4-inch pipe, and in accordance with LANTDIV Plate WD-1 for piping 6-inch diameter and larger. Plate WD-1 appears at the end of this section.

5.10 Setting Valves and Valve Boxes: Valves and valve boxes shall be set plumb, and centered, with valve boxes placed directly over the valves. Valve boxes shall, if possible, be located outside the area of the roads and streets. Earth fill shall be carefully tamped around the valve box to a distance of 4 feet on all sides of the box, or to the undisturbed trench face if less than 4 feet. Valves shall have the interiors cleaned of all foreign matter before installation. Stuffing boxes shall be tightened and the valve shall be inspected in opened and closed positions to see that all parts are in working condition.

5.11 Wire Tracer for Nonmetallic Pipe: The full length of runs of nonmetallic pipe, if used, shall be provided with a continuous bare copper or aluminum wire, not less than 0.10 inch in diameter, which will provide means of location of pipes with an electronic metal detector applied at the ground surface above the pipe. Wire shall be secured to the pipe sufficiently to insure that the wire remains in place during construction operations.

5.12 Warning Tapes in Earth Trenches: For the purposes of early warning and identification of buried pipes during future trenching or other excavation continuous identification tapes shall be provided in the trench. Tape shall be non-metallic plastic tape or aluminum foil plastic backed tape manufactured for the purpose of early warning and identification of utilities buried below the tape. Tape shall be at least three inches in width. Color of tape shall be as standard with the manufacturer with respect to the type of utility buried below the tape. Tape shall have lettering at least one inch high with not less than the following identification on the tape: "BURIED WATER LINE BELOW": Tape shall be installed in accordance with the printed recommendations of the tape manufacturer, as modified herein. Tapes shall be buried at a depth of 6 inches below the top of the subgrade.

6. DISINFECTION: New water piping and existing water piping affected by Contractor's operations shall be disinfected in accordance with AWWA C601. Piping system shall be filled with solution containing minimum of 50 parts per million of available chlorine and allowed to stand for minimum period of 24 hours. Solution shall be flushed from system with clean water until maximum residual chlorine content is not greater than 0.2 parts per million.

7. IDENTIFICATION TAGS AND PLATES: Valves shall be provided with tags or plates numbered and stamped for their usage. Plates and tags shall be of brass or suitable nonferrous material and shall be securely mounted or attached.

8. FIELD TESTING AND INSPECTION:

8.1 General: All work shall be proved to be in first class condition and constructed properly in accordance with the drawings and specifications. All defects and leaks disclosed by the tests shall be corrected. Piping shall not be completely buried, covered, or concealed until it has been inspected, tested, and approved, except when procedure is modified by the referenced installation and testing standard.

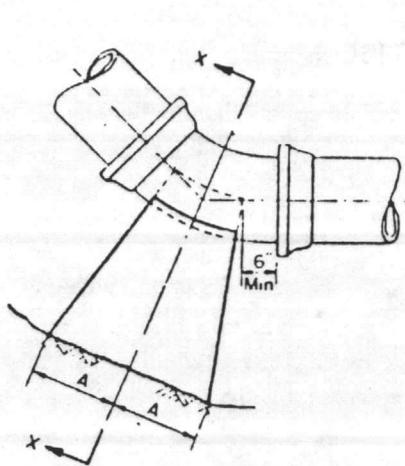
8.2 Field Tests: Testing procedures shall be as specified hereinafter for the respective kind of piping. On those distribution systems utilized for fire hydrants, sprinkler systems, or other fire protection purposes, hydrostatic pressure for pressure test shall be 50 psi in excess of the maximum working pressure of the system, but shall be not less than 200 psi and shall be held for a period of not less than 2 hours. For other systems, hydrostatic pressure for pressure test shall be 50 percent in excess of the maximum working pressure of the system, but shall be not less than 100 psi and shall be held for a minimum of one hour. Prior to the pressure test, that portion of the water line being treated shall be filled with water for a soaking period of not less than 24 hours. Hydrostatic pressure for leakage test for all systems shall be the maximum working pressure of the system, except as otherwise specified hereinafter. Leakage test may be performed at the same time and at the same test pressure as the pressure test. Pipe, joints, valves and fittings in the test section shall be examined. Equipment shall be tested in operation to demonstrate compliance with specification requirements. Each hydrant and all control valves shall be fully opened and closed under water pressure. Appliances, water and equipment for testing shall be furnished by the Contractor at his own expense, and the systems tested until proved satisfactory. The Contractor shall submit a certificate similar to that specified in NFPA 24 with a request for a formal inspection at least two working days prior to the date the inspection is to take place. At this inspection, any or all of the required tests shall be repeated as required.

8.2.1 Asbestos-cement Pipelines shall be tested in accordance with the applicable provisions of AWWA C 603, except as otherwise specified hereinbefore.

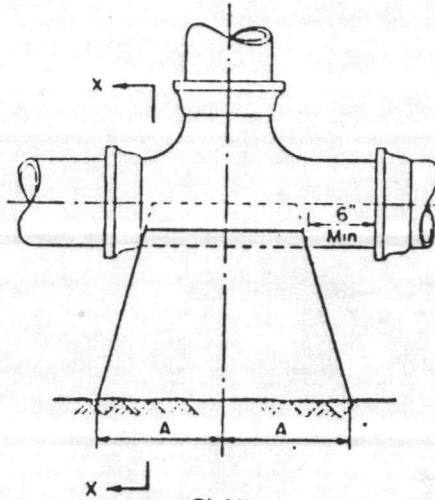
8.2.2 Testing of cast-iron pipelines and copper tubing lines shall be in accordance with AWWA C 600, except as specified otherwise herein.

The amount of leakage on lines with push-on or mechanical joints shall not exceed the amounts given in AWWA C 600. No leakage will be allowed at flanged or soldered joints.

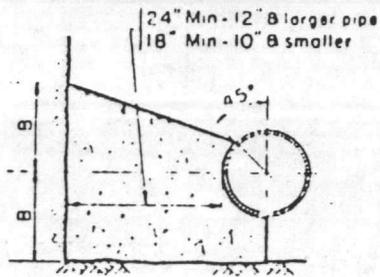
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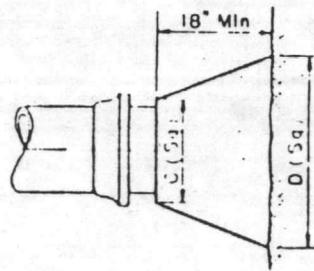
PLAN  
BENDS



PLAN  
TEES



SECTION X-X  
BENDS & TEES



PLAN B ELEVATION  
PLUGS

SIZE	1/4 BENDS		1/8 BENDS		1/16 BENDS		TEES		PLUGS	
	A	B	A	B	A	B	A	B	C	D
6"	16"	10"	9"	10"	6"	8"	10"	12"	10"	21"
8"	22"	13"	12"	13"	8"	10"	13"	16"	12"	29"
10"	26"	17"	14"	17"	10"	13"	16"	20"	14"	36"
12"	29"	21"	16"	21"	11"	16"	18"	24"	16"	41"
14"	35"	24"	19"	24"	12"	20"	22"	27"	18"	48"
16"	38"	27"	21"	27"	12"	24"	24"	30"	20"	54"

NOTE Based on 100 psi static pressure plus AWWA water hammer  
All bearing surfaces to be carried to undisturbed ground

**STANDARD THRUST BLOCKS  
FOR WATER MAINS**

LANTDIV PLATE WD-1

## SECTION 15611

### FUEL OIL HANDLING SYSTEM

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 the basic designation only.

#### 1.1 Federal Specifications (Fed. Spec.):

GG-T-321D	Thermometers, Self-Indicating, Liquid in Glass, for Machinery and Piping Systems
WW-V-54D & Int Am 3	Valve, Gate, Bronze (125, 150, and 200 Pound, Screwed Flanged, Solder end, For Land Use)
WW-P-521G	Pipe Fittings, Flange Fittings and Flanges, Steel and malleable iron, (Threaded Butt Welded), 150 Pound
WW-U-531E	Unions, Pipe, Steel or Malleable Iron, Threaded Connection, 150 and 250 pound

#### 1.2 Military Specifications (Mil. Spec.):

MIL-T-462D	Tank, Liquid Storage, Metal, Fuel-oil, Horizontal
MIL-A-907D	Antiseize Compound, High Temperature (Navy)
MIL-T-5544B & Am 1	Thread Compound, Antiseize, Graphite-Petrolatum
MIL-S-16293F	Strainer, Sediment, Pipeline, Water, Air, Gas, Oil, or Steam
MIL-P-17608B	Pump, Rotary, Power Driven, Viscous Liquid
MIL-G-17713B (YD)	Gage, Liquid Level Measuring, Tank
MIL-M-18294B (YD)	Meter, Fluid Quantity Volumetric
MIL-V-18434B	Valves, Gate, Globe, and Angle, Steel
MIL-V-18436C	Valves, Check: Bronze, Cast-Iron and

	Steel Body
MIL-C-19902A	Cap, Vent, Fuel Storage Tank
MIL-T-22361 & Am 1	Thread Compound, Antiseize, Zinc Dust- Petrolatum
MIL-P-23236	Paint Coating Systems, Steel Ship Tank Fuel and Salt Water Ballast.
MIL-T-52777A	Tanks, Storage, Underground, Glass Fiber Reinforced Plastic
MIL-C-24176	Cement, Epoxy, Metal Repair and Hull Smoothing

1.3 American National Standards Institute (ANSI) Publications:

B16.3-77	Malleable Iron Screwed Fittings, 150 and 300 lb.
B16.5-77	Steel Pipe Flanges, Flanged Valves and Fittings including ratings for class 150, 300, 400, 600, 900, 1500 and 2500
B16.9-78	Factory-Made Wrought Steel Buttwelding Fittings
B16.11-73	Forged Steel Fittings, Socket-Welding and Threaded
B16.18-72	Cast Bronze Solder-Joint Pressure Fittings
B16.22-73	Wrought Copper and Bronze Solder-Joint Pressure Fittings
B16.24-71	Bronze Flanges and Flanged Fittings, 150 and 300 Pound
B16.28-64 (R 1972)	Wrought Steel Buttwelding Short Radius Elbows and Returns
B31.1-77	Power Piping
B31.3-73	Petroleum Refinery Piping
B31.4-74	Liquid Petroleum Transportation Piping Systems

1.4 American Society of Mechanical Engineers (ASME) Publications:

ASME Boiler and Pressure Code:

Section VIII - Pressure Vessels - 1977

Section IX - Welding Qualifications - 1978

1.5 American Society for Testing and Materials (ASTM) Publications:

A53-78 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless Steel Pipe

A120-78 Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless For Ordinary Use

B88-78 Seamless Copper Water Tube

1.6 National Fire Protection Association (NFPA) Publications:

NFPA 30 Flammable and Combustible Liquids Code  
1978

NFPA 31 Installation of Oil Burning Equipment  
1976

1.7 American Welding Society (AWS) Publication:

A5.8-76 Brazing Filler Metal

1.8 Manufacturer's Standard Society of the Valves and Fittings Industry (MSS) Publications:

SP-58-75 Pipe Hangers and Supports - Materials and Design

SP-69-76 Pipe Hangers and Supports - Selection and Application

1.9 Underwriters' Laboratories (UL) Publications:

UL-58-76 Steel Underground Tanks for Flammable and Combustible Liquids

UL 142-78 Standards for Steel Aboveground Tanks for Flammable and Combustible Liquids

UL 842-77 Valves for Flammable Fluids

1.10 American Petroleum Institute (API) Publication:

STD 650-78      Welded Steel Tanks for Oil Storage

1.11 Steel Tank Institute (STI) Publications:

STI-P3            111 E. Wacker Drive Chicago, IL 60601

2.    GENERAL DESCRIPTION: This section includes all fuel oil piping, fuel oil storage tank, and related auxiliary equipment for specified in Section 15011, "General Requirements, Mechanical."

3.    MATERIALS AND EQUIPMENT: Piping shall be steel or copper.

3.1    STEEL PIPING:

3.1.1 Pipe: ASTM A120 or A53 Schedule 80, black steel, seamless.

3.1.2 Threaded and Socket-Welding Fittings: ANSI B16.11 forged steel.

3.1.3 Threaded Fittings: ANSI B16.3, black malleable iron.

3.1.4 Butt-Welding Fittings: ANSI B16.9, Fittings shall be of the same material and weight as piping in which they are installed. Backing rings shall conform to ANSI B31.4 and be compatible with materials being welded.

3.1.5 Flanges and Flange Fittings: ANSI B16.4 steel flanges or convoluted steel flanges which meet the criteria of ASME Code Section VIII. Flange faces shall have integral grooves of rectangular cross section which afford containment for self-energizing gasket material.

3.2    Copper Piping:

3.2.1 Pipe and Tubing: ASTM B88, Type K hard-drawn.

3.2.2 Flanges and Flanged Fittings: ANSI B16.24, Class 150.

3.3    Vent Piping: Zinc-coated steel conforming to ASTM A120 standard weight, with zinc-coated malleable iron fittings conforming to Fed. Spec. WWP-521.

3.4    Valves:

3.4.1 Bronze Gate Valves: Fed. Spec. WW-V-54, Class 125.

3.4.2 Steel Gate Valves: Mil. Spec. MIL-V-18434, oil service, Class 150.

3.4.3 Relief Valves: UL 842, steel or bronze bodies, corrosion-resistant valve seats, and positive closing so that no leakage will occur.

3.4.4 Check Valves: Mil. Spec. MIL-V-18436, Group A, Type I, trim 2, Class 150.

3.5 Piping Accessories:

3.5.1 Flexible Hose: Flexible metal hose, corrugated type with braided wire sheath covering, close-pitch annular corrugations, rated for a working pressure of at least 125 psig, 8-inch minimum live length, flanged end connections, UL listed for flammable liquid service. Metal for hose and braided wire sheath shall be stainless steel, any type of ASTM 300 series.

3.5.2 Unions: Fed. Spec. WW-U-531, Type A, Class 150.

3.5.2.1 Dielectric Unions: Union comprising steel female pipe thread end and copper solder-joint end conforming to dimensional, strength and pressure requirements of Fed. Spec. WW-U-531, Class 1. Steel parts shall be galvanized or plated. Union shall have a water-impervious insulation barrier capable of limiting galvanic current to 1% of the short-circuit current in a corresponding bimetallic joint. When dry, it shall also be able to withstand a 600-volt breakdown test.

3.5.3 Welding Filler Metal: ANSI B31.4 and compatible with the materials to be welded.

3.5.4 Brazing Filler Metal: AWS A5.8, silver base alloy, with melting point not less than 1,100 F.

3.5.5 Hangers and Supports: MSS-SP-58, types as required by MSS SP-69.

3.5.6 Strainers: Mil. Spec. MIL-S-16293 single basket type, with inlet and outlet on the same center line. Cast steel or fabricated steel body, mesh 300-series stainless-steel baskets. Open area of one basket shall be 2-1/2 times inlet or outlet piping area. Furnish one spare basket.

3.5.7 Fill Box: Lock-type design with cast-iron body and bronze inside lock cap, designed for flush mounting in concrete encasement, water-tight with drain holes in bottom. Furnish wrench for opening box.

3.5.8 Gaskets: Provide composition asbestos gaskets for all flanged and bolted connections.

3.6 Instruments: Tank gages Mil. Spec. MIL-G-17713, buoyant force type with direct reading dial. Thermometers Fed. Spec. GG-T-321 mercury type with wells and temperature range suitable for the use encountered.

3.7 Protection for Aboveground Steel Pipe and Steel Tanks: Protect all aboveground steel pipe and tanks against atmospheric corrosion by a prime coat, inorganic, zinc-rich primer in accordance with Mil. Spec. MIL-P-23236, Type I, Class 3, bond or tie coat in accordance with specifications of manufacturer of prime coat and 2 finish coats of vinyl paint in accordance with Steel Structures Painting Council

Specification (SSPC) - Paint 9. Internally coat all aboveground steel storage tanks with capacities in excess of 20,000 gallons in accordance with Section 09872, "Coating Systems, Interior Welded-Steel Tanks (For Petroleum Fuel Storage)." Prior to internal coating as described above, unsealed lap seams shall be sealed with epoxy cement in accordance with MIL-C-24176, Type II. Inaccessible voids shall be filled with epoxy cement prior to application of the coating.

#### 4. FUEL OIL STORAGE TANKS AND ACCESSORIES:

4.1 Fuel Oil Storage Tanks: Construct fuel oil tanks of steel, coated steel to comply with NFPA Pamphlets 30 and 31. Provide openings for fill, vent, oil return, oil level gage. Size vent pipes according to NFPA 30 and 31 but not less than 1-1/4 inches in nominal inside diameter. Vent pipe shall connect to tapping at high end of tank and shall not extend more than one inch into tank.

4.2 Design, Construction and Testing of Fuel Oil Tanks: Horizontal steel tanks, regardless of coating type, Mil Spec MIL-T-462 or UL 58 and Steel Tank Institute (STI P3)

#### 4.3 Connections to Fuel Oil Tanks:

a. Goose-neck type vent caps or type conforming to Mil. Spec. MIL-C-19902.

b. Provide fill lines with removal inlet strainers, Mil. Spec. MIL-S-16293 and lock type fill boxes.

c. Design fuel oil supply and fuel oil return piping to allow for ample tank movement and pipe expansion.

#### 5. INSTALLATION:

5.1 General Installation Requirements for Oil Piping: Install piping free from traps to drain toward tank or equipment in out-of-the way or unimportant places, and in a manner that will minimize cutting of beams, girders, columns, or load-bearing members. Installation of oil piping and equipment in buildings shall conform to NFPA 31, except as indicated or specified herein. Feed line to equipment shall have a gate valve located near tank.

5.2 Pipe Sleeves: Provide pipe sleeves where pipes and tubing pass through masonry or concrete walls, floors, roogs, and partitions. Sleeves in outside walls below and above grade, in floor, or in roof slabs, shall be steel pipe. Sleeves in partitions shall be zinc-coated sheet steel having a nominal weight of not less than 0.906 pound per square foot. Space between pipe, tubing, or insulation and the sleeve shall be not less than 1/4 inch. Hold sleeves securely in proper position and location before and during construction. Provide sleeves of sufficient length to pass through entire thickness of walls, partitions, or slabs. Firmly pack space between the pipe or tubing, and sleeve with oakum and caulk on both ends of sleeve with elastic cement.

5.3 Floor, Wall, and Ceiling Plates: Secure plates to pipes at sleeves in buildings. All plates shall be painted cast-iron malleable iron, or steel.

5.4 Steel Piping: Steel piping 2 inches and smaller shall be threaded or socket-welded. Piping joints shall conform to ANSI B31.4.

5.5 Screwed Joints in Piping: Use cylinder oil and graphite or graphite pipe-joint compound conforming to Mil. Spec. MIL-T-5544 applied to male threads only for making up screwed joints. Red or white lead and zinc compound conforming to Mil. Spec. MIL-T-22361 may be used. Lubricate threaded pipe joints, as well as bolts and studs used on high temperature pipe joints up to 1050 degrees F, with anti-seize compound in accordance with Mil. Spec. MIL-A-907. Piping shall be free from fins and burrs. Ream or file out pipe ends to size of bore and remove chips. Attach screwed flanges by screwing the pipe through the flange, and reface pipe and flange accurately.

5.6 Copper Tubing: Cut with square ends and remove all burrs and fins. Carefully handle and protect tubing. Replace tubing cut, dented, or otherwise damaged with new tubing. Clean outside surface of tubing ends and inside recess of fitting to bright metal with wire brush or abrasive and apply flux to outside surface of tubing ends and on the recess inside of fittings. Insert tubing to the full depth of fitting, then braze. Remove stems and washers of solder-joint type valves before brazing. Brazing procedure qualification shall conform to ANSI B31.3 and preparation and procedures for joints shall be in accordance with ANSI B31.3.

#### 5.7 Welding:

5.7.1 Welding Procedure Specifications: Before any welding is performed, the Contractor shall submit to the Contracting Officer their copies of this welding procedure specification for all metals included in work, together with proof of its qualifications as outlined in ANSI B31.1.

5.7.2 Performance Qualification Record: Before any welder or operator shall perform any welding the Contractor shall also submit to the Contracting Officer three copies of the Welder's Performance Qualification Record in accordance with ANSI B31.1 showing that the welder was tested under the approved procedure specification submitted by the Contractor. In addition the Contractor shall also submit each welder's assigned number, letter, or symbol which shall be used to identify the work of the welder which shall be affixed immediately upon completion of the weld. Welders making defective welds after passing a qualification test shall be given a requalification test and upon failing to pass the test shall not be permitted to work this contract.

5.7.3 Previous Qualifications: Welding procedures, welders, and welding operators previously qualified by test may be accepted for this contract without requalification subject to the approval of the Contracting Officer and provided that all the conditions specified in ANSI B31.1 are met before a procedure can be used.

5.7.4 Welding of Piping: Welding of joints in piping, butt welds, fillet welds, bends, loops, offsets, and cleaning of pipe shall be in accordance with ANSI B31.1.

5.7.5 Quality of Welds: Quality of welds, correction of defects, stress relieving, and preheating shall be in accordance with ANSI B31.1.

5.7.6 Arc Welding and Gas Welding: In accordance with ASME Boiler and Pressure Vessel Codes Section IX.

5.8 Unions and Flanges: Place unions and flanges where necessary to permit easy disconnection of piping and apparatus. Each connection having a screw and valve shall have a union. In long lines inside buildings, place unions and flanges not farther apart than 100 feet, except in pipe lines of welded construction. Unions and flanges shall be as specified.

5.9 Valves: Install valves in positions accessible for operation and repair. Install check valve and a gate valve on suction line of each fuel oil storage tank.

5.10 Aboveground Fuel Oil Tanks: Set aboveground fuel oil tanks on firm foundation of steel conforming to shape of tank, or on heavy angle knees welded to tank.

## 6. FIELD TESTS:

6.1 Tests: Prior to application of test pressure, remove or valve off piping components which may be damaged by test and install a currently calibrated test gage in the system. Maintain test pressure for at least one hour. In the event of leakage, locate and repair leak and repeat test.

6.1.1 Piping Test: Before backfilling of pipe trenches, perform hydrostatic test of fuel oil piping with No. 2 fuel-oil at 1-1/2 times system pressure or 100 psig which ever is greater.

6.1.2 Steel Fuel Oil Storage Tanks: Field-test tanks in accordance with Method A of Manufacturing and Production Tests of UL 142, except that the underground tanks shall be tested for leaks both before and after being placed in the trench. Mechanical calking is not permitted for correcting leaks in tanks.

END OF SECTION

SECTION 15649

DIESEL ENGINES

1. APPLICABLE PUBLICATIONS: The publications listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto:

1.1 Federal Specifications:

L-P-387A & Am 1	Plastic Sheet, Laminated, Thermosetting.
GG-G-76D	Gages, Pressure and Vacuum, Dial Indicating.
HH-I-523C	Insulation Blocks and Pipe Covering, Thermal (Calcium Silicate).
HH-P-46E	Packing; Asbestos, Sheet, Compressed.
QQ-S-698 & Am 3	Steel, Sheet and Strip, Low Carbon

1.2 Military Specifications:

MIL-F-16884G Fuel Oil, Diesel, Marine

1.3 American National Standards Institute (ANSI):

B16.3-77	Malleable-Iron Screwed Fittings, 150 and 300 pounds.
B16.5-77	Steel Pipe Flanges and Flanged Fittings.
B16.9-78	Wrought Steel Butt-Welding Fittings.
B16.11-73	Forged Steel Fittings, Socket-Welding and Threaded.
B31.1-80	Power Piping
SI.4-71	Sound Level Meters.

1.4 American Welding Society (AWS):

D1.1-80 Structural Welding Code, Steel.

1.5 American Society for Testing and Materials (ASTM):

A36-77	Structural Steel.
A53-79	Welded and Seamless Steel Pipe
A120-79	Black and Hot Dipped Zinc-Coated (Galvanized)
A576-79	Welded and Seamless Steel Pipe
A576-79	Steel Bars, Carbon, Hot-Rolled, Special Quality.
D975-75	Diesel Fuel Oils.

1.6 American Society of Mechanical Engineers (ASME):

PTC 26-62            Speed-Governing Systems for Internal  
                          Combustion Engine-Generator Units

1.7 Institute of Electrical and Electronic Engineers (IEEE).

126-1959            Recommended Specification for Speed Governing  
                          of Internal Combustion Engine-Generator Units

1.8 National Fire Protection Association (NFPA):

30-77                Flammable and Combustible Liquids Code  
37-75                Stationary Combustion Engines and Gas Turbines  
70-81                National Electrical Code

1.9 Society of Automotive Engineers (SAE):

J 726C-79           Air Cleaner Test Code.

1.10 Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS)

SP-58-75           Pipe Hangers and Supports - Materials, Design  
                          and Manufacture.  
SP-69-76           Pipe Hangers and Supports - Selection and  
                          Application.

2. GENERAL REQUIREMENTS: Section 15011, Mechanical General Requirements, with the following additions and modifications, applies.

2.1 Description of Work: The work includes providing new diesel engines, and related work. Each engine-pump system shall be complete and ready for operation. Equipment, materials, installation, and workmanship shall be in accordance with applicable requirements of NFPA 30, 37, and 70, except as specified or indicated otherwise. In the NFPA standards referred to herein, the advisory provisions shall be considered to be mandatory, as though the work "shall" had been substituted for "should" wherever it appears; reference to the "authority having jurisdiction" shall be interpreted to mean the Contracting Officer.

2.2 Submittals Required: The submittal requirements of Section 16011, General Requirements, Electrical apply to the following lists.

2.2.1 Manufacturer's Data:

- a. Diesel Engine
- b. Engine Muffler
- c. Insulation
- d. Pipe Hangers and Supports

2.2.2 Shop Drawings and Calculations: Pertaining to the diesel-engines and auxiliary equipment.

a. Certified outline, general arrangement (setting plan), and anchor bolt detail drawings. Drawing shall show the total weight and center of gravity of the diesel engines.

b. General arrangement drawings showing location of all auxiliary equipment in relation to the diesel engines.

c. Piping schematics for fuel oil, lubricating oil, jacket water and cooling water integral with diesel engine.

d. BMEP calculations.

e. Battery sizes and cranking time calculations.

#### 2.2.3 Certified Test Reports:

a. Diesel Engine Shop Tests

2.2.4 Operation and Maintenance Manual: Within 60 days after all shop drawings have been approved, a complete set of operation and maintenance instructions shall be submitted for approval.

#### 2.2.5 Certificates of Compliance:

a. Pipe and Fittings

### 3. DIESEL ENGINES AND ACCESSORIES:

3.1 Engines: Engines shall be 4-cycle, vertical in-line or vertical "V" type. The engine shall be designed and constructed so as to eliminate undue heating, vibration, and wear. Engines shall be capable of satisfactory burning diesel fuel oil conforming to ASTM D975, Grade No. 2-D, and Marine Diesel Fuel Oil conforming to MIL-F-16884 G.

3.1.1 Rating: Each new diesel engine shall have an output shaft brake horsepower (BHP) rating equal to or greater than the BHP rating as indicated on the drawings. The engine BHP rating shall be acceptable only if the following limiting engine operation parameters are not exceeded to obtain this rating:

Maximum brake mean effective pressure, pounds per square inch: 150 @ 1750 revolutions per minute.

Maximum engine speed, revolutions per minute: 1750

The output shaft brake horsepower rating of each diesel engine shall be based upon consumption of diesel fuel oil, conforming to ASTM D 975, Grade No. 2-D, at conditions of elevation of mean sea level and an atmospheric dry bulb temperature of 85 degrees F. with engine cooled by a liquid mixture of 50 percent by volume of water and 50 percent by volume of ethylene glycol in the radiator system specified.

3.1.2 Duty: Each diesel engine shall have a continuous (prime) duty rating in that it shall be capable of operating continuously at the

rated output shaft brake horsepower for a run of at least 2000 hours without interruption.

3.1.3 Nonoperating Protection: When the diesel engine is not operating, it shall be protected so as not to be damaged by ambient temperatures of 125 to 10 degrees Fahrenheit within the engine rooms.

3.1.4 Air Pollution Control: Each set shall comply with all Federal regulations governing the control of air pollution, as applicable on the date of manufacture.

3.1.5 Combustion Air Filters: Each engine shall have oil bath or dry type air cleaners of adequate capacity to remove dust and abrasives from the engine combustion air. The filters shall remove not less than 97 percent of all dust particles of 5 microns and larger.

3.1.6 Engine Lubricating Oil System: The engine lubricating oil systems shall be the full forced-feed type. Each lubricating oil system shall consist of an engine-driven, positive displacement type oil pump, a lubricating oil strainer, a lubricating oil filter, a lubricating oil cooler (if required) and associated piping. The lubricating oil filter shall be the full-flow type, complete with filter element(s). All elements of the lubricating oil system shall be manufactured by, or acceptable to, the engine manufacturer for each engine provided.

3.1.7 Fuel System: The engine fuel systems shall include an engine-driven fuel pump, fuel strainer and filter, and fuel injection system, complete with piping and accessories as specified herein to supply fuel to the engine from the fuel tank. All elements of the fuel system shall be manufactured by, or acceptable to, the engine manufacturer for each engine provided.

3.1.8 Engine Cooling System: Each engine shall have a closed, liquid cooling system complete with engine-driven coolant circulating pump, engine skid-mounted radiator, fan, piping, and controls. Coolant shall be a liquid mixture of water and ethylene glycol, 50% by volume of each. The cooling system shall have sufficient capacity to dissipate not less than the total British thermal units per hour rejected by the engine at 110 percent of rated output when operating under conditions as specified herein. The cooling system shall have a thermostatic control to maintain optimum engine operating temperatures. The filler cap shall provide for pressure relief prior to removal.

3.1.9 Exhaust System: Each engine shall have a complete exhaust system, including exhaust manifold with fittings and accessories.

3.1.10 Speed Governing System: Set shall have an engine speed droop governing system, mechanical or hydraulic type, capable of maintaining the engine speed within a tolerance of plus or minus 0.5 percent of 1750 revolutions per minute when pump is carrying any constant load between no load and the rated capacity load.

Governing system shall be capable of maintaining the engine speed with tolerance of plus or minus 5 percent of 1750 revolutions per

minute when pump loading changes from no load to rated capacity load, and vice versa.

3.1.11 Cranking System: Electric starting of each diesel shall be provided, complete with alternator, jacket water heater, battery charger, all appurtenances and mechanisms necessary for manual start-manual stop operation of the diesel engine. Engine cranking system shall be activated by push buttons on the engine control panel. Storage batteries shall be sized by the manufacturer to provide not less than 5 minutes of total cranking time intermittently applied during a twenty-four minute period at zero degrees F., while retaining a battery voltage of 1.0 volt or more per cell. The specific gravity of electrolytic shall not exceed 1.250. The batteries shall be complete with connectors, connector terminals, acid resistant racks and one filling of electrolyte. Battery charger shall be supplied with 110V.A.C. and have output of 12 VDC with adjustable 2 to 5 amps and negative battery ground system. An engine mounted, thermostatically controlled immersion type engine coolant heater shall be provided to insure a minimum coolant temperature of 120°F in a minimum room ambient of 32°F. The heater shall be suitable for operation on 120 volts, single phase, AC power. Controls shall be suitable for operation at 120 VAC, single phase.

3.1.12 Engine Protective Devices: The diesel engine battery shall provide power to operate visual annunciators audible alarms.

3.1.12.1 Engine Safety Shutdown: Provide devices that shut off engine's air or fuel supply or both upon the following shutdown conditions: high engine coolant temperature and low engine oil pressure and engine overspeed. The overspeed sensing device shall be mounted on the engine, easily accessible, and shall directly measure each engine's speed. Belt connections shall not be allowed. The overspeed system shall operate independently of the engine's speed governing system. When the engine's speed reaches or exceeds 110 percent of synchronous speed, the overspeed sensing device shall react to shut off the engine's air or fuel supplies or both and shall trip the generator's main circuit breaker.

3.1.12.2 Visual Annunciator: Provide visual indicators on engine control panel that annunciate each engine safety shutdown when each occurs: high coolant temperature, low oil pressure, and overspeed. Visual indicator shall also indicate which safety shutdown occurred first. Label each indicator as specified herein. Provide indicators with manual reset.

3.1.12.3 Pre-Shut Down Alarm: Provide pre-shutdown alarm devices that sense alarm conditions of high coolant temperature, and low oil pressure and upon such alarm conditions shall activate audible alarm and visual indicator at engine control panel. Provide at engine control panel labeled visual indicators one for each pre-shutdown alarm condition, that are activated also by each pre-shutdown alarm device. The indicators specified in the paragraph, "Visual Annunciators" may be also used to indicate pre-shut down alarm indicate pre-shut down alarm conditions. Visual indicators shall also indicate which pre-shut down alarm condition occurred first. Provide these indicators with manual reset. Audible

alarms shall have the following components: Alarm capable of producing a sound output rating of at least 85 decibels at 10 feet distance, audible alarm silencing switch, and automatic reset.

3.1.13 Engine Control Panel: An engine control panel complete with cabinet and accessories shall be provided for each engine. The cabinet shall be the enclosed type fabricated of not lighter than 10 gage sheet steel. The cabinets shall be constructed with angle iron framework if required for proper stiffness and support. The gage panel shall be mounted on the engine unit base. Isolation mounting material shall be used between the base and the control panel to isolate the panel from engine vibrations. All panel-mounted instruments and gages shall be provided with ID plates as specified herein. Piping and tubing as required to connect gages shall be provided. Components provided on each engine control panel shall include the following:

3.1.13.1 Pressure Gages: Pressure gage materials shall conform to GG-G-76, minimum of 2 inches diameter, with silver or white dials and black markings. Duplex gages shall be of the two Bourdon tube style; gages for all other services shall be of the single Bourdon tube style. Gages shall be provided with shut-off needle valves and suitable pressure snubbers. Gages shall be provided to indicate operating parameters including the following indications:

- a. Engine fuel oil pressure
- b. Engine jacket water temperature
- c. Engine lubricating oil pressure
- d. Engine lubricating oil temperature

3.1.13.2 Indicating Tachometer: The tachometer shall be an electronic type or mechanical type driven by the crankshaft through a flexible shaft. Electronic type tachometer, if provided, shall be complete with magnetic pick-up on engine, control signal, transformer, and indicator. The indicator shall be the direct-reading type with a dial minimum 4 inches in diameter and graduated in revolutions per minute. The instrument shall be accurate within 2 percent plus or minus over the entire range of engine speed permitted by the governor. The tachometer face shall be marked to indicate the synchronous rpm.

3.1.13.3 Visual Indicator Lights

3.1.13.4 Audible Alarm

3.1.14 Mounting Base: If the new diesel engines do not utilize existing mounting bases (engine skids) the new diesel engines shall be factory mounted on a common base fabricated of structural steel section. The structural base shall be of the skid type and shall have adequate strength and rigidity to maintain alignment of the equipment mounted thereon without dependence on a concrete foundation. Steel used in fabrication of the mounting base shall be free from sharp bends and corners. The base shall be located so that, when the equipment is

hoisted, adequate clearance will exist between lifting slings and all exterior parts of the equipment. A diagram showing the lifting attachments shall be inscribed in a zinc base alloy or stainless steel plate securely fastened to the outside of the unit with the lifting capacity of each attachment marked thereon. On the diagrammatic plate, a silhouette of the equipment showing the center of gravity shall be provided. Overall limiting dimensions shall be such that the diesel engine and engine skid can be installed at the indicated location and maintain the indicated clearances with surrounding equipment.

3.1.15 Clutch: Provide with each diesel engine a manually operated, twin disc, enclosed clutch designed and construction to meet the rating and duty requirements specified for the engine and to be used for this diesel engine-water pump power transmission application.

4. ENGINE EXHAUST PIPING NOT INTEGRAL WITH THE ENGINES: Provide new as follows:

4.1 Exhaust Mufflers: A residential class muffler shall be provided for each engine which will reduce the exhaust sound spectrum to, or below, the following listed levels when measured with a sound level meter conforming to ANSI Sl.4 at a 75 foot radius from the outlet, with engine loaded to full load and clear weather. Inlet and outlet connections shall be flanged and conform to drilling dimensions of ANSI B16.5, Class 150 or 300.

<u>FREQUENCY BAND IN HERTZ</u>	<u>SOUND LEVEL DECIBELS</u>
20 - 75	78
75 - 150	68
150 - 300	60
300 - 600	53
600 - 1,200	48
1,200 - 2,400	44
2,400 - 4,800	42
4,800 - 10,000	41

4.2 Exhaust Piping: Shall be schedule 80 black steel pipe conforming to ASTM A53 or A120. Piping 2 inches and smaller shall have threaded fittings. Piping 2.5 inches and larger shall have welding fittings. Threaded fittings shall conform to ANSI B16.3, Class 300. Welding fittings shall conform to ANSI B16.9 of the same material and weight as the piping in which they are installed. Welding shall be in accordance with ANSI B31.1, including qualification of welders. Certifications of each welder's qualifications shall be submitted to the Contracting Officer. Multiple-ply corrugated stainless steel flexible

piping connectors shall be provided at the exhaust piping connection to diesel engine. Flanges shall be provided for final connections to diesel engines, exhaust mufflers and flexible connections. Gaskets shall be 0.06 inch thick packing conforming to HH-P-46. Provide rain caps on exhaust piping outlets that are capable of excluding driving rain from entering exhaust piping.

4.3 Insulation: Exhaust piping inside the buildings shall be insulated with calcium silicate insulation conforming to HH-I-523, Type II, Class A, 1.5-inches thick. Insulation shall be protected by a 0.016 inch thick aluminum jacket with a factory applied moisture barrier and secured by aluminum straps or screws spaced 8 inches on centers.

5. PIPE HANGERS AND SUPPORTS: Shall be provided and shall conform to MSS SP-58 and SP-69. Exhaust piping shall have adjustable pipe hangers Type 1 or Type 6, with insulation protector Type 40. Support rods shall be steel. The finish of pipe hangers and supports shall be painted with aluminum paint.

6. MUFFLER SUPPORT AND WALL THIMBLE:

6.1 Materials: Materials shall be in accordance with the following specifications and standards as applicable:

<u>MATERIAL</u>	<u>SPECIFICATION</u>
Structural steel-plates, shapes and tubes	ASTM A36
Carbon steel-bars, hot rolled	ASTM A576
Carbon steel-sheets and strips	QQ-S-698
Steel Pipe-welded and seamless	ASTM A53

6.2 Construction: Welding shall conform to AWS D1.1 and shall be accomplished so as to prevent permanent distortion of connected parts. Connections shall conform to the Minimum Standard Connections as indicated in AISC Steel Construction Manual.

7. PAINTING: Provide painting as specified for painting of equipment in the section, Electrical General Requirements.

8. SPECIAL WRENCHES AND TOOLS: Wrenches and tools specifically designed and required to work on the new equipment, which are not commercially available as standard mechanic's tools, shall be furnished to the Contracting Officer.

9. INSTRUCTING OPERATING PERSONNEL: Upon completion of the work on the first engine installation and at a time designated by the Contracting Officer, the services of a competent engineer regularly employed by the diesel engine manufacturer shall be provided for a period of not less than one 8-hour working day for the instruction of the Government operating personnel in the proper operation and maintenance of the equipment.

10. IDENTIFICATION (ID) PLATES AND TAGS: Provide plates and tags sized so that inscription is readily legible to operating or

maintenance personnel and securely mounted to or attached in proximity of their identified controls or equipment. Lettering shall be normal block lettering, a minimum of 0.25 inches high.

10.1 Materials: ID plates and tags shall be constructed of 16 gauge minimum thickness bronze or stainless steel sheet metal engraved or stamped with inscription. Plates and tags not exposed to the weather or high operational temperature of the diesel engine shall be constructed may be constructed of laminated plastic, 0.125 inch thick melamine plastic conforming to Fed. Spec. L-P-387, matte white finish with black center core, with lettering accurately aligned and engraved into the white core.

10.2 Control Devices and Operation Indicators: Provide ID plates or tags for all provided control devices and operation indicators, including valves, off-on switches, visual, alarm annunciators, gages and thermometers, that are required for operation and maintenance of provided mechanical systems. Plates or tags shall be minimum of 0.5 inch high and 2 inches long and shall indicate component system and component function.

10.3 Equipment: Provide ID plates of a minimum size of 3 inches high and 5 inches long on provided equipment indicating the following information:

- a. Manufacturer, type and model number.
- b. Contract number and accepted date.
- c. Capacity or size.
- d. System in which installed.
- e. System which it controls.

11. TESTING SUPERVISION: The Contractor shall furnish the services of a qualified installation engineer or technician regularly employed by the diesel engine manufacturer to supervise the field testing of each diesel engine, and auxiliaries.

11.1 Initial Start-Up: After the installation is complete, the installation engineer shall conduct a final pre-start check. He shall inspect each diesel engine, fuel supply systems, controls, and all auxiliary equipment. The installation engineer shall conduct the initial start-up and shall check each engine for normal operation.

11.2 Test: The installation engineer shall be present for the final test of the diesel engine. During the test, the installation engineer shall conduct the tests specified in the paragraph entitled "Diesel Engine Tests" and shall provide the Contracting Officer with a written test report showing the tests performed and the results of each test.

## 12. TESTS AND INSPECTIONS:

12.1 Shop Tests: Shop tests shall be performed on each complete shop assembled diesel engine prior to shipment. The Contractor shall provide the Contracting Officer with certified copies of all manufacturers' shop test data and results. All equipment necessary for tests shall be provided by the manufacturer performing the tests, and all measuring and

indicating devices shall be certified to be within calibration or correction data furnished for the device.

12.1.1 Hydrostatic Tests: Hydrostatic test shall be performed to assure that water seals and water jackets are water tight. Test report shall indicate that test was performed, pressure at which test was made and results.

12.1.2 Diesel Engine Load Test: Shall be placed in continuous operation without stoppage for a period of not less than four hours. During this period, the diesel generator unit shall be operated one hour at each load point of half, three-quarter, full load and 110 percent of rated load. If stoppage becomes necessary during this period, the 4-hour run shall be repeated. The following data shall be recorded at the start, at 15 minute intervals and at the end of each load level run.

- a. Fuel consumption.
- b. Exhaust temperatures.
- c. Jacket water temperatures.
- d. Lube oil temperatures and pressures.
- e. Crankcase vacuum.
- f. Rpm's

12.1.3 Certified Test Reports: Provide test reports, certified by diesel engine manufacturer, which includes the following:

- a. Data specified hereinbefore for shop tests
- b. List of and description of test equipment and test data measuring instruments used in shop tests and calibration dates for test data measuring instruments.
- c. Statements by each shop test director that the test results and data meets the manufacturer's recommended limits and is acceptable to the test directors.

12.1.4 Shipment of Equipment: Contractor shall not commence shipment of the equipment to the project site without having Contracting Officer's approval of the shop test reports.

12.2 Field Tests and Inspections: After each engine installation is complete, the installation engineer shall conduct the following field tests and inspections. All equipment, apparatus and consumables necessary for the tests shall be provided by the Contractor. All defects disclosed by the tests shall be corrected by the Contractor without additional cost to the Government.

12.2.1 Piping Tests: New fuel oil piping system shall be tested with fuel oil at working pressure after the lines have been cleaned. The

required test pressure shall be maintained for a sufficient length of time to enable an inspection to be made of all joints and connections. All defects which develop during testing shall be corrected, and the piping systems shall be retested until they show no defect or weakness and are tight.

12.2.2 Preliminary Operation: All motors shall be dried out before operation as required to develop and maintain proper and constant insulation resistance. The engine shall be operated for a period of time sufficient to assure that the unit is ready to carry the load specified herein without damage to any of the engine parts. During this preliminary operation, the Contractor and installation engineer shall check the operation of all auxiliary equipment furnished under this contract to determine that it is functioning properly, and the Contractor shall make such adjustments to all equipment as are necessary to place it in first class operating condition in conformance with the contract requirements.

12.2.3 Diesel Engine Tests: He shall give two weeks advance notice to the Contracting Officer, in writing, that the diesel engine and auxiliary equipment are ready and engine field tests. These tests shall include the following:

a. Each diesel engine shall be operated loaded to the full load. The load state shall be maintained on the diesel engine for a period sufficient for all operating parameters to stabilize. Observe and record diesel engine operating parameters including oil temperature and pressure, coolant temperature and rpm, to verify all values are within manufacturers recommended limits.

b. Test to verify generating unit speed regulation under a gradual change from zero to full load.

c. Test to assure proper functioning of the overspeed trip.

d. Individual test of each alarm and prealarm switch to verify correct operation of the visual indicator and alarm system.

12.2.4 Test Report: Upon completion of field testing of each engine diesel installation, the erection engineer shall prepare a test report indicating the tests performed and the test data and test results of those tests. The report shall include a list of and description of test equipment and test data measuring instruments and calibration dates for these test data measuring instruments. The installation engineer shall make the statement on the test report that the test data taken from the diesel engine falls within the manufacturer's recommended limits the diesel engine installation is acceptable to him. The report shall be dated, signed and given to the Contracting Officer. This report will not constitute automatic acceptance of the installation by the Government but will be used only to verify that in the opinion of the installation engineer, as a representative of the diesel generator manufacturer, the installation is in excellent operating condition.

END OF SECTION

05-80-0399  
15649-11

## SECTION 16011

### ELECTRICAL GENERAL REQUIREMENTS

#### 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 the basic designation only.

##### 1.1.1 Federal Specifications (Fed. Spec.):

TT-E-489F & Am 1	Enamel, Alkyd, Gloss (for Exterior and Interior Surfaces)
TT-E-496B & Am 2	Enamel, Heat-Resisting (400 Degrees Fahrenheit), Black
TT-P-645A	Primer, Paint, Zinc-Chromate, Alkyd Type

##### 1.1.2 Military Specifications (Mil. Spec.):

DOD-P-15328D	Primer, (Wash), Pretreatment (Formula No. 117 for Metals) (Metric)
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##### 1.1.3 American Society for Testing and Materials (ASTM) Publication:

B117-73 (R79)	Salt Spray (Fog) Testing, Method of
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1.2 APPLICATION: This section applies to all sections of Division 16, "Electrical" of this project except as specified otherwise in each individual section.

1.3 SUBMITTALS: Submit shop drawings, manufacturers data and certificates for equipment, materials and finish, and pertinent details for each system where specified in each individual section, and have them approved before procurement, fabrication or delivery of the items to the job site. Partial submittals will not be acceptable and will be returned without review. Submittals shall include the manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable Federal, Military, industry and technical society publication references, and other information necessary to establish contract compliance of each item the Contractor proposes to furnish.

1.3.1 Shop Drawings: Drawings shall be a minimum of 8.5-inches by 11-inches in size, except as specified otherwise. Drawings shall include floor plans, sectional views, wiring diagrams, and installation details of equipment; and equipment spaces identifying and indicating proposed location, layout and arrangement of items of equipment, control panels, accessories, piping, ductwork, and other items that must be

shown to assure a coordinated installation. Wiring diagrams shall identify circuit terminals, and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance and replacement of operating equipment devices. If equipment is disapproved, drawings shall be revised to show acceptable equipment and be resubmitted.

1.3.2 Manufacturer's Data: Submittals for each manufactured item shall be manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts.

1.3.3 Publication Compliance: Where equipment or materials are specified to conform to industry and technical society publications of organizations such as American National Standard Institute (ANSI), American Society for Testing and Materials (ASTM), and Underwriters' Laboratories, Inc. (UL), proof of such compliance shall be submitted. The label or listing by the specified organization will be acceptable evidence of compliance. Submit a certificate from an independent testing organization adequately equipped and competent to perform such services, and approved by the Contracting Officer, stating that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's publication.

1.3.4 Certified Test Reports: The testing requirements in referenced publications for materials will be waived provided the manufacturer's original certificates are submitted stating that previously manufactured materials have been tested by approved laboratories, that such materials meet testing requirements specified, and that the materials furnished for this project are of the same type, quality, manufacture, and make as that specifically requested by the Contracting Officer.

1.3.5 Certificates of Compliance: Submit certification attesting that materials and equipment to be furnished for this project comply with the requirements of this specification and of the reference publications. Pre-printed certifications will not be acceptable; certifications shall be the manufacturer's original. The certification shall not contain statements that could be interpreted to imply that the product does not meet all requirements specified, such as "as good as"; "achieve the same end use and results as materials formulated in accordance with the referenced publications"; "equal or exceed the service and performance of the specified material". The certification shall simply state that the product conforms to the requirements specified.

1.4 DELIVERY AND STORAGE: Properly store, adequately protect and carefully handle equipment and materials to prevent damage before and during installation. Handle, store, and protect equipment and materials in accordance with the manufacturer's recommendations. Replace damaged or defective items.

1.5 CATALOGED PRODUCTS: Materials and equipment shall be cataloged products of manufacturers regularly engaged in production of such materials or equipment and shall be manufacturer's latest design that

complies with the specification requirements. Materials and equipment shall duplicate items that have been in satisfactory commercial or industrial use. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the items need not be the products of the same manufacturer. Each item of equipment shall have the manufacturer's name, address, model number and serial number on the nameplate securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

1.6 VERIFICATION OF DIMENSIONS: Coordinate the proper relation of the work to the building structure and to the work of all trades. Visit the premises and become familiar with the dimensions in the field, and advise the Contracting Officer of the discrepancy before performing any work.

1.7 MANUFACTURER'S RECOMMENDATIONS: Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Contracting Officer prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

1.8 ELECTRICAL REQUIREMENTS: Furnish motors, controllers, contactors, and disconnects with their respective pieces of equipment. Motors, controllers, contactors, and disconnects shall conform to and shall have electrical connections provided under Section 16402, "Interior Wiring Systems". Furnish internal wiring for components of packaged equipment as an integral part of the equipment. Extended voltage range motors will not be permitted. Controllers and contactors shall have a maximum of 120 volt control circuits. When motors and equipment furnished are larger than sizes indicated, the cost of additional electrical service and related work shall be included under the section that specified that motor or equipment. Power wiring and conduit for field installed equipment, shall be provided under and conform to the requirements of Section 16402, "Interior Wiring Systems".

## PART 2 - EXECUTION:

2.1 PAINTING OF EQUIPMENT: Equipment painting, factory applied or shop applied, shall be as specified herein, and provided under each individual section of this specification.

2.1.1 Factory Painting Systems: Manufacturer's standard factory painting systems may be provided subject to certification that the factory painting system applied will withstand 125 hours in a salt-spray fog test, except that equipment located outdoors shall withstand 500 hours in a salt spray fog test. Salt spray fog test shall be in accordance with ASTM B117. Immediately after completion of the test, the paint shall show no signs of blistering, wrinkling or cracking; and no loss of adhesion; and the specimen shall show no signs of rust creepage beyond 0.125 inch on either side of the scratch mark. The film thickness of the factory painting system applied on the equipment shall not be less than the film thickness

used on the test specimen. If manufacturer's standard factory painting system is being proposed for use in lieu of the shop painting systems using Fed. Spec. TT-E-496, certifications that the manufacturer's standard factory painting system will conform to the heat resistance requirement of Fed. Spec. TT-E-496 shall be submitted in addition to other certifications.

2.1.2 Shop Painting Systems: Clean, pretreat, prime and paint metal surfaces; except aluminum surfaces shall not be painted. Apply coatings to clean dry surfaces. Clean the surfaces to remove dust, dirt, rust, oil and grease by wire brushing and solvent degreasing prior to application of paint, except metal surfaces subject to temperatures in excess of 120 degrees Fahrenheit (F) shall be cleaned to bare metal. Where more than one coat of paint is specified, apply the second coat after the preceding coat is thoroughly dry. Lightly sand damaged painting and retouch before applying the succeeding coat.

2.1.2.1 Metal Surfaces Subject to Temperatures Less Than 120 Degrees F.: Immediately after cleaning, the metal surfaces shall receive one coat of Mil. Spec. DOD-P-15328 pretreatment of primer applied to a minimum dry film thickness of 0.3 mil, one coat of Fed. Spec. TT-P-645 primer applied to a minimum dry film thickness of one mil; and two coats of Fed. Spec. TT-E-489 enamel applied to a minimum dry film thickness of one mil per coat.

2.1.2.2 Metal Surfaces Subject to Temperatures Between 120 and 400 Degrees F.: Surfaces shall receive two coats of Fed. Spec. TT-E-496, Type II, heat-resisting enamel applied to a total minimum thickness of 2 mils.

END OF SECTION.

SECTION 16301

UNDERGROUND ELECTRICAL WORK

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 the basic designation only.

1.1.1 American National Standards Institute (ANSI) Publication:

C2-1981 National Electrical Safety Code (NESC)

1.1.2 American Society for Testing and Materials (ASTM) Publications:

D 698-78 Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5-lb. (2.49-KG) Rammer and 12-in. (305-MM) Drop

D 1556-64 Density of Soil in Place by the Sand Cone Method  
(R 1974)

D 1557-78 Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 10-lb. (4.54 KG) Rammer and 18-inch (457-MM) Drop

1.1.3 National Electrical Manufacturer's Association (NEMA) Publications:

TC6-1978 PVC and ABS Plastic Utilities Duct for Underground Installation

TC9-1978 Fittings for ABS and PVC Plastic Utilities  
(REV 1-78) Duct for Underground Installation

1.1.4 National Fire Protection Association (NFPA) Publication:

70-1981 National Electrical Code (NEC)

1.1.5 Underwriter's Laboratories Inc. (UL) Publications:

6-1976 Rigid Metallic Conduit

467-1972 Grounding and Bonding Equipment  
(1978)

510-1976 Insulating Tape

514-1979 Outlet Boxes and Fittings

854-1979 Service-Entrance Cables

1.2 GENERAL REQUIREMENTS: Section 16011, "Electrical General Requirements" applies to this section with additions and modifications specified herein.

1.2.1 Laboratory Tests;

1.2.1.1 Determine soil density relationships as specified for soil tests in section entitled Earthwork.

1.3 SUBMITTALS REQUIRED:

1.3.1 Shop Drawings (S) or Manufacturer's Data (M).

\* Plastic Conduit (M)

\* Cable Lubricants (M)

PART 2 - PRODUCTS:

2.1 MATERIALS AND EQUIPMENT: Provide materials and equipment listed by UL or approved by Factory Mutual (FM) System, when such equipment is listed or approved.

2.1.1 Conduit: Conduit shall be rigid hot-dipped galvanized steel or plastic conforming to the following:

2.1.1.1 Rigid galvanized steel conduit fittings shall conform to the requirements of UL 6 for threaded type.

2.1.1.2 Plastic duct for concrete encased burial shall be PVC and shall conform to NEMA TC6, Type EB. Fittings shall conform to NEMA TC9.

2.1.1.3 Outlet boxes for use with steel conduit, rigid or flexible shall be cast-metal cadmium or zinc-coated if of ferrous metal with gasketed closures and shall conform to UL 514.

2.1.2 TAPE: Plastic insulating tape shall conform to the requirements of UL 510.

2.1.3 WIRE AND CABLE:

2.1.3.1 Wire and cable conductor sizes are designated by American Wire Gauge (AWG). Conductor and conduit sizes indicated are for copper conductors, unless otherwise noted. Insulated conductors shall bear the date of manufacture imprinted on the wire insulation with other identification. Wire and cable manufactured more than 6 months before delivery to the job site shall not be used.

2.1.3.2 Conductors rated 600 volts and less, including service entrances, shall conform to UL 854, Type USE. Conductors shall be copper. Conductor size and number of conductors in each cable shall be as indicated. Cable shall be color coded. Conductor identification shall be provided within each enclosure where a tap, splice or termination is made. Conductor identification shall be by color coded insulated conductors, plastic coated self sticking printed markers, colored nylon cable ties and plates or heat shrink type sleeves.

Colors for coding conductors shall be:

208 VOLT SYSTEM

Neutral - White  
Phase A - Black  
Phase B - Red  
Phase C - Blue  
Grounding Conductor - Green

PART 3 - EXECUTION

3.1 INSTALLATION: Underground installation shall conform to ANSI C2 and NFPA 70 except as otherwise specified or indicated.

3.1.1 Contractor Damage: The Contractor shall promptly repair any indicated utility lines or systems damaged by his operations. Damages to lines or systems not indicated, which are caused by his operations shall be treated as "Changes" under the terms of the General Provisions of the contract. If the Contractor is advised in writing of the location of a nonindicated line or system, such notice shall provide that portion of the line or system with "indicated" status in determining liability for damages. In any event, the Contractor shall immediately notify the Contracting Officer of any such damage.

3.1.2 Underground Duct with Concrete Encasement: Underground duct lines shall be constructed of individual conduits encased in concrete. Except where rigid galvanized steel conduit is indicated or specified, the conduit shall be of PVC Type EB. The kind of conduit used shall not be mixed in any one duct bank. Ducts shall not be smaller than 2 1/2 inches in diameter unless otherwise indicated. The concrete encasement surrounding the bank shall be rectangular in cross-section and shall provide at least 3 inches of concrete cover for ducts.

3.1.2.1 The top of the concrete envelope shall not be less than 18 inches below grade except that under roads and pavement it shall be not less than 24 inches below grade.

3.1.2.2 Duct lines shall have a continuous slope downward toward underground structures and away from buildings with a pitch of not less than 3 inches in 100 feet. Except at conduit risers, changes in direction of runs exceeding a total of 10 degrees, either vertical or horizontal, shall be accomplished by long sweep bends having a minimum radius of curvature of 25 feet, sweep bends may be made up of one or more curved or straight sections or combinations thereof. Manufactured bends shall have a minimum radius of 18 inches for use with conduits of less than 3 inches in diameter and a minimum radius of 36 inches for ducts of 3 inches in diameter and larger. Trenches shall be excavated along straight lines from structure to structure before ducts are laid or structure constructed so the elevation can be adjusted, if necessary, to avoid unseen obstruction.

3.1.2.3 Partially Completed Duct Lines: During construction wherever a construction joint is necessary in a duct line, prevent debris such as mud, sand, and dirt from entering ducts by providing suitable conduit plugs. Fit concrete envelope of a partially completed duct line

with reinforcing steel extending a minimum of two feet back into the envelope and a minimum of two feet beyond the end of the envelope. Provide one No. 4 bar in each corner, three inches from the edge of the envelope. Secure corner bars with two No. 3 bars, spaced approximately one foot apart, all around. Restrain reinforcing assembly from moving during concrete pouring.

3.1.3 Underground Conduit for Service Feeders: Underground conduit for service feeders into buildings shall be rigid steel from the service equipment to a point 5 feet beyond the building and projections thereof. The ends of the conduit shall be protected by threaded metal caps or bushings; the threads shall be coated with graphite grease or other suitable coating. Conduit shall be cleaned and plugged until conductors are installed. The underground portion of the conduit shall be encased in a concrete envelope and shall be buried as specified for underground duct with concrete encasement.

3.1.4 Concrete: Concrete for electrical requirements shall have a compressive strength of 3000 psi at 28 days with one inch maximum aggregate conforming to the requirements of Section 03300, "Cast-in-Place Concrete".

#### 3.1.5 Reconditioning of Surfaces:

3.1.5.1 Unpaved surfaces disturbed during the installation of duct or direct burial cable shall be restored to their original elevation and condition. Sod or topsoil shall be preserved carefully and replaced after the backfilling is completed. Sod that is damaged shall be replaced by sod of quality equal to that removed. Where the surface is disturbed in a newly seeded area, the restored surface shall be reseeded with the same quantity and formula of seed as that used in the original seeding.

3.1.5.2 Paving Repairs: Where trenches, pits or other excavations are made in existing roadways and other areas of pavement where surface treatment of any kind exists, such surface treatment or pavement shall be restored to the same thickness and in the same kind as previously existed, except as otherwise specified, and to match and tie into the adjacent and surrounding existing surfaces in a neat and acceptable manner.

3.1.6 Cable Pulling: Cable lubricants shall be soapstone, graphite or talc for rubber or plastic jacketed cables.

3.1.6.1 Lubricants for assisting in the pulling of jacketed cables shall be those specifically recommended by the cable manufacture.

3.1.6.2 Cable pulling tensions shall not exceed the maximum pulling tension recommended by the cable manufacturer.

3.1.6.3 Secondary cable runs, 600 volts and less, shall include a copper equipment grounding conductor sized as required by the rating of the overcurrent device supplying the phase conductors.

3.1.7 Earthwork shall be in accordance with Section 02200, "Earthwork".

3.2 Distribution Conductors 600 Volt Class: After wiring is completed and connected ready for operation, but prior to placing systems in service and before any branch circuit breakers are closed, insulation resistance tests shall be made in all circuits. The insulation resistance between conductors and between each conductor and ground shall be measured. Measurements shall be made with an instrument capable of making measurements at an applied potential of 500 volts. Readings shall be taken after the voltage has been applied for a minimum of one minute. The minimum insulation resistance for circuits of No. 12 AWG conductors shall be 1,000,000 ohms. For circuits of No. 10 AWG or larger conductors, a resistance based on the allowable ampacity of the conductor as fixed by NFPA 70 shall be as follows:

25 through 50 amperes .....	250,000 ohms
51 through 100 amperes .....	100,000 ohms
101 through 200 amperes .....	50,000 ohms

3.2.1 Ground Rods: Test ground rods for ground resistance value before any wire is connected. Ground resistance measurements shall be made in normally dry weather, not less than 48 hours after rainfall. Ground resistance shall also be measured for each piece of equipment to the ground electrode. A portable ground testing megger shall be used to test each ground or group of grounds. The instrument shall be equipped with a meter reading directly in ohms or fractions thereof to indicate the ground value of the ground electrode under test. Provide one copy of the megger manufacturer's directions for use of the ground megger indicating the method to be used.

3.2.2 Test Report:

- a. 600 volt cables (identify each cable & test result).
- b. Grounding electrodes & systems (identify electrodes and systems, each test as well as the resistance and soil conditions at the time the measurements were made)

END OF SECTION.

## SECTION 16302

### OVERHEAD ELECTRICAL WORK

#### 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 the basic designation only.

##### 1.1.1 American National Standards Institute (ANSI) Publications:

B16.11-73	Forged Steel Fittings, Socket-Welded and Threaded
C2-81	National Electrical Safety Code
C29.2-77	Wet Process Porcelain Insulators and-Toughened Glass Insulators (Suspension Type)
C29.3-77	Wet Process Porcelain Insulators (Spool Type)
C29.4-77	Wet Process Porcelain Insulators (Strain Type)
C29.5-77	Wet Process Porcelain Insulators (Low and Medium Voltage Pin Type)
C29.7-77	Wet Process Porcelain Insulators (High Voltage Line-Post Type)
C37.32-72	Schedules of Preferred Ratings, Manufacturing Specifications and Application Guide for High Voltage Air Switches, Bus Supports, and Switch Accessories
C37.42-69 (R1974)	Distribution Enclosed, Open and Open-Link Cutouts
C37.43-69 (R1974)	Distribution Fuse Cutout Links for Use in Distribution Enclosed, Open, and Open-Link Cutouts
C57.12.20-74	Overhead Type Distribution Transformers 67,000 Volts and Below: 500 KVA and Smaller, Including Supplement C57.12.20A-78.

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Specifications and Dimensions for Wood  
Poles

1.1.2 American Society for Testing and Materials (ASTM)  
Publications:

- |               |   |
|---------------|---|
| A 120-79      | Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary uses |
| A 153-78      | Zinc-coating (Hot-Dip) on Iron and Steel Hardware   |
| A 475-78      | Zinc-Coated Steel Wire Strand   |
| B 1-70(R1976) | Hard-Drawn Copper Wire  |
| B 2-70(R1976) | Medium Hard-Drawn Copper Wire   |
| B 3-74        | Soft or Annealed Copper Wire  |
| B 8-77        | Concentric-Lay-Stranded Copper Conductors, Hard, Medium Hard, or Soft                             |

1.1.3 American Wood-Preservers' Association (AWPA) Publications:

- |         |  |
|---------|--|
| C.4-77  | Standard for the Preservation Treatment of Poles by the Pressure Process     |
| C.25-76 | Standard for the Preservation Treatment of Crossarms by the Pressure Process |

1.1.4 National Electrical Manufacturers' Association (NEMA)  
Publications:

- |        |  |
|--------|--|
| LA1-76 | Surge Arresters                        |
| TR1-80 | Transformers, Regulators, and Reactors |

1.1.5 National Fire Protection Association (NFPA) Publication:

- |         |                          |
|---------|--------------------------|
| 70-1981 | National Electrical Code |
|---------|--------------------------|

1.1.6 Rural Electrification Administration (REA) Publications:

- |                    |  |
|--------------------|--|
| 44-3<br>(DEC 1975) | Wood Crossarms (Solid and Laminated),<br>Transmission Timbers and Pole Keys<br>(DT-5B/PE-16) |
|--------------------|--|

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Supplements 2 & 3

List of Materials Acceptable for Use on  
Electric Systems of REA Borrowers

1.1.7 Underwriter's Laboratories (UL) Publications:

6-76	Rigid Metallic Conduit
83-79	Thermoplastic-Insulated Wires
510-76	Insulating Tape

1.2 GENERAL REQUIREMENTS: Section 16011, "Electrical General Requirements" applies to the section with additions and modifications specified herein.

1.2.1 Underground Service: Underground service into buildings shall terminate at a point 5 feet outside the building and projections thereof, except that service conductors shall be continuous to the interior terminating point indicated. Connections of the underground service to the panelboard or load center is included in Section 16402, "Interior Wiring Systems." Ends of the underground conduit shall be protected by threaded metal caps until connections are made. Underground service from 5 feet outside the building to the underground terminal pole shall be provided under this section and shall have materials and installation as specified in Section 16301, "Underground Electrical Work."

1.2.2 Electrical Characteristics: Electrical characteristics for this project shall be 12.4 kV primary, three phase, three wire, 60 hertz, delta connected and 120/208 volts secondary, three phase, four wire, wye connected. Final connections to the power distribution system at the existing power poles shall be made by the Contractor as directed by the Contracting Officer.

1.2.3 Connections to Existing Electrical Systems: Notify the Contracting Officer in writing at least 15 days prior to the date the connections are required; approval shall be received before any service is interrupted. Furnish all material required to make connections into the existing systems, and perform all excavating, backfilling, and other incidental labor as required.

1.2.4 Submittals: Submit following information for approval:

1.2.4.1 Catalog Information:

- a. Conductor (list each size and type)
- b. Insulator (list each size and type)
- c. Cutouts
- d. Transformers
- e. Tapes

1.2.4.2 Shop Drawings:

- a. Transformers

1.2.4.3 Manufacturer's Certification:

- a. Transformer tests: Certify that routine tests per NEMA TRI have been made on each transformer.
- b. Copper splices, connectors, lugs & fittings.

1.2.4.4 Manufacturer's Directions:

- a. Copper connection make-up directions
- b. Cable terminations
- c. Manufacturer's directions for use of ground megger with proposed method indicated.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT: Materials specified herein or shown on the contract drawings which are identical to materials listed in REA 43-5 shall be considered as conforming to all requirements.

2.1.1 Poles: Provide wood poles machine trimmed by turning, Douglas Fir or Southern Yellow Pine conforming to ANSI 05.1. Poles must be gained, bored and roofed before treatment. Poles shall be full length pressure treated with Chromated Copper Arsenate (CCA) or Ammoniacal Copper Arsenate (ACA) conforming to AWPA C4. Poles shall be branded by the manufacturer with his mark and date of treatment, height and class of pole, wood species, preservation code, and retention. Place the brand so that the bottom of the brand or disc is 10 feet from the pole butt for poles up to 50 feet long.

2.1.2 Crossarms: Provide solid type wood crossarms conforming to REA DT-5B. Crossarms shall be pressure treated with Chromated Copper Arsenate (CCA) or Ammoniacal Copper Arsenate (ACA). Treatment shall conform to AWPA C25.

2.1.2.1 Provide crossarms braces as indicated on LANTDIV Pole Sketches.

2.1.3 Hardware: Pole line hardware shall be hot dip galvanized conforming to ASTM A 153.

2.1.4 Insulators: Provide wet-process porcelain insulators which are radio interference freed.

- a. Line post type insulators shall be class 57-1L per ANSI C29.7.

- b. Suspension insulators shall be class 2/52-1 per ANSI C29.2.

c. Spool insulators shall be class 53-2 per ANSI C29.3.

d. Guy Strain Insulators shall be class 54-4 per ANSI C29.4 except they shall be fiberglass type when used with underground terminal or when other interference problems exist.

e. Pin insulators shall be class 55-5 per ANSI C29.5.

2.1.5 Conductors: Provide overhead conductors of bare copper of the sizes and types indicated.

2.1.5.1 Solid copper conductors, hard-drawn, medium-hard-drawn, and soft drawn shall conform to ASTM B1, B2, and B3 respectively. Stranded conductors shall conform to ASTM B8.

2.1.6 Guy Strand: Provide high-strength seven-strand steel cable with Class A or B galvanizing per ASTM A 475. Guy strand shall be 7/16 inch in diameter with a minimum breaking strength of 6000 pound.

2.1.6.1 Provide indicated guy terminations designed for use with the particular strand and developing at least the ultimate breaking strength of the strand.

2.1.6.2 Provide round guy guards 8 feet long colored yellow. Material shall be vinyl or PVC and shall be shatter-resistant at sub zero temperatures.

2.1.6.3 Provide thimble eye guy attachment using a lift plate on the down side.

2.1.7 Anchors and Anchor Rods: Provide anchors and anchor rods of hot-dipped galvanized steel. Anchor rods shall be thimble-eye, 3/4 inch diameter by 7 feet long.

2.1.7.1 Plate Type Anchors shall have an area of at least 250 square inches, and shall be rated by the manufacturer for 14000 pounds or more in "loose-dry" soil.

2.1.7.2 Screw type anchors shall be twin 10 inches in diameter with a minimum rating by the manufacturer of not less than 16000 pounds in "loose-dry" soil.

2.1.8 Ground Rods: Provide copperweld type copper-clad steel ground rods at least 3/4 inch in diameter and 10 feet long unless otherwise indicated. Die-stamp each near the top with the name or trademark of the manufacturer and the length of the rod in feet. The rods shall have a hard, clean, smooth, continuous, surface throughout the length of the rod.

2.1.9 Ground Wire: Provide soft-drawn copper wire ground conductors no smaller than No. 6 AWG. Ground wire protectors shall be PVC or half round wood molding.

2.1.10 Surge Arrestors: Provide valve type surge arresters conforming to NEMA LA1 arranged for crossarm mounting. Rating shall be 15 kV.

2.1.11 Fused Cutouts: Provide heavy duty drop-out fused cutouts rated 100 amperes at 14.4 kV ungrounded, conforming to ANSI C37.42. Provide type fuses conforming to ANSI C37.43 with ampere ratings equal to 150 percent of the transformer full load rating. Open link type fuses and fuse cutouts are not acceptable.

2.1.12 Conduit Risers: Provide rigid galvanized steel conduit conforming to UL 6.

2.1.12.1 600 volt secondary riser conductors shall be copper, RHW-USE conforming to UL 83.

2.1.13 Transformers (Pole-Type): ANSI C57.12.20 self-cooled, 65 degrees C continuous temperature rise, mineral oil-immersed type. Transformers shall be rated 10 kVA, 95 kV BIL, 15 kV class for operation on a 12.47 kV delta system. Minimum impedance shall be 2-1/2 percent. Transformers shall have four 2-1/2 percent rated kVA high voltage taps, two above and two below rated primary voltage. Tank finish coat shall be light gray, ANSI Color No. 70.

2.1.14 Electrical Tapes: UL 510 and shall be UL listed for electrical insulation and other purposes in wire and cable splices, terminations, repairs and miscellaneous purposes.

2.1.15 Calking Compound: Compound for the sealing of conduit risers shall be of a putty like consistency workable with the hands at temperatures as low as 35 degrees F, shall not slump at a temperature of 300 degrees F, and shall not harden materially when exposed to air. The compound shall readily calk or adhere to clean surfaces of the materials with which it is designed to be used. The compound shall have no injurious effects upon the hands of workmen or upon the materials.

### PART 3 - EXECUTION

3.1 INSTALLATION: Provide overhead pole line installation conforming to the requirements of ANSI C2 for Grade B construction of overhead lines in medium loading districts and NEC for mandatory unless an exception therefrom in writing is granted by the Contracting Officer. All streets, alleys, roads, and drives shall be considered "public". Pole configurations shall be as indicated and as shown on the following sketches.

NUMBER	TITLE
TS-16302L-1-1	Symbol Legend General Notes
TS-16302L-1-3	Method of Showing Symbols
TS-16302L-1-3a	Explanation of Notes Symbols
TS-16302L-1-4	Basic Vertical Spacing Requirements
TS-16302L-1-5	Pole Line Material List
TS-16302L-2	X-FB, X-AB
TS-16302L-5	DX-DE-FB, DX-DE-AB
TS-16302L-12	FR3-N, FR3
TS-16302L-16	FDE3-N, FDE2, FQE2-N, FDE3
TS-16302L-31	TTT
TS-16302L-35	GUY
TS-16302L-37	Conduit Riser
TS-16302L-43	Ground

3.1.1 Pole Setting: Pole holes shall be at least as large at the top as at the bottom and shall be large enough to provide 4 inches clearance between the pole and the side of the hole.

3.1.1.1 Pole setting depths shall be 6.0 feet.

3.1.1.2 "Setting of Soil" depths shall apply where pole holes are in soil, sand, or gravel or any combination of these. At corners, dead ends and other points of extra strain, poles 40 feet or more long shall be set 6 inches deeper.

3.1.1.3 On sloping ground, always measure the depth of the hole from the low side of the hole.

3.1.1.4 Thoroughly tamp pole backfill for the full depth of the hole and mound the excess fill around the pole.

3.1.1.5 Set poles so that alternate crossarm gains face in the opposite directions, except at terminals and dead ends where the gains of the last two poles shall be on the side facing the terminal or dead end. On unusually long spans, set the poles so that the crossarm comes on the side of the pole away from the long span. Where pole top pins are used, they shall be on the opposite side of the pole from the gain, with the flat side against the pole.

3.1.1.6 Set poles in alignment and plumb except at corners, terminals, angles, junctions, or other points of strain, where they shall be set and raked against the strain, not less than 2 inches for each 10 feet of pole length above grade, nor more than 4 inches for each 10 feet of pole length after conductors are installed at the required tension. When the average ground run is level, consecutive poles shall not vary more than 5 feet in height. When 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 and the shortened end of the pole given an application of hot preservative. Holes shall be dug large enough to permit the proper use of tampers to the full depth of the hole.

3.1.1.7 Provide plastic pole caps with 1/4-inch sealing rings and four nailing tabs. Fill sealing area with elastigum to the level of the sealing ring, place on pole top and nail each tab down with a 1-1/4 inch aluminum nail. No nails or holes shall be permitted on top of pole.

3.1.1.8 Storage and Handling of Poles: Poles held in storage for more than 2 weeks shall be stored in accordance with ANSI 05.1. The handling of poles shall be in accordance with ANSI 05.1, except that pointed tools capable of producing indentations more than one inch in depth shall not be used.

3.1.2 Anchors and Guys: Install guys as indicated on corner poles at points of change in line direction, at ends of lines, and on adjacent brace poles at railroad and main highway crossings. Place anchors in line with strain and as nearly as possible a distance from the pole equal to the vertical distance from the pole ground line to the point of guy attachment on the pole.

3.1.2.1 Set anchors in place with the anchor rod aligned with, and pointing directly at, the guy attachment on the pole with the anchor rod projecting 60 to 9 inches out of the ground to prevent burial of the rod eye.

3.1.2.2 Complete the anchor and guy installation, dead end to dead end, and tighten the guy before wire stringing and sagging is begun on that line section. Provide strain insulators at a point on the guy strand 8 feet (minimum) from the ground and 6 feet (minimum) from the surface of the pole. Effectively ground and bond guys to the system neutral.

3.1.3 Hardware: Install hardware with washer against the wood and with nuts and lock nuts applied wrench tight.

3.1.4 Grounding: Provide grounding for pole lines conforming to ANSI C2 except that each separate ground electrode shall have a resistance to the solid earth not exceeding 10 ohms. When work in addition to that indicated or specified, is directed in order to obtain the specified ground resistance the provisions of the contract covering "changes" shall apply.

3.1.4.1 Make ground rod connections on pole lines by thermit weld for all ground wire or wire to rod connections.

3.1.4.2 Make thermit welds strictly in accordance with the manufacturer's written recommendations. Welds which have puffed up or which show convex surfaces indicating improper cleaning, are not acceptable. No mechanical connectors are required at thermit weldments.

3.1.4.3 Ground noncurrent carrying metal parts of equipment or enclosures, grounding terminal of each arrester, cable messengers, and operating mechanism of pole-top switches, sectionalizers and reclosers.

3.1.4.4 Separate surge arrester grounds from other grounds.

3.1.4.5 The secondary neutral and the tank of each transformer shall be interconnected and connected to ground.

3.1.4.6 Protect grounding conductors which are run on the surface of wood poles by wood molding extending from the ground line throughout communication and transformer spaces within 8 feet of finished grade.

3.1.5 Conductors: Conductors shall be handled with all care necessary to prevent nicking, kinking, gouging, flattening, or otherwise deforming or weakening the conductor or impairing its conductivity. Remove all damaged sections of conductor and splice the conductor.

3.1.5.1 Conductor splices, as installed, shall exceed the ultimate rated strength of the conductor and shall be of the type recommended by the conductor manufacturer. No splice shall be permitted within 10 feet of any support.

3.1.5.2 Ties on pin insulators shall be tight against the conductor and insulator and ends shall be turned down flat against the conductor so that no wire ends project.

3.1.5.3 Existing conductors to be reinstalled or resagged shall be strung to "FINAL" sag table values for the particular conductor type and size involved.

3.1.5.4 String new conductors to "INITIAL" sag table values recommended by the manufacturer type and size of conductor and ruling span indicated. Conductor sags shall adhere as closely as possible to the values given in the chart but may be adjusted where required by proximity of other existing circuits to provide ample clearance between conductors. Changes in the values of sag shall be subject to the approval of the Contracting Officer.

3.1.5.5 Dead end fittings, clamp or compression type shall conform to the written recommendations of the conductor manufacturer and shall develop the full ultimate strength of the conductor.

3.1.5.6 Make aluminum connections to any other material using only splices, connectors, lugs, or fittings designed for that specific purpose. Submit the manufacturer's directions for applying these fittings for reference and one additional copy maintain at the job site for the use of the inspector.

3.1.6 Risers: Secure conduits on poles as indicated on Sketch TS-16302L-35. Ground metallic conduits.

3.1.7 Transformer Installations: Provide one primary fuse cutout and one surge arrester for each ungrounded phase conductor. The transformer's kVA rating shall be conspicuously displayed on its tank.

3.2 FIELD TESTS: As an exception to requirements that may be stated elsewhere in the contract, the Contracting Officer shall be given 5 working days notice prior to each tests.

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3.2.1 Ground Rod Tests: Do not connect the ground rods until they have been tested for ground resistance value. Make ground resistance measurements in normally dry weather, not less than 48 hours after rainfall. Ground resistance shall also be measured from each piece of equipment to the ground electrode. Use a portable ground testing megger to test each ground or group of grounds. The instrument shall be equipped with a meter reading directly in ohms or fractions thereof to indicate the ground value of the electrode under test. Follow the directions provided by the equipment manufacturer for proper use of the equipment. Provide one copy of the directions for the use of the observing inspectors.

3.2.2 Test Transformer: Test transformer secondary voltages and adjust the voltage at the transformer to provide a secondary voltage of 120/208.

END OF SECTION.

SYMBOL LEGEND

A	-----	ANGLE
AB	-----	ANGLE BRACE
D	-----	DOUBLE
DE	-----	DEADEND
F	-----	FLAT (HORIZONTAL)
FB	-----	FLAT BRACE
LP	-----	LINE POST
N	-----	NEUTRAL
R	-----	RIDGE OR POLE TOP PIN
S	-----	SECONDARY, OPEN WIRE
St	-----	SECONDARY, TRIPLEX
SQ	-----	SECONDARY, QUADRUPLIX
T	-----	TRANSFORMER
TERM	-----	TERMINAL
UG	-----	UNDERGROUND
V	-----	VERTICAL
X	-----	CROSSARM, 8'
X10	-----	CROSSARM, 10'

GENERAL NOTES:

1. Symbols comprising the overhead sketches are not intended to be "all inclusive" for use on every distribution pole line configuration. Only sketches which reflect typical arrangements are included. For other desired arrangements, sketches should be modified or separate details drawn to reflect the specific conditions.
2. Each sketch contains material items which comprise a part of each individual symbol referenced by that sketch. These items are indicated by circled numerals which are identified by Sketches TS-16302L-1.5 and TS-16302L-1.5a.
3. Spacing requirements related to individual components of a symbol are indicated on the appropriate sketch. Vertical spacing requirements between circuits and/or systems are indicated on Sketch TS-16302L-1.4. All other separations between circuits, equipment, etc., shall conform to the National Electrical Safety Code- ANSI C2.

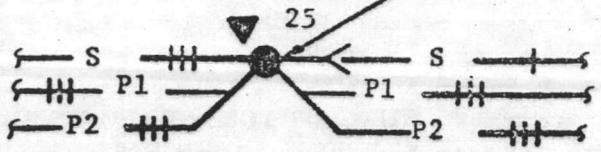
Symbol Legend &amp; General Notes

SKETCH TS-16302L- 1.1

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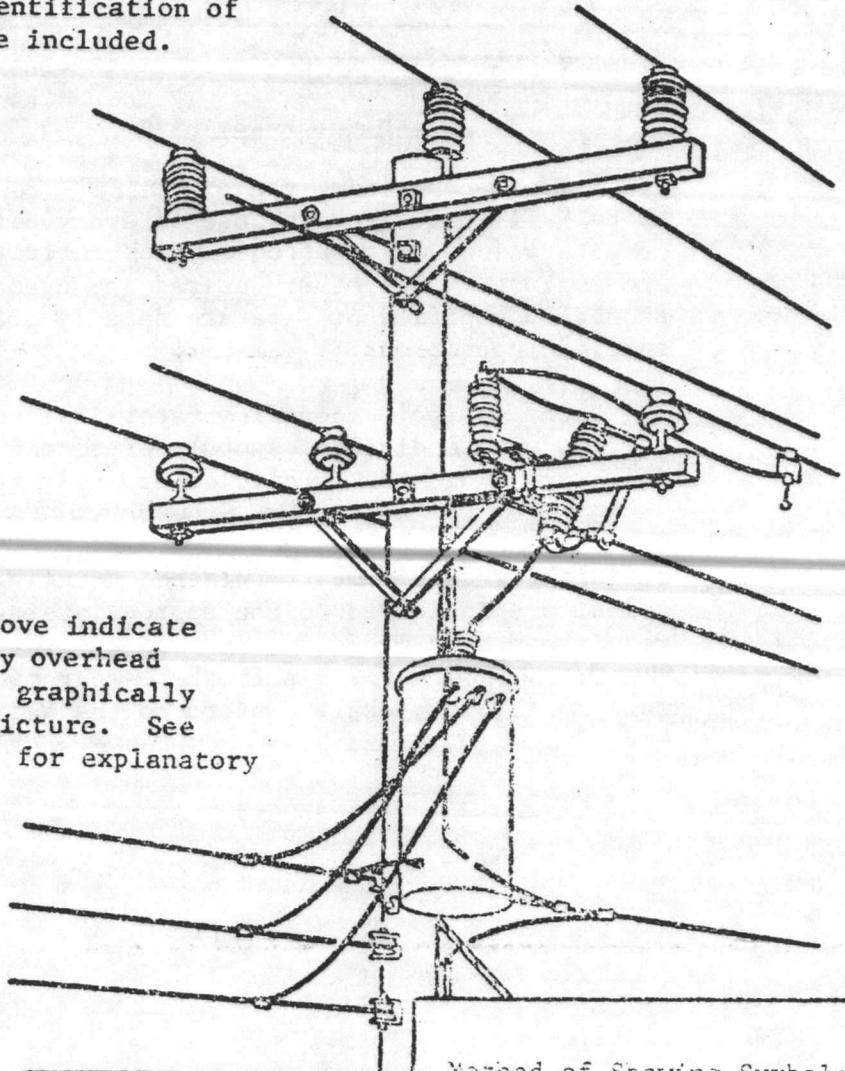
16302-II

Pole # (45'-3)  
X-FB, 35FR3  
X-FP, 15F3  
TF (25KVA, 7.6KV - 120/240V)  
S1, SDE2  
GUY (5/16")  
ANCHOR (10" Screw)  
GROUND



**DESIGN NOTE:**

Method of showing information on plan view is optional and shall be coordinated with legend on individual design basis. However, characteristics & identification of all circuits shall be included.



**NOTE:**

The symbols listed above indicate material (described by overhead sketches) which is graphically illustrated by this picture. See Sketch TS-16302L-1.3a for explanatory notes.

Method of Showing Symbols

SKETCH TS-16302L- 1.3

EXPLANATORY NOTES - METHOD OF SHOWING SYMBOLS

1. Symbols are shown in the basic order as they appear on the pole, by starting at the top and working down.
2. Numerals preceding the symbol indicate the minimum required voltage rating of the assembly, if applicable.
3. Numeral following the symbol indicates the number of conductor associated with the assembly, if applicable.
4. Numeral in parenthesis following the symbol denotes the number of assemblies required, if more than one.
5. Data in parenthesis following the symbol provides information relative to the symbol.

EXPLANATION OF SYMBOLS LISTED FOR POLE ON SKETCH TS-16302L-1.3

Provide 45 foot long, class 3 pole containing:

- X-FB- 8' crossarm with flat brace  
 35FR3 - 35KV insulators, flat (mounted horizontal on crossarm),  
 ridge pin (center phase on pole top pin), three  
 conductors
- X-FB- 8' crossarm with flat brace  
 15F3 - 15KV insulators, flat (mounted horizontal on cross-  
 arm), three conductors. Note: this symbol calls for  
 three crossarm mounted pins in lieu of ridge pin on  
 center phase.
- TF - transformer on flat (horizontal) construction. Data  
 in parenthesis describes the transformer characteris-  
 tics.
- S1 - secondary, one conductor, tangent construction
- SDE2 - secondary deadend, two conductors, open wire
- GUY (5/16") - down guy - wire size 5/16"
- ANCHOR (10" SCREW) - 10" screw type anchor. Note: No plate  
 is included for the anchor symbol
- GROUND - no explanation necessary

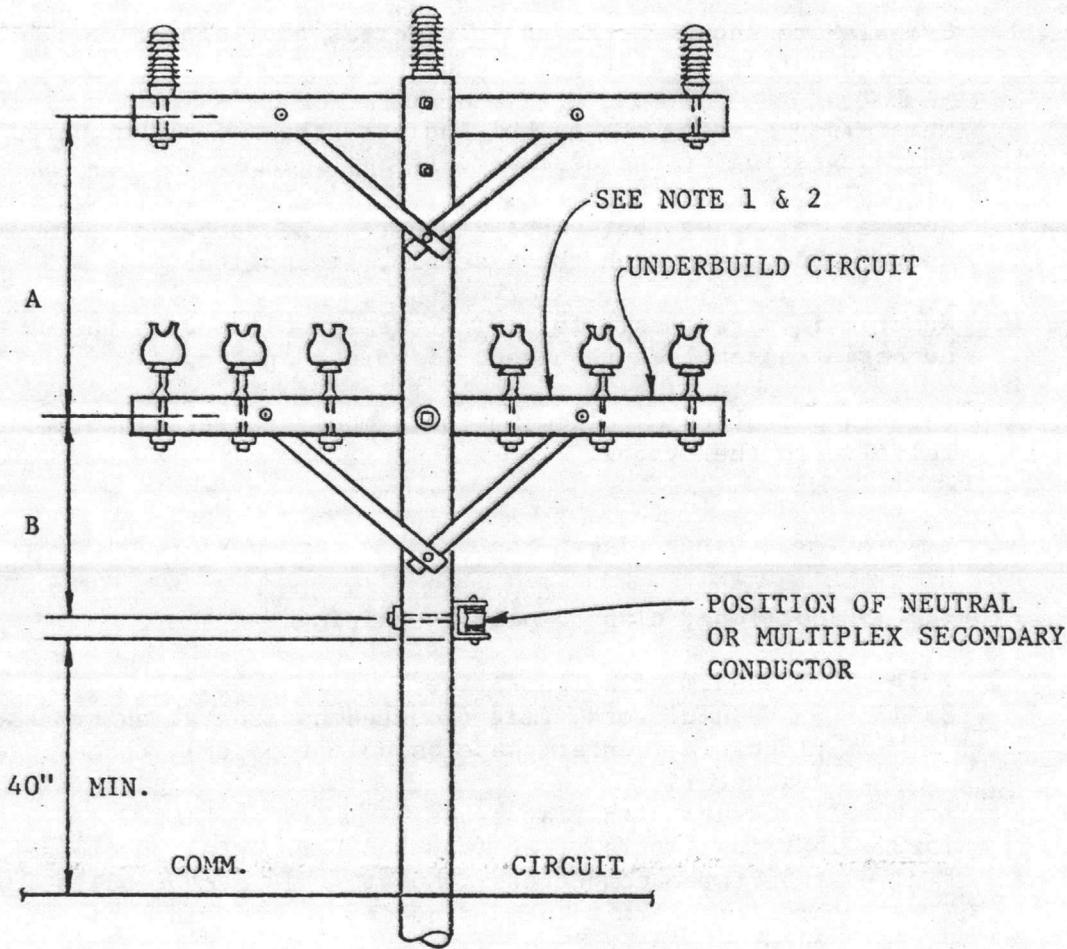
SKETCH TS-16302L-1.3a

Explanation of Notes Symbols

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**NOTES:**

1. For new construction or operating voltages greater than 5KV, limit the number of conductors on crossarm to a maximum of three.
2. Use 10' crossarms for all underbuild circuits with operating voltages greater than 15KV.
3. For horizontal spacing requirements for conductors on same support, refer to the National Electrical Safety Code, ANSI C 2.

$\emptyset - \emptyset$ VOLTAGE	0 - 15KV	15 - 50KV
SPACING A	40"	48" *
SPACING B	40"	40"

\* Provide 60" clearance when operating voltage of underbuild circuit is greater than 15KV

SKETCH TS-16302L-1.4

Basic Vertical Spacing Requirements

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- 1 Flat steel brace (two pieces)
- 2 Machine bolt, 3/8" x length needed with washer, nut and lockwasher
- 3 8' wood crossarm
- 4 Machine bolt, 5/8" x length needed with washer, nut and lockwasher
- 5 Timber connector
- 6 Lagscrew, 1/2" x 4"
- 7 Angle steel brace (two pieces)
- 8 Machine bolt, 1/2" x length needed, with washer, nut & lockwasher
- 9 Deadend box
- 10 Steel pin
- 11 Pin insulator
- 12 Grid gain, used only when there is no pole gain
- 13 Angle steel brace (one piece)
- 14 10' wood crossarm
- 15 5/8" eye nut
- 16 5/8" eye bolt, length as needed, with washer, nut & lockwasher
- 17 Extension link
- 18 Bell type suspension insulator with connecting hardware
- 19 Strain clamp
- 20 Steel angle pin
- 21 Cluster mounting bracket, steel
- 22 Transformer grounding connection
- 23 Stirrup
- 24 Secondary lead support bracket
- 25 Adapter plate for cluster mounting
- 26 Clevis bracket for spool insulator
- 27 Spool insulator
- 28 U bolt clamp
- 29 Preformed guy grip
- 30 Guy hook
- 31 Guy strain insulator
- 32 Guy wire, size as specified
- 33 #4 WP Cu. soft drawn ground wire
- 34 Ground clamp
- 35 Conduit coupling
- 36 Conduit bend
- 37 Insulated bushing
- 38 Perforated strapping, 1 1/2" wide
- 39 Hot line clamp
- 40 Fused cutout, as specified
- 41 Surge arrester, as specified
- 42 Pole top pin
- 43 Crossarm angle pin
- 44 Angle pole top pin
- 45 Wire, #4 WP Cu., (unless otherwise specified) soft drawn
- 46 Tri-mount bracket
- 47 Terminator, porcelain housed
- 48 Mounting bracket
- 49 Cable grip hanger
- 50 Hose clamp

SKETCH TS-16302L-1.5

Pole Line Material List

POLE LINE MATERIAL LIST

- 51—Stud, 3/4" x 1 3/4"
- 52—Line post insulator
- 53—Triple insulator bracket
- 54—Angle clamp
- 55—Insulator, line post clamp
- 56—4' crossarm
- 57—Crossarm gain bracket
- 58—Pulley bracket
- 59—Wedge clamp
- 60—Midspan service clamp
- 61—Stud, 7"
- 62—Saddle, angle
- 63—Saddle, crossarm
- 64—Fitting, pole top
- 65—Connector
- 66—Suspension clamp
- 67—Tie, service cable
- 68—54" Fiberglass strain insulator

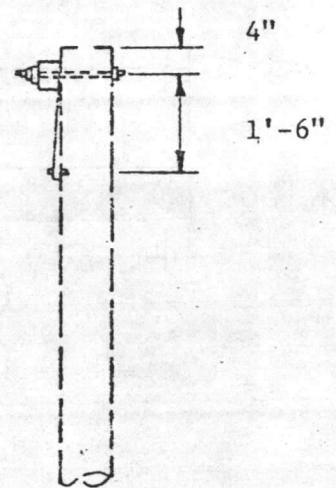
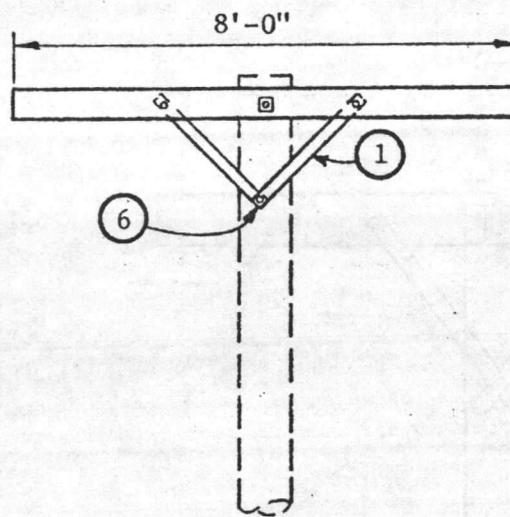
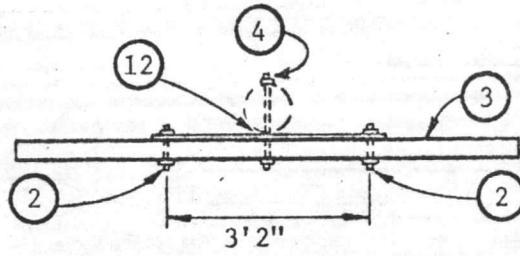
Pole Line Material List

SKETCH TS-16302L-1.5a

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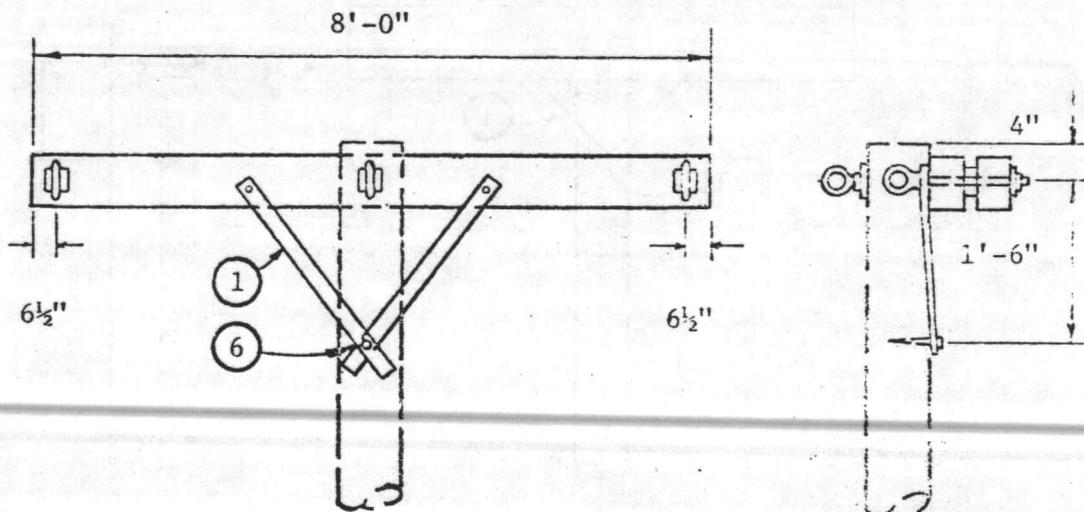
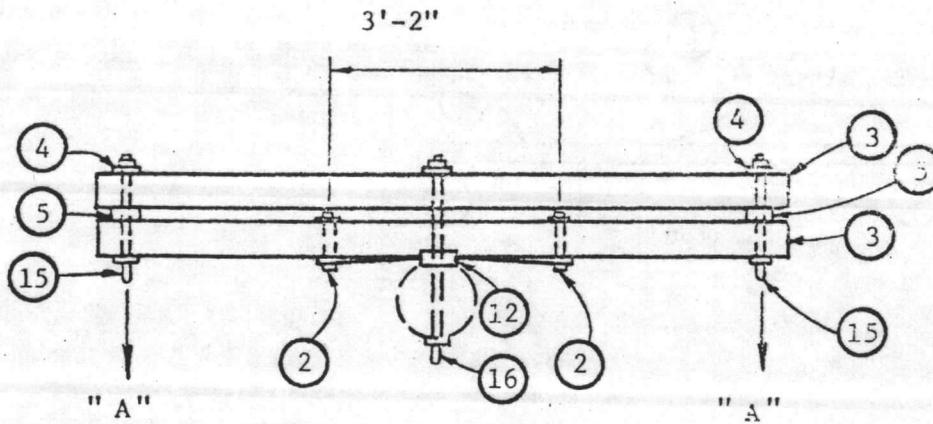
NOTE: DRAWING INDICATES X-FB. SUBSTITUTE (7) FOR (1) AND (8) FOR (6) ON X-AB.

SKETCH TS-16302L- 2

X-FB, X-AB

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MAXIMUM ALLOWABLE CONDUCTOR TENSION AT "A" - 2400#

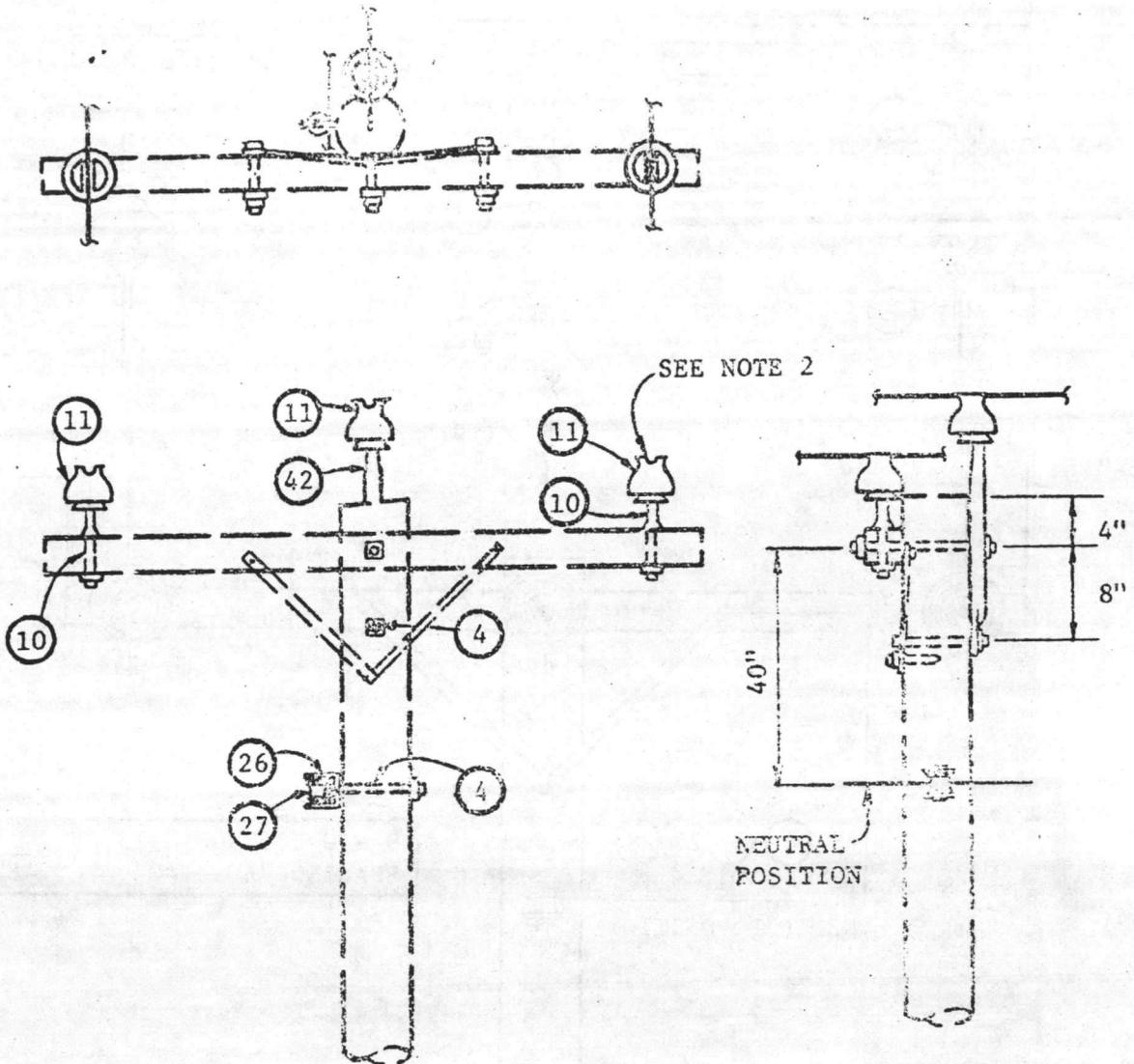
NOTE: DRAWING INDICATES DX-DE-FB. SUBSTITUTE 7 FOR 1, 8 FOR 2 AND 8 FOR 6 ON DX-DE-AB.

SKETCH TS-16302L-5

DX-DE-FB, DX-DE-AB

05-8-0399

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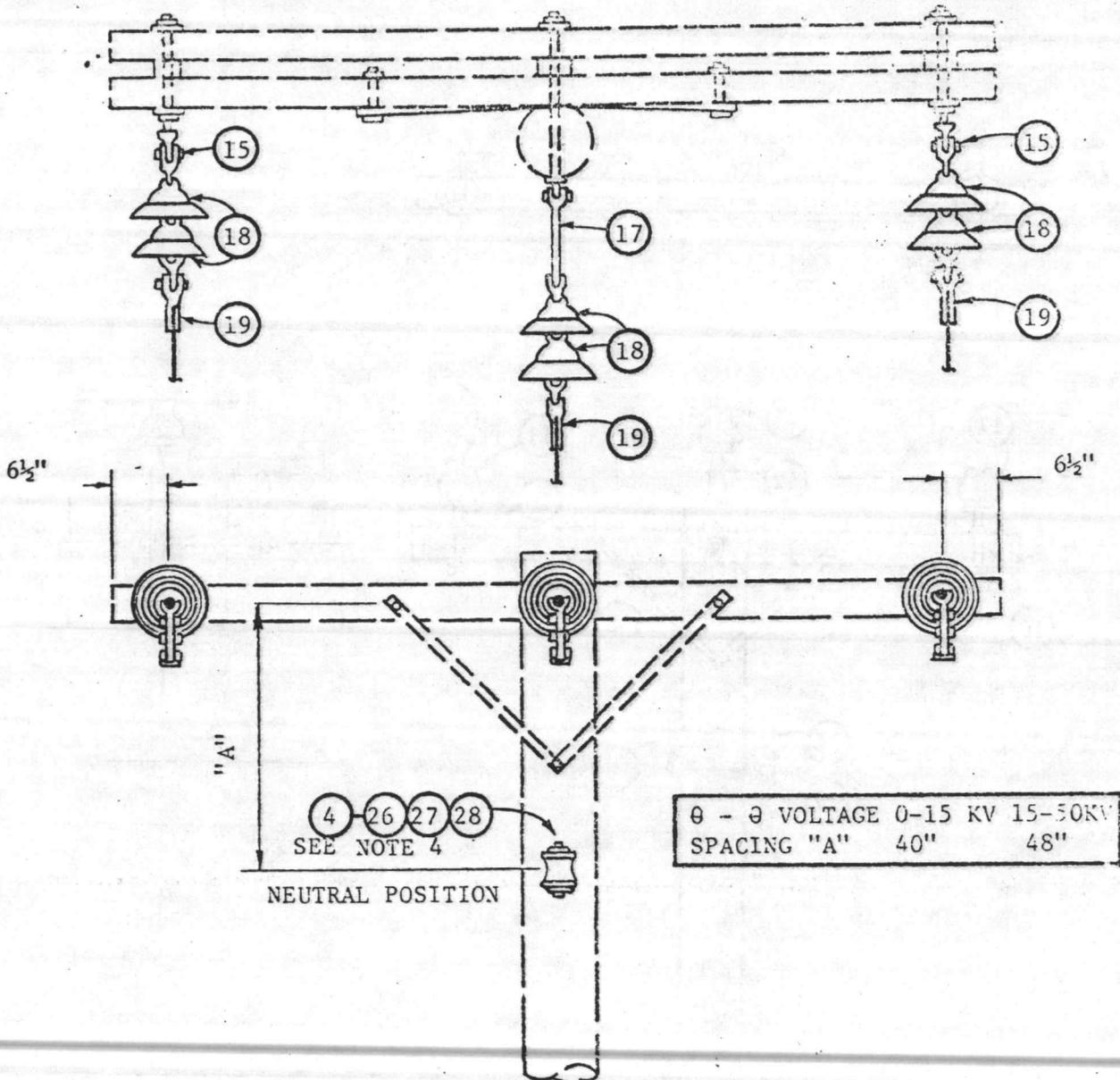


**NOTES:**

1. DRAWING REPRESENTS FR3-N. ELIMINATE (4), (26), AND (27) FOR NEUTRAL POSITION ON FR3.
2. ON CIRCUIT VOLTAGE OPERATING LEVELS GREATER THAN 15 KV, SUBSTITUTE (52) FOR (11), (64) FOR (42) AND (51) FOR (10).
3. REFER TO SPECIFICATIONS FOR REQUIRED CLASS OF INSULATORS.

FR3-N. FR3 (0-50KV)

SKETCH TS-16302L-12



**NOTES:**

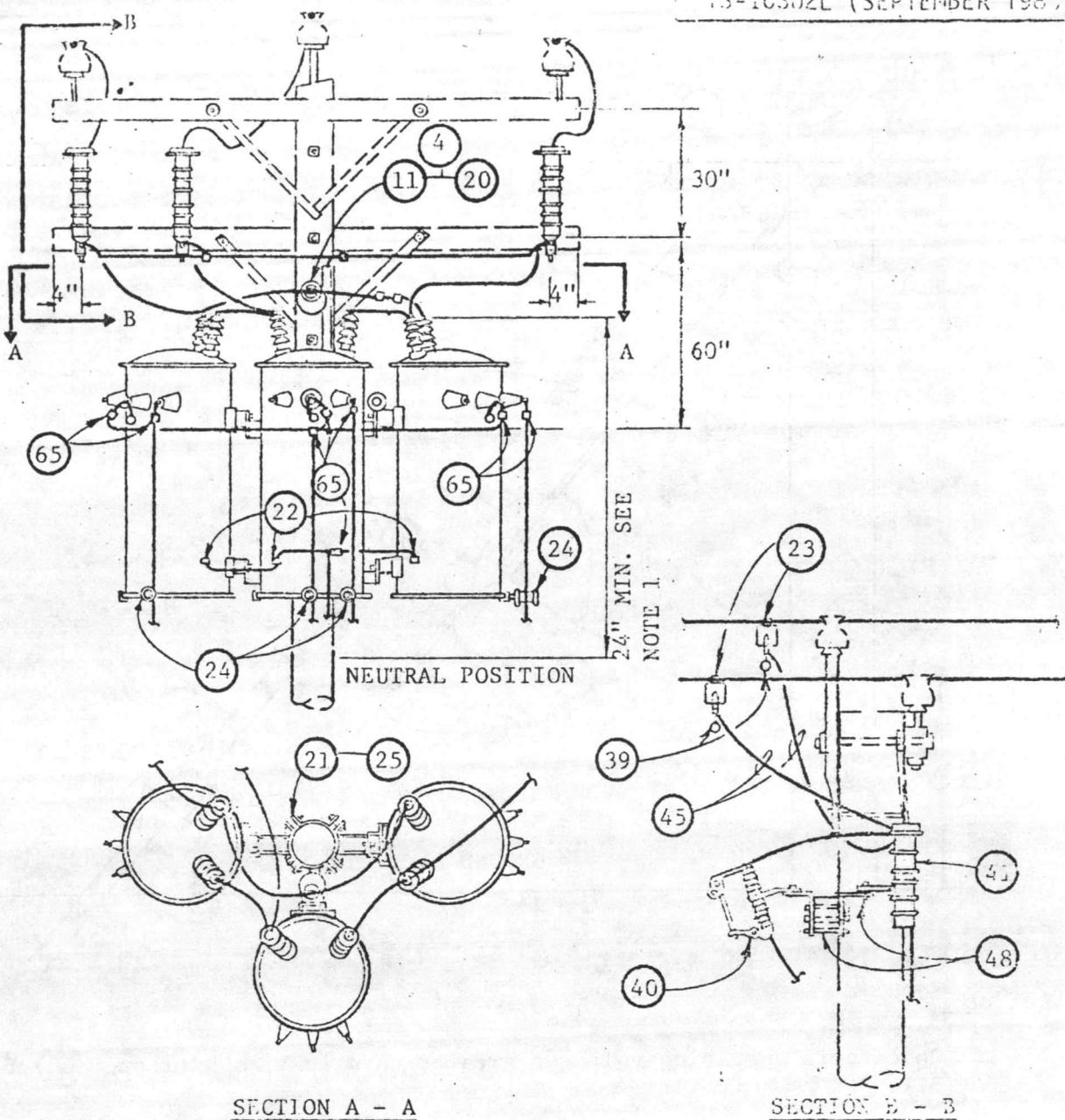
1. DRAWING REPRESENTS FDE3-N. ELIMINATE INSULATOR ASSEMBLY FOR MIDDLE PHASE ON FDE2 AND FDE2-N.
2. DRAWING REPRESENTS DEADEND ASSEMBLY FOR 5-15 KV CLASS. REFER TO SPECIFICATIONS FOR NUMBER AND CLASS OF INSULATORS REQUIRED FOR EACH VOLTAGE LEVEL.
3. OMIT ITEMS (4), (26), (27) AND (28) FOR NEUTRAL ON FDE2 AND FDE3.
4. FOR NEUTRAL CONDUCTOR LARGER THAN #2 A.W.G., SUBSTITUTE (19) FOR (26), (27) AND (28).

SKETCH TS-16302L-16

FDE3-N, FDE2, FDE2-N, FDE3  
(0-50KV)

05-80-0399

16302-20

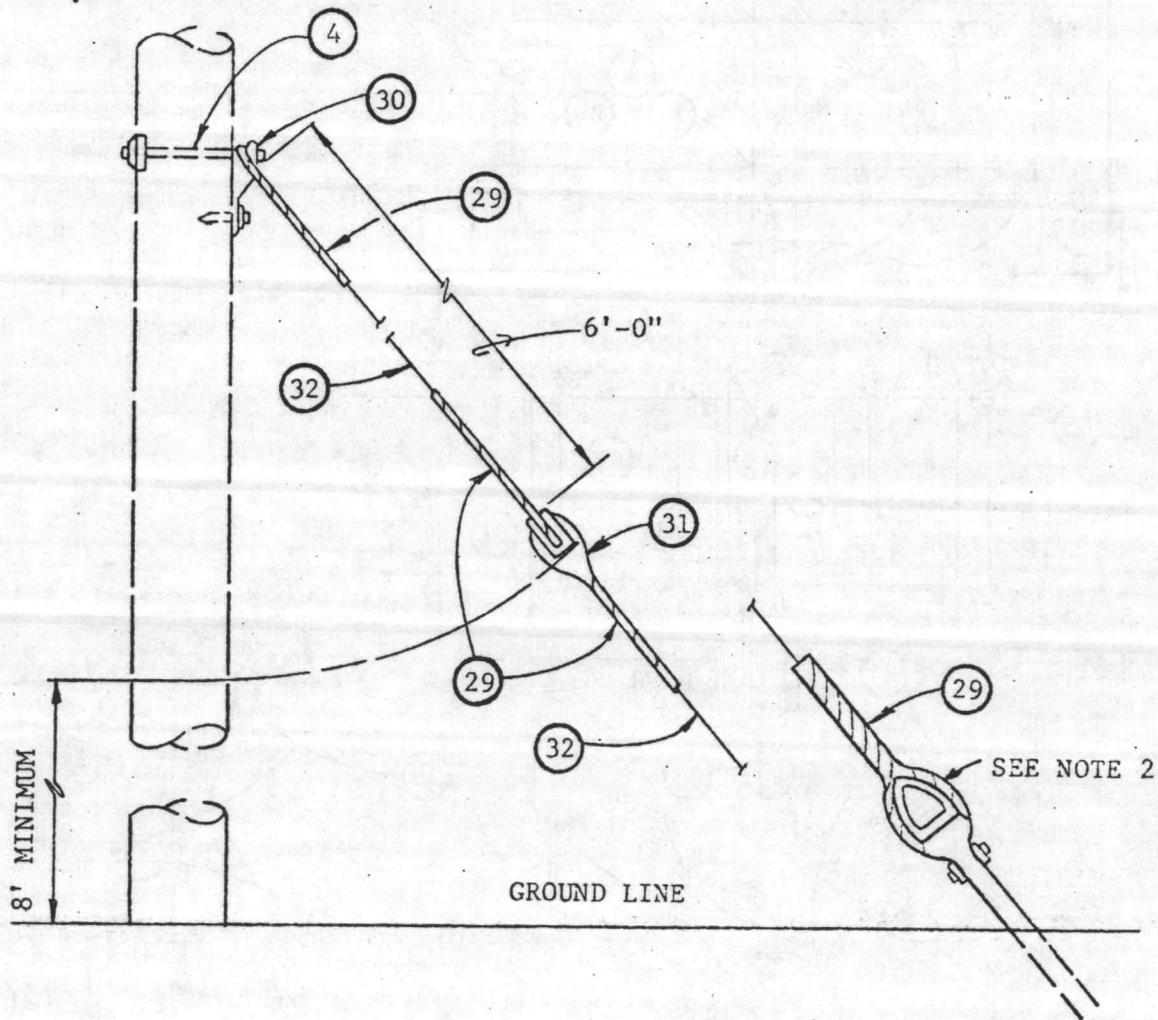


NOTES:

1. This dimension shall be measured on pocket bushing type transformer from lowest energized point on lead or bushing.
2. When transformer secondary leads connect to open wire or quadroplex secondary, conductor shall have 600 volt insulation rating and minimum ampacity of 125% of transformer full load secondary current.
3. When transformer provides underground service, size secondary or service conductors as indicated.
4. Modify connections as required to accommodate transformers with primary bushing arrangements other than shown.

SKETCH TS-16302L- 31

TTT



NOTES:

1. On circuit operating voltages greater than 15KV, substitute 68 for 31.
2. Coordinate installation with anchor as specified.

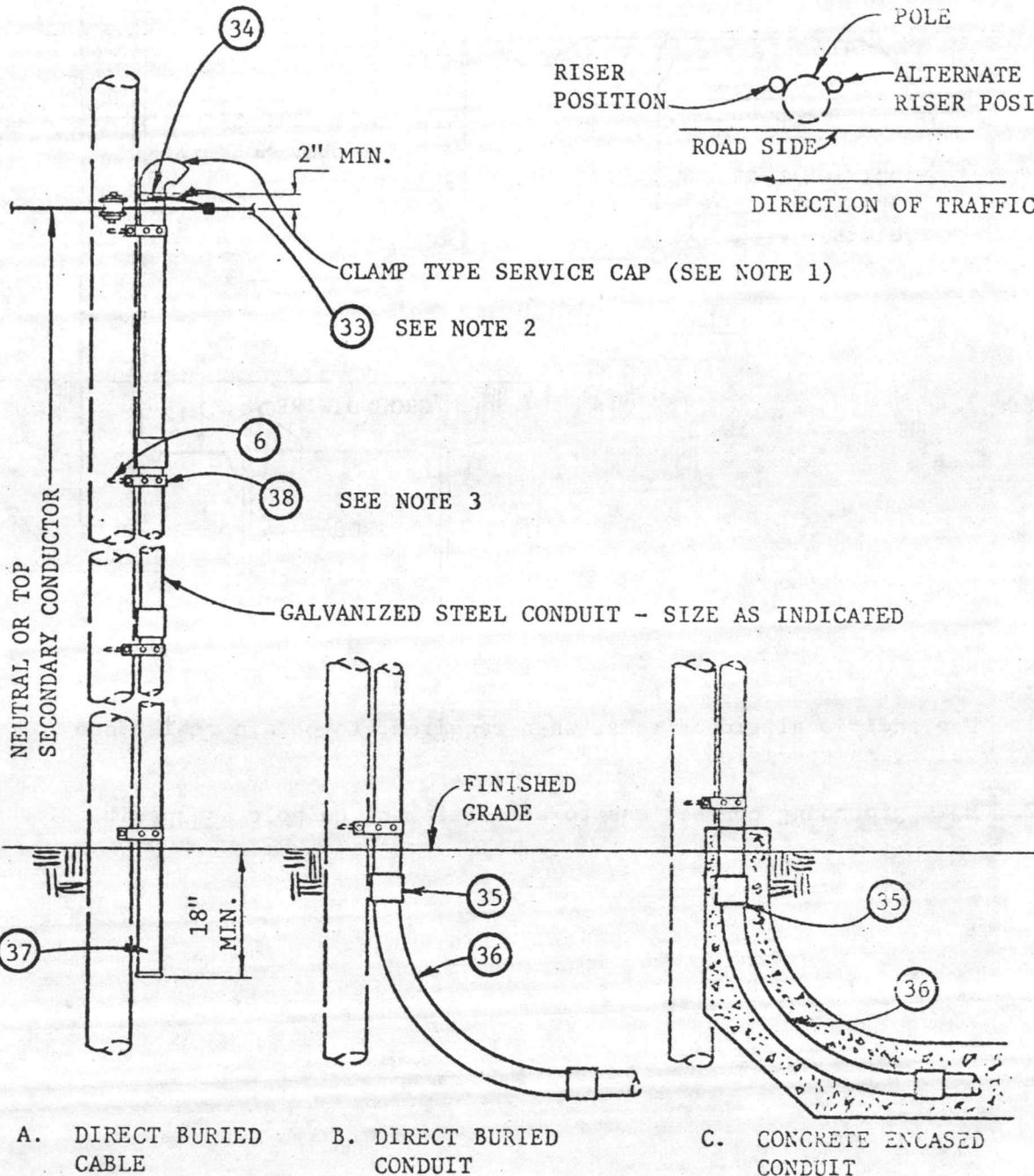
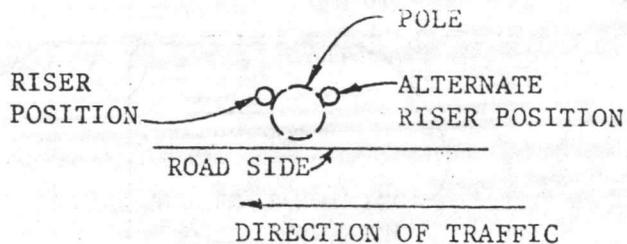
SKETCH TS-16302L- 35

GUY

05-80-0399

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CONDUIT LOCATION

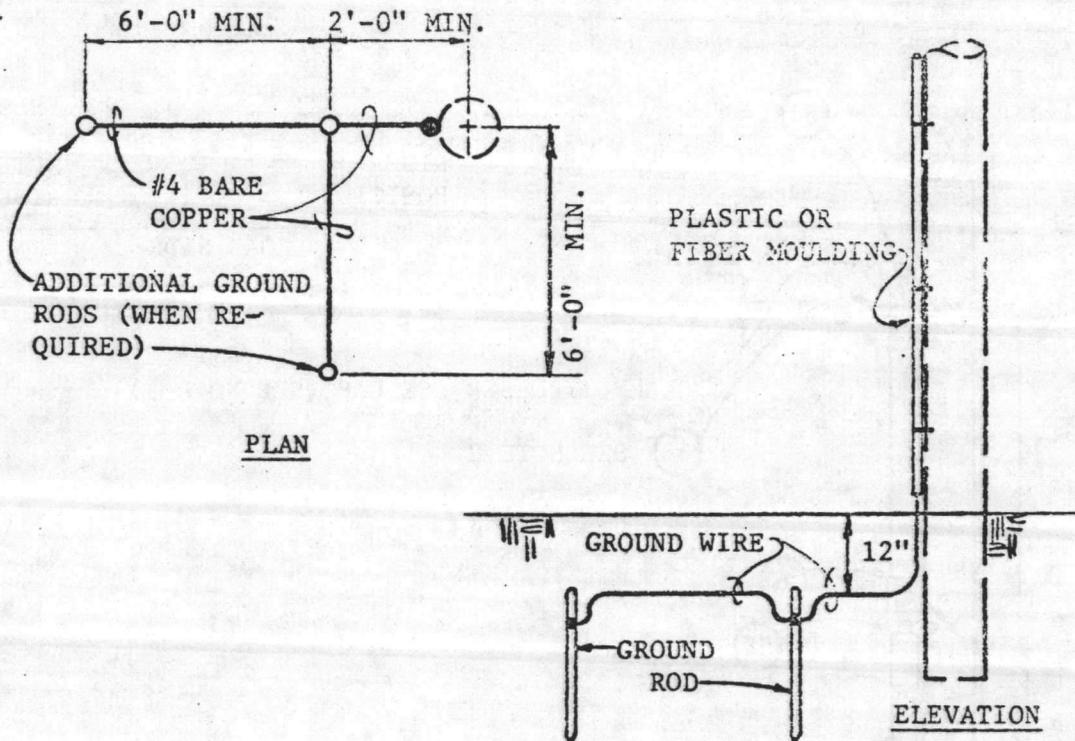


NOTES:

1. On conduit riser for primary circuits, eliminate service cap and provide grounding type insulating bushing.
2. Connect to grounded neutral or provide ground per specifications.
3. Space straps at maximum of 4' intervals.

SKETCH TS-16302L-37

CONDUIT RISER  
(SIZE AS INDICATED)



NOTES:

1. Use additional ground rods, when required, to obtain resistance value, as specified.
2. Make grounding connections to all equipment on pole as specified.

SKETCH TS-16302L-43

GROUND

## SECTION 16402

### INTERIOR WIRING SYSTEMS

#### 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 the basic designation only.

##### 1.1.1 Federal Specifications (Fed. Spec.):

W-C-375B	Circuit Breaker, Molded Case, Branch-Circuit and Service
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##### 1.1.2 American National Standards Institute (ANSI) Publications:

C80.1-1977	Specification for Rigid Steel Conduit, Zinc-coated
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C80.3-1977	Specification for Electrical Metallic Tubing, Zinc-coated
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C80.5-1977	Specification for Rigid Aluminum Conduit
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##### 1.1.3 National Electrical Manufacturers Association (NEMA) Publications:

1CS1-1978 (REV. 3-80)	General Standards for Industrial Control and Systems
--------------------------	--

1CS2-1978 (REV. 2-80)	Industrial Control Devices, Controllers and Assemblies
--------------------------	--

1CS4-1977 (REV. 1-78)	Terminal Blocks for Industrial Control Equipment and Systems
--------------------------	--

1CS6-1978 (REV. 1-80)	Enclosures for Industrial Controls and Systems
--------------------------	--

MG1-1978 (REV. 2-80)	Motors and Generators
-------------------------	-----------------------

TC6-1978	PVC and ABS Plastic Utilities Duct for Underground Installation
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TC9-1978 (REV. 1-78)	Fittings for ABS or PVC Plastic Utilities Duct for Underground Installation
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WD1-1979 (REV. 1-79)	General Purpose Wiring Devices
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##### 1.1.4 National Fire Protection Association (NFPA) Publications:

70-1981	National Electrical Code (NEC) 05-80-0399
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1.1.5 Underwriters' Laboratories, Inc. (UL) Publications:

1-1979 (MAR 80)	Flexible Metal Conduit
UL 20-1979 (JUL 81)	General Use Snap Switches
50-1980	Cabinets and Boxes
67-1979	Panelboards
467-1972 (MAY 79)	Grounding and Bonding Equipment
486A-1978	Wire Connectors and Soldering Lugs for Use with Copper Conductors
510-1976	Insulating Tape
514-1979 (Apr 80)	Outlet Boxes and Fittings
854-1979	Service-Entrance Cables
869-1977 (May 80)	Service Equipment
943-1972 (Jan 77)	Ground-Fault Circuit Interrupters
1242-1977 (Draft)	Intermediate Metal Conduit

1.2 GENERAL REQUIREMENTS: Section 16011, "Electrical General Requirements," applies to this section with additions and modifications specified herein. In each of the standards referred to herein, consider the advisory provisions to be mandatory, as though the word "shall" had been substituted for "should" wherever it appears. Interpret reference in these standards to the "authority having jurisdiction", or words of similar meaning, to mean the Contracting Officer.

1.2.1 Underground Service: Underground service into buildings shall terminate at a point 5 feet outside the building and projections thereof, except that service conductors shall be continuous to the interior terminating point indicated. The underground portion of the conduit shall be encased in a concrete envelope having a wall thickness of not less than three inches and shall be buried not less than 24 inches. Where a conduit enters through a concrete floor, the curved portion shall not be visible above the finished floor and the entire conduit below the floor slab shall be encased in a concrete envelope having a wall thickness of not less than three inches. Ends of the underground conduit shall be protected by threaded metal caps until connections are made. Underground service

from 5 feet outside the building to the connection to the existing power system shall be provided under Section 16301, "Underground Electrical Work."

1.2.2 Electrical Characteristics: Electrical characteristics for this project shall be 12.47 kV primary, three phase, three wire, 60 hertz, delta connected and 120/208 volts secondary, three phase, four wire, wye connected.

1.3 SUBMITTALS:

1.3.1 Manufacturer's Data: Submit for the following:

- a. Receptacles
- b. Motor Controllers
- c. Circuit Breakers
- d. Switches
- e. Intermediate Metal Conduit
- f. Panelboards
- g. Plastic Conduit

1.3.2 Shop Drawings: Submit for the following:

- a. Panelboards

1.3.3 Certificates of Conformance or Compliance: Submit for the following:

- a. Conduit (except plastic and IMC)
- b. Ground Rods
- c. Outlet and Junction Boxes
- d. Insulating Tapes
- e. Conduit Fittings
- f. Device Plates
- g. Conductors
- h. Toggle Switches
- i. Fittings for cable and conduit
- j. Tapes
- k. Cover Plates

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT: All materials, equipment, and devices shall, as a minimum, meet the requirements of UL where UL Standards are established for those items and the requirements of NFPA-70. All items shall be new unless specified or indicated otherwise.

2.1.1 Coordination: Coordinate new equipment (fuses, circuit breakers, relays, and other equipment) with existing station equipment. The Contracting Officer will provide the necessary information on existing equipment when requested.

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2.1.2 Conduit and Fittings:

2.1.2.1 Rigid Steel Conduit (Zinc-coated): ANSI C80.1

2.1.2.2 Intermediate Metal Conduit (IMC): UL 1242, zinc-coated steel only.

2.1.2.3 Flexible Metal Conduit: UL 1, zinc-coated steel only.

2.1.2.4 Fittings for Metal Conduit, Electrical Metallic Tubing, and Flexible Metal Conduit: UL 514. All ferrous fittings shall be cadmium or zinc-coated per UL 514.

2.1.2.4.1 Fittings for rigid metal conduit and IMC shall be threaded type. Split couplings are not acceptable.

2.1.3 Outlet Boxes and Covers: UL 514, cadmium or zinc-coated if of ferrous metal.

2.1.4 Cabinets, Junction Boxes, and Pull Boxes (with volume greater than 100 cubic inches): UL 50, hot-dip zinc-coated if of sheet steel.

2.1.5 Wires and Cables: Wire and cables shall meet the applicable requirements of NFPA 70 and UL for the type of insulation, jacket, and conductor specified or indicated. Unless indicated or specified otherwise, conductor sizes are based on copper. Conductors No. 10 AWG and smaller shall be solid copper. Conductors No. 8 AWG and larger shall be stranded copper. Wires and cables manufactured more than twelve months prior to date of delivery to the site shall not be used.

2.1.5.1 Color coding is required for all service, feeder, branch, control, and signalling circuit conductors. Color shall be white for neutrals and green for grounding conductors. The color of the ungrounded conductors in different voltage systems shall be as follows:

a. 120/208 volt, 3-phase: Phase 'A' - Black, Phase 'B' - Red, Phase 'C' - Blue.

All ungrounded conductors of the same color shall be connected to the same ungrounded feeder conductor.

2.1.5.2 Conductor sizes are expressed in American Wire Gage (AWG) or in circular mils. Minimum size for branch circuits shall be No. 12 AWG; for Class 1 remote-control and signal-circuits - No. 14 AWG; for Class 2 low-energy remote control and signal-circuits - No. 16 AWG.

2.1.5.3 Power and Lighting Conductors: UL 83, type THW or THWN and rated 600 volts.

2.1.5.4 Service Entrance and Underground Secondary Conductors: UL 854, type USE, single conductor, rated 600 volts. Cable shall be suitable for direct burial in earth or for installation in conduit.

2.1.5.5 Grounding and Bonding Conductors: Grounding and bonding conductors shall be insulated type where indicated or specified.

2.1.5.6 Flexible Connections: Connections to movable equipment shall be flexible metal conduit of the type indicated on contract drawings, with the number of conductors indicated.

2.1.6 Splices and Termination Components: UL 486A and UL 510 for insulating tapes. Connectors for wires No. 10 and smaller shall be insulated pressure-type or wirenut-type. Provide solderless terminal lugs on stranded conductors.

2.1.7 Device Plates: Provide one-piece device plates for outlets and fittings to suit the devices installed. Plates on unfinished walls and on fittings shall of zinc-coated sheet steel or cast metal having round or beveled edges. Screws shall be machine or type with countersunk heads in a color to match plate. 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.

#### 2.1.8 Receptacles:

2.1.8.1 Receptacles: NEMA WD 1, heavy duty, grounding type. Ratings and configurations shall be as indicated. Bodies shall be of brown, ivory thermosetting plastic supported on a metal mounting strap. Wiring terminals shall be of the screw type, side wired. Connect grounded pole to the mounting strap.

2.1.8.2 Duplex Receptacles: 20 amperes, 125 volts, No. 5342.

2.1.8.2 Ground Fault Circuit Interrupter Receptacles: UL 943, as applicable, and shall be duplex feed through-type for mounting in a standard outlet box. The device shall be capable of detecting a current leak of 5 milliamperes.

2.1.9 Panelboards: UL 67 and UL 50, as applicable. Panelboards for use as service disconnecting means shall additionally conform to UL 869. Panelboards shall be circuit breaker equipped. Design complete panelboard assembly so that any individual loosening or removing supplemental insulation supplied as a means of obtaining clearance as required by UL. Where "space only" is indicated, make provisions for the future installation of a breaker sized as indicated.

2.1.9.1 Panelboard Buses: Provide copper bus or aluminum bars supported on bases independent of the circuit breakers. Design main busses and back pans so that breakers may be changed without machining, drilling, or tapping. Provide an insulated neutral bus in each panel for connection of a circuit neutral conductors. Provide a separate ground bus marked with a green stripe along its front and bonded to the steel cabinet for connecting grounding conductors.

2.1.9.2 Circuit Breakers: Fed. Spec. W-C-375 ambient-compensated thermal magnetic type with interrupting capacity of 10,000

amperes symmetrical minimum. Design breakers to accept copper, copper-clad and aluminum conductors. Plug-in circuit breakers are not acceptable.

2.1.9.2.1 Multipole Breakers: Provide common-type with a single operating handle. Design breakers so that an overload in one pole automatically causes all poles to open. Maintain phase sequence throughout each panel so that any three adjacent breaker poles are connected to Phases A, B, and C respectively.

2.1.10 Motors: NEMA MG1. The approximate size of each motor is indicated. Determine specific motor characteristics to insure provision of correctly sized starters and overload heaters. Motors for operation on 208-volt, 3-phase circuits shall have a voltage rating of 200 volts. Motors shall be designed to operate at full capacity with a voltage variation of plus or minus 10 percent of the motor voltage rating. Motors shall be of sufficient size for the duty to be performed and shall not exceed their full load nameplate current rating when driven equipment is operated at specified capacity under the most severe conditions likely to be encountered.

2.1.11 Motor Controllers: NEMA ICS2. All controllers shall have thermal overload protection in each phase and short circuit protection. Magnetic type motor controllers shall have under voltage protection when used with momentary-contact push-button stations or switches and shall have under voltage release when used with maintained-contact pushbutton stations or switches. When used with a pressure, float, or similar automatic-type or maintained-contact switch, the controller shall have a hand-off-automatic selector switch. Connections to the selector switch shall be such that only the normal automatic regulatory control devices will be by-passed when the switch is in the "hand" position. All safety control devices such as motor overload protective devices shall be connected in the motor control circuit in both the "hand" and the "automatic" positions. Control circuit connections to any hand-off-automatic selector switch or to more than one automatic regulatory control device shall be made in accordance with an indicated wiring diagram. The selector switch shall have means for locking in any position. For each motor not in sight of the controller, the controller disconnecting means shall be capable of being locked in the open position or a manually operated, non-fused switch which will disconnect the motor the source of supply shall be placed within sight of the motor location. Overload protective devices shall give adequate protection to the motor windings, be of the thermal inverse-time-limit type, and include a manual-reset type push button on the outside of the motor controller case. The cover of a combination motor controller and manual switch or circuit breaker shall be interlocked with the operating handle of the switch or circuit breaker so that the cover cannot be opened unless the handle of the switch or circuit breaker is in the off position.

2.1.11.1 Enclosures for Starters and Controllers: NEMA 12 per NEMA ICS6, unless indicated otherwise.

2.1.11.2 Pushbutton Stations: Provide with "start-stop" momentary contacts having one normally open and one normally closed set of

contacts, and ruby indicating lights to indicate when the motor is running. Stations shall be heavy-duty oil-tight designed for surface mounting.

2.1.11.3 Pilot and Indicating Lights: Provide transformer, resistor, or diode type.

2.1.12 Grounding and Bonding Equipment: UL 467

2.1.12.1 Equipment Grounds: Provide a green-colored equipment grounding conductor which shall be separate from the electrical system neutral conductor. Provide equipment ground conductors in branch circuits serving convenience outlets, receptacles, portable and permanently installed electrical appliances, equipment, apparatus, and other miscellaneous metal-enclosing bodies (including light switch boxes) normally within contact of personnel.

2.1.13. Toggle Switches: UL 20, totally enclosed with bodies of thermosetting plastic and a mounting strap. Handles shall be brown. Wiring terminals shall be of the screw type, side wired. Switches shall be rated quite-type AC only, 15 ampere, 120-277 volts, single poles.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION:

3.1.1 General Requirements: Electrical installations shall conform to the requirements of NFPA 70 and to the requirements specified herein. Measure mounting heights specified or indicated to the center of the device or outlet.

3.1.2 Wiring Methods: Wiring method shall be insulated conductors installed in conduit, except where specifically indicated or specified otherwise, or required by NFPA 70 to be installed otherwise. Conduit shall be rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT) except where specified or indicated otherwise.

3.1.2.1 Underground Conduit: Rigid steel or steel IMC and encased in a minimum of 3 inches of concrete.

3.1.2.2 Service Entrance Conduit: Rigid steel or IMC from the service equipment to a point at least 5 feet beyond the building or projection thereof and not less than 24-inches below grade.

3.1.3 Conduit Installation: Unless indicated otherwise, conduit shall be exposed on walls and ceilings. Keep conduit at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install conduit that will be visible after completion of project parallel with or at right angles to ceilings, walls, and structural members.

3.1.3.1 Support Conduit by pipe straps, wall brackets, hangers, or ceiling trapeze. Fasten by wood screws to wood; by toggle bolts on hollow masonry units; by concrete inserts or expansion bolts on concrete

or brick; by machine screws, welded threaded studs, or spring-tension clamps on steel work. 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 or wood screws. Threaded C-clamps may be used on rigid steel conduit only. Do not weld conduits or pipe straps to steel structures. The load applied to fasteners shall not exceed one-fourth of the proof test load. Fasteners attached to concrete ceiling shall be vibration and shock resistant. Holes cut to a depth of more than 1-1/2 inches in reinforced concrete beams or to a depth of more than 3/4-inch in concrete joints shall not cut the main reinforcing bars. Fill holes that are not used. In partitions of light steel construction, use sheet-metal screws. In suspended-ceiling construction, run conduit above the ceiling and fasten only lighting system branch circuit conduits to the ceiling supports. Spring steel fasteners may be used for lighting branch circuit conduit supports in suspended ceiling in dry locations.

3.1.3.2 Make changes in direction of runs with symmetrical bends or cast-metal fittings. Make field-made bends and offsets with a hickey or conduit-bending machine. Do not install crushed or deformed conduits. Avoid trapped conduits. Prevent plaster, dirt, or trash from lodging in conduits, boxes, fittings, and equipment during construction. Free clogged conduits of all obstructions.

3.1.3.3 Fasten conduits to sheet metal boxes and cabinets with two locknuts where required by NFPA 70, where insulated bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, use at least a single locknut and bushing. Locknuts shall be the type with sharp edges for digging into the wall of metal enclosures. Install bushings on the ends of conduits and provide insulating type where required by NFPA 70.

3.1.3.4 Flexible connections of short length shall be provided for equipment subject to vibration, noise transmission, or movement and for all motors. Liquid-tight flexible conduit shall be used in wet locations. A separate ground conductor shall be provided across all flexible connections.

3.1.4 Boxes, Outlets, and Supports: Provide boxes in the wiring or raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures. Boxes for metallic raceways shall be of the cast-metal hub type when located in normally wet locations, when surface mounted on outside of exterior surfaces, in hazardous areas, and when installed exposed up to 7 feet above interior floors and walkways. Boxes in other locations shall be sheet steel except that aluminum boxes may be used with aluminum conduit. Each box shall have the volume required by the NEC for the number of conductors enclosed in the box. Boxes for mounting lighting fixtures shall be not less than 4 inches square (or octagonal). Fasten boxes and supports with wood screws on wood, with bolts and expansion shields on concrete or brick, with toggle bolts on hollow masonry units, and with machine screws or welded studs on steel work. Threaded studs drive in by powder charge and provided with lockwashers and nuts may be used in lieu of wood screws, expansion shields, or machine screws. In open overhead spaces, cast boxes threaded to raceways need not be separately

supported except where used for fixture support; support cast metal boxes having threadless connectors and sheet metal boxes directly from the building structure or by bar hangers. Where bar hangers are used, attach the bar to raceways on opposite sides of the box and support the raceway with an approved type fastener not more than 24 inches from the box. When penetrating reinforced-concrete members, avoid cutting any reinforcing steel.

3.1.4.1 Boxes for use with raceway system shall not be less than 1-1/2 inches deep except where shallower boxes required by structural conditions are approved. Boxes for other than lighting-fixture outlets shall be not less than 4 inches square except that 4 by 2 inch boxes may be used where only one raceway enters the outlet. Telephone outlet shall be a minimum of 4 inches square by 1-1/2 inches deep.

3.1.4.2 Pull Boxes: Construct of not less than the minimum size required by the NEC of code-gage aluminum or galvanized sheet steel except where cast-metal boxes are required in locations specified above. Furnish boxes with screw-fastened covers. Where several feeders pass through a common pull box, tag the feeders to indicate clearly the electrical characteristics, circuit number, and panel designation.

3.1.5 Mounting Heights: Mount panelboards so the height of the top operating handle will not exceed 78 inches from the floor. Mount lighting switches 3 feet, 10 inches above finished floor. Mount receptacles and other devices 36 inches above finished floor.

3.1.6 Conductor Identification: Provide conductor identification within each enclosure where a tap, splice, or termination is made. Make identification with color-coded insulated conductors, plastic-coated self-sticking printed markers, colored nylon cable ties and plates, or heat-shrink type sleeves. Identify control circuit terminations.

3.1.7 Splices: Make splices in accessible locations. Make splices in conductors No. 10 AWG and smaller with an insulated pressure type connector. Make splices in conductors No. 8 AWG and larger with a solderless connector and cover with an insulation material equivalent to the conductor insulation.

3.1.8 Equipment Grounds: Equipment grounds shall be solid and continuous from a connection at earth to panelboards. Make ground connections at panelboards, outlets, equipment, and apparatus in an approved and permanent manner.

3.1.8.1 Resistance: The maximum resistance to ground of a driven ground rod shall not exceed 25 ohms under normally dry conditions. Where the resistance obtained with one ground rod exceeds 25 ohms, provide additional ground rods not less than 6 feet on centers.

3.1.9 Equipment Connections: Provide power wiring for the connection of motors and control equipment under this section of the specification. Except as otherwise specifically noted or specified, automatic control wiring, control devices, and protective devices within the control circuitry are not included in this section of the specifications, but shall be provided under Section(s): by others later.

### 3.2 FIELD TESTS AND INSPECTION:

3.2.1 General: Show by demonstration in service that all circuits and devices are in operating condition. Tests shall be such that each item of control equipment will function not less than five times.

3.2.2 Test on 600-Volt Wiring: Test all 600-Volt wiring to verify that no short circuits or accidental grounds exist. Tests shall be made using an instrument which applies a voltage of approximately 500 volts to provide a direct reading of resistance.

3.2.3 Grounding System Test: Test the grounding system to assure continuity and that the resistance to ground is not excessive. Test each ground rod for resistance to ground. Make resistance measurements in normally dry weather, not less than 48 hours after rainfall, and with the ground rod under test isolated from other grounds. Submit written results of each test to the Contracting Officer and indicate the location of the rod as well as the resistance and soil conditions at the time the measurements were made.

3.2.4 Tests and Inspections: Perform field tests and inspections in accordance with Division 1, except that the Government will provide electric power required for the tests at no charge when available.

END OF SECTION.

SECTION 16510  
LIGHTING, INTERIOR

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 the basic designation only.

1.1 American National Standards Institute (ANSI) Standards:

C82.1-1972                      Fluorescent Lamp Ballasts, Specifications  
for, including Supplement C82.1a-1973

1.2 National Fire Protection Association (NFPA) Publications:

70-1981                          National Electrical Code (NEC)

1.3 Underwriters Laboratories, Inc. (UL) Standards:

57-1972                          Fixtures, Electrical Lighting  
(R OCT 77)

935-1971                         Ballasts, Fluorescent - Lamp  
(R NOV 77)

1.4 Lighting Fixtures Plates Dated 1981:

Nos. NF GS 16510-6

2. SUBMITTALS:

2.1 Shop Drawings: Submit shop drawings and data for lighting fixtures. Drawings shall show types, size, accessories, installation details, and other details of construction.

3. GENERAL REQUIREMENTS: General requirements include those specified in Section 16011, "General Requirements, Electrical", and as specified herein. Materials not considered to be lighting equipment or lighting fixture accessories are specified in Section 16402, "Interior Wiring Systems." These materials include branch circuit wiring and conduit, outlet boxes and fittings, and tapes, splices, and connectors. Lighting fixtures and accessories mounted on the exterior surfaces of buildings are included in this section of the specification.

4. LIGHTING FIXTURES AND ACCESSORIES:

4.1 General: UL 57. Lighting fixtures shall be as indicated and as described on Lighting Sketch. Nos. NFGS 16510-6. Lighting fixtures shall be provided complete with lamps of the number, type and wattages shown. The details, shapes and dimensions are indicative of the general type desired, but are not intended to restrict selection to fixtures of any particular manufacturer. Fixtures of similar designs and equipment, light-distribution and brightness characteristics, and of equal finish and quality will be acceptable as approved.

05-80-0399

4.1.1 Suspended Fixtures: Provide with swivel hangers to insure a plumb installation. Hangers shall be cadmium plated steel with swivel-ball tapped for the conduit size indicated. Hangers shall be able to support twice the combined weight of the fixtures to which they are attached. Hangers shall allow fixtures to swing within an angle of 20 degrees. Single unit suspended fluorescent fixtures shall have twin stem hangers. Rods shall be a minimum 3/16 inch diameter.

4.1.2 Fluorescent Fixtures: Provide each open-tube fluorescent fixture with spring-loaded telescoping sockets or lamp retainers two per lamp.

4.2 Ballasts for Fluorescent Fixtures: UL 935, ANSI C82.1, and shall be labeled Certified Ballast Manufacturers (CBM) certified by Electrical Testing Laboratories (ETL). Ballasts shall be high power factor type unless indicated otherwise and shall be designed to operate on the voltage system to which they are connected. Ballasts shall be class P and shall have sound rating "A" unless otherwise noted. Fixtures and ballasts shall be designated and constructed to limit the ballast case temperature to 90 degrees Celcius (C) when installed in an ambient temperature of 100 degrees Fahrenheit (F).

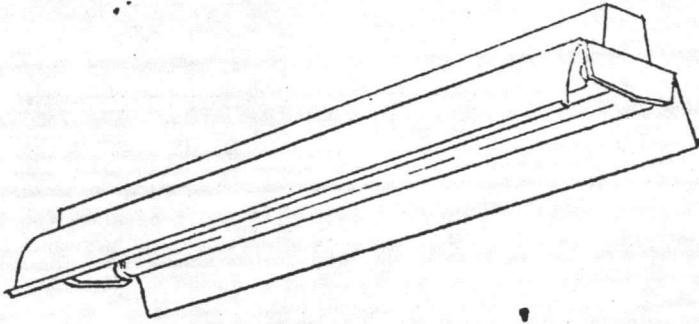
5. INSTALLATION: Lighting fixtures shall be set plumb, square, level, and in alignment and shall be secured in accordance with manufacturers' directions and approved shop drawings. The installation shall meet with the requirements of NFPA 70. Mounting heights specified or indicated shall be to bottom of fixture. The exact mounting of lighting fixtures shall be approved on the job before installation is commenced and, where applicable, after coordinating with the type, style, and pattern of the ceiling being installed.

#### 6. FIELD TESTS AND INSPECTIONS:

6.1 General: The Contractor shall show by demonstration in service that all circuits, fixtures and equipment are in good operating condition. Tests shall be such that each piece of control equipment will function not less than five times. The Contractor shall give the Contracting Officer 5 days advance notice of the dates and times for tests and inspections.

6.2 Tests: Interior installations shall be tested for insulation resistance after all wiring is completed and connected ready for the attachment of fixtures and equipment, and again when fixtures and equipment are connected ready for use. Test shall be as specified in Section 16402, "Interior Wiring Systems." All defective material and workmanship disclosed as the result of the tests given herein shall be corrected at no cost to the Government. The Contractor shall show by demonstration in service that all circuits and devices are in good operating condition.

END OF SECTION.



LUMINAIRE REQUIREMENTS

1. HOUSING SHALL BE 22 GAGE (U.S. STANDARD) DIE FORMED COLD ROLLED STEEL, CHEMICALLY TREATED FOR RUST PREVENTION & FINISHED WITH WHITE BAKED ENAMEL.
2. HOUSING WELDED OR SECURED BY SCREWS OR RIVETS INTO A SINGLE ASSEMBLY.
3. SOLID RELECTOR 22 GAGE (U.S. STANDARD) UNLESS NOTED OTHERWISE.
4. THE LUMINAIRE SHALL NOT PERMANENTLY DISTORT WHEN LIFTED BY ONE CORNER.
5. SPACING TO MOUNTING HEIGHT RATIO = 1.5
6. LUMINAIRE SHALL BE CAPABLE OF CONTINUOUS ROW AND SINGLE UNIT MOUNTING.
7. SPRING LOADED PLUNGER TYPE SOCKETS.
8. BALLAST SHALL BE HIGH POWER FACTOR ( $\geq 0.9$ ) ETL, CBM APPROVED RAPID START OR SLIMLINE CLASS P ENERGY SAVING BALLAST WITH A SOUND RATING OF B.
9. MINIMUM COEFFICIENT OF UTILIZATION (CU) WITH THE FOLLOWING CAVITY REFLECTANCE:

CEILING = 80%                      WALL = 50%                      FLOOR = 20%

<u>ROOM CAVITY RATIO</u>	<u>CU</u>
1	0.92
2	0.81
3	0.71
4	0.63

INDUSTRIAL FLUORESCENT

TYPE A - 48" 2 LAMP  
 TYPE B - 96" 2 LAMP

SKETCH NFGS16510-6

STYLE  
**NL-6**



DECISION #NC81-1148 - MOD. #1  
 (45 FR 86200 - December 30,  
 1980)  
 Statewide, North Carolina  
 Water, Sewer, & Heavy  
 Construction

ADD:  
 ELECTRICIANS

Basic Hourly Rates	Fringe Benefits Payments			
	H & W	Pensions	Vacation	Education and/or Appr. Tr.
\$6.50				

