

S P E C I F I C A T I O N S

for

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Phoenix, AZ 85009

**NEW RIVER EROSION CONTROL
AND ESTHETIC TREATMENT**

Maricopa County, Arizona

Authority:

Public Law 89-298
Flood Control Act of 1965

Appropriation:

96x3122, Construction, General
96x8862, Contributed Funds, Required
Corps of Engineers, Civil



**US Army Corps
of Engineers**

Los Angeles District

A37 1.506

SOLICITATION, OFFER, AND AWARD <i>(Construction, Alteration, or Repair)</i>	1. SOLICITATION NO. DACW09-90-B-0003	2. TYPE OF SOLICITATION <input checked="" type="checkbox"/> SEALED BID (IFB) <input type="checkbox"/> NEGOTIATED (RFP)	3. DATE ISSUED 1 Dec 89	PAGE OF PAGES 1 of 3
	IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.			

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO.	6. PROJECT NO.
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7. ISSUED BY U.S. ARMY ENGINEER DISTRICT, LOS ANGELES P.O. Box 2711 Los Angeles, California 90053-2325	CODE	8. ADDRESS OFFER TO U.S. ARMY ENGINEER DISTRICT, LOS ANGELES Arizona Area Office 3636 N. Central Avenue, Room 760 Phoenix, Arizona 85012-1936
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9. FOR INFORMATION CALL: <input type="checkbox"/>	A. NAME See "INSTRUCTIONS TO BIDDERS"	B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS)
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SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".
10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS (Title, Identifying no., date):

NEW RIVER EROSION CONTROL AND ESTHETIC TREATMENT, Maricopa County, Arizona

Work consists of installation of landscape, irrigation system and appurtenant work.

The estimated cost of construction is between \$250,000 and \$500,000.

11. The Contractor shall begin performance within ** calendar days and complete it within ** calendar days after receiving award, notice to proceed. This performance period is mandatory, negotiable. (See ** SPECIAL CLAUSES .)

12A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? <i>(If "YES," indicate within how many calendar days after award in Item 12B.)</i>	12B. CALENDAR DAYS
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	10

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and no copies to perform the work required are due at the place specified in Item 8 by 1:00 PM (hour) local time 3 January 1990 (date). If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee is, is not required.

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

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

14. NAME AND ADDRESS OF OFFEROR (Include ZIP Code)	15. TELEPHONE NO. (Include area code)
	16. REMITTANCE ADDRESS (Include only if different than Item 14)
CODE	FACILITY CODE

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

AMOUNTS ▶ In accordance with the attached BIDDING SCHEDULE.

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

19 ACKNOWLEDGMENT OF AMENDMENTS

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

AMENDMENT NO											
DATE											

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER <i>(Type or print)</i>	20B. SIGNATURE	20C. OFFER DATE
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AWARD (To be completed by Government)

21. ITEMS ACCEPTED:

22. AMOUNT	23. ACCOUNTING AND APPROPRIATION DATA
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24. SUBMIT INVOICES TO ADDRESS SHOWN IN <i>(4 copies unless otherwise specified)</i>	ITEM	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO <input type="checkbox"/> 10 U.S.C. 2304(c)(1) <input type="checkbox"/> 41 U.S.C. 253(c)(1)
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26. ADMINISTERED BY	CODE	27. PAYMENT WILL BE MADE BY
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CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

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

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

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

Continuation of Standard Form 1442

20D. (1) IF THE OFFEROR IS A JOINT VENTURER, COMPLETE THE FOLLOWING:

_____	_____	_____
(Company Name)	(Signature)	(Title)
_____	_____	_____
(Company Name)	(Signature)	(Title)
_____	_____	_____
(Company Name)	(Signature)	(Title)

NOTE: If a Corporation is participating as a member of a Joint Venture, the Certificate as to Corporate Principal in item (3) below must also be completed and signed.

(2) IF THE OFFEROR IS A PARTNERSHIP, LIST FULL NAME OF ALL PARTNERS

_____	_____
(Name)	(Signature)
_____	_____
(Name)	(Signature)
_____	_____
(Name)	(Signature)

(3) IF THE OFFEROR IS A CORPORATION, THE FOLLOWING CERTIFICATE SHOULD BE COMPLETED:

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the _____
 (name)
 Secretary of the corporation named as offeror in the within offer; that
 _____, who signed said offer on behalf of the corporation,
 (name)
 was then _____ of said corporation; that the signature thereto
 (title)
 is genuine; and that said contract was duly signed, sealed and attested for
 and in behalf of said corporation by authority of its governing body.

(Name of Corporation)

(Affix)
(CORPORATE SEAL)

(Secretary)

BIDDING SCHEDULE

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Amount</u>
1.	NEW RIVER EROSION CONTROL AND ESTHETIC TREATMENT	1	Job	L.S.	\$ _____

TOTAL AMOUNT: \$ _____

NOTE: Amounts shall be indicated in either figures or words, not both.

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INSTRUCTIONS TO BIDDERS

1. SOLICITATION DEFINITIONS--SEALED BIDDING (JUL 1987) FAR 52.214-1.

"Offer" means "bid" in sealed bidding.

"Solicitation" means an invitation for bids in sealed bidding.

"Government" means United States Government.

2. AMENDMENTS TO INVITATIONS TO BIDS (NOV 1988) FAR 52.214-3.

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

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

3. FALSE STATEMENT IN BIDS (APR 1984) FAR 52.214-4. Bidders must provide full, accurate, and complete information as required by this solicitation and its attachments. The penalty for making false statements in bids is prescribed in 18 U.S.C 1001.

4. SUBMISSION OF BIDS (APR 1984) FAR 52.214-5.

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

4.2 Telegraphic bids will not be considered unless authorized by the solicitation; however, bids may be modified or withdrawn by written or telegraphic notice, if such notice is received by the time specified for receipt of bids.

5. DIRECTIONS FOR SUBMITTING BIDS.

5.1 Envelopes containing bids, guarantees, etc., must be sealed, marked, and addressed as follows:

Bid Under Reference No:
DACW09-90-B-0003

To: U.S. ARMY ENGINEER DISTRICT,
LOS ANGELES
ATTN: 3636 North Central Avenue,
Room 760
Phoenix, Arizona 85012-1936

5.2 Hand carried bids shall be deposited in Room 760, 3636 North Central Avenue, Phoenix, Arizona 85012-1936, prior to the time and date set for opening of bids or may be delivered to Room 760 immediately prior to bid opening time.

5.3 Telegraphic Modifications to Bids should be addressed to:

U.S. Army Engineer District, Los Angeles
3636 North Central Avenue, Room 760
Phoenix, Arizona 85012-1936

5.4 Modifications to bids submitted by facsimile (telecopier) or teletype are not authorized and will not be considered.

6. EXPLANATION TO PROSPECTIVE BIDDERS (APR 1984) FAR 52.214-6. Any prospective bidder desiring an explanation or interpretation of the solicitation, drawings, specifications, etc., must request it in writing soon enough to allow a reply to reach all prospective bidders before the submission of their bids. Oral explanations or instructions given before the award of a contract will not be binding. Any information given a prospective bidder concerning a solicitation will be furnished promptly to all other prospective bidders as an amendment to the solicitation, if the information is necessary in submitting bids or if the lack of it would be prejudicial to other prospective bidders.

7. LATE SUBMISSIONS, MODIFICATIONS, AND WITHDRAWALS OF BIDS (APR 1984) FAR 52.214-7.

7.1 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 it:

7.1.1 Was sent by registered or certified mail not later than the fifth calendar day before the date specified for 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

7.1.2 Was sent by mail (or was a telegraphic bid 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.

7.2 Any modification or withdrawal of a bid is subject to the same conditions as in paragraph 7.1 above.

7.3 The only acceptable evidence to establish 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 processed as if mailed late. "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 by employees of the U.S. or Canadian Postal Service on the date of mailing. Therefore, bidders should request the postal clerks to place a hand cancellation bull's-eye postmark on both the receipt and the envelope or wrapper.

7.4 The only acceptable evidence to establish the time of receipt at the Government installation is the time/date stamp of that installation on the bid wrapper or other documentary evidence of receipt maintained by the installation.

7.5 Notwithstanding paragraph 7.1 above, a late modification of an otherwise successful bid that makes its terms more favorable to the Government will be considered at any time it is received and may be accepted.

7.6 A bid may be withdrawn in person by a bidder or its authorized representative if, before the exact time set for receipt of bids, the identity of the person requesting withdrawal is established and that person signs a receipt for the bid.

8. PREPARATION OF BIDS-CONSTRUCTION (APR 1984) FAR 52.214-18.

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

8.2 The bid form may require bidders to submit bid prices for one or more items on various bases, including:

- (1) Lump sum bidding;
- (2) Alternate prices;
- (3) Units of construction; or
- (4) Any combination of subparagraphs (1) through (3) above.

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

8.4 Alternate bids will not be considered unless this solicitation authorizes their submission.

9. CONTRACT AWARD-SEALED BIDDING-CONSTRUCTION (FEB 1986) FAR 52.214-19.

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

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

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

10. BID BOND (MAR 1989) DFAR 252.228-7007.

10.1 The Offeror (Bidder) shall furnish a separate bid bond, or United States bonds, Treasury notes or other public debt obligations of the United States, in the proper form and amount, by the time set for opening of bids. Failure to do so may be cause for rejection of the bid. The Contracting Officer will return bid bonds or notes of the United States (1) to unsuccessful bidders as soon as practicable after the opening of bids; and (2) to the successful bidder upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the bid as accepted.

10.2 If the successful bidder, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or give a bond(s) as required by the solicitation within the time specified, the Contracting Officer may terminate the contract for default.

10.3 Unless otherwise specified in the bid, the bidder will (1) allow sixty (60) days for acceptance of its bid; and (2) give bond within ten (10) days after receipt of the forms by the bidder.

10.4 In the event the contract is terminated for default, the Bidder is liable for any cost of acquiring the work that exceeds the amount of its bid. The bid bond, or bonds or notes of the United States, is available to offset the difference.

11. AVAILABILITY OF SPECIFICATIONS LISTED IN THE DOD INDEX OF SPECIFICATIONS AND STANDARDS (DODISS) (APR 1984) FAR 52.210-2. Single copies of specifications cited in this solicitation may be obtained by submitting a written request to the supply point listed below. The request must contain the title of the specification, its number, date, applicable amendment(s), and the solicitation or contract number. In case of urgency, telephone or telegraphic requests are acceptable. Voluntary standards, which are not available to offerors and contractors from Government sources, may be obtained from the organization responsible for their preparation, maintenance, or publication.

Commanding Officer
U.S. Naval Publication and Forms Center
5801 Tabor Avenue
Philadelphia, PA 19120
Telex Number.....834295
Western Union Number....710-670-1685
Telephone Number.....(215) 697-3321

12. AVAILABILITY FOR EXAMINATION OF SPECIFICATIONS, STANDARDS, PLANS, DRAWINGS, DATA ITEM DESCRIPTIONS, AND OTHER PERTINENT DOCUMENTS (JUN 1977) DFARS 252.210-7003. The specification, standards, plans, drawings, descriptions, and other pertinent documents cited in this solicitation may be examined at the following locations:

Brunswig Square Building
Plan Room, Room 300
360 East Second Street
Los Angeles, California 90013

13. EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE, EFARS 52.2/9108(f). Whenever a contract or modification of contract price is negotiated, the Contractor's cost proposals for equipment ownership and operating expenses shall be determined in accordance with the requirements of paragraph: EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE contained in the SPECIAL CLAUSES. A copy of EP 1110-1-8 "Construction Equipment Ownership and Operating Expense Schedule" is available for review at Room 7216, 300 North Los Angeles Street, Los Angeles, California.

14. SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS SUBCONTRACTING. Bidders are cautioned that failure to comply in good faith with the CONTRACT CLAUSES entitled (1) "Utilization of Small Business Concerns and Small Disadvantaged Business Concerns" and (2) "Small Business and Small Disadvantaged Business Subcontracting Plan (Alternate I)", when applicable, will be a material breach of contract. In order to assist prime contractors in developing a source list of Small and Small Disadvantaged Business Concerns, you are encouraged to contact minority Contractor

associations, the Minority Business Development Agency, and the appropriate General Business Service Centers in your Standard Metropolitan Statistical Area, addresses of which may be obtained from:

Write: U.S. Army Engineer District, Los Angeles
ATTN: CESPL-DE-B
P.O. Box 2711
Los Angeles, California 90053-2325

Telephone: Alice Tafoya
Small and Disadvantaged Business Utilization Specialist
Area Code (213) 894-4920

15. ADDITIONAL INFORMATION pertaining to these plans and specifications may be obtained by writing or calling (collect calls not accepted) U.S. Army Engineer District, Los Angeles, Attn: Mr. G. E. Davis, P.O. Box 2711, Los Angeles, California 90053-2325. Telephone (213) 894-5493.

15.1 All inquiries after bid opening should be directed to: Mr. B. J. Meirowsky. Telephone (213) 894-5660. By mail: P.O. Box 2711, Los Angeles, California 90053-1325. In person: Brunswig Square Building, Room 308, 360 East Second Street, Los Angeles, California 90013.

15.2 Bid Results may be obtained by calling (213) 894-3638.

16. SITE INSPECTION. Arrangements for visiting the site may be made by contacting: Mr. Kelly Ryan, telephone (602) 878-4520.

17. DRAWINGS. Specifications with half-size drawings will be furnished upon receipt of payment of \$12.00 per set. Full-size drawings will be furnished upon receipt of payment of \$40.00 per set. If individual plan sheets are requested, they will be furnished at the rate of \$0.70 for full-size for each sheet requested, but with a minimum charge of \$1.00. The maximum charge shall not exceed the charge for a full set of plans. No refund of the payment for drawings will be made and the drawings need not be returned to the District Engineer. Additional copies of the specifications alone will be furnished an applicant at the rate of \$5.00 per copy. Payments will be made by check or money order and mailed to the U.S. Army Engineer District, Los Angeles, P.O. Box 2711, Los Angeles, California 90053-2325. Checks and money orders should be made payable to "FAO, U.S. Army, Los Angeles District". Over the counter purchases of plans and specifications may be made at Brunswig Square Building, Room 300, 360 East Second Street, Los Angeles, California 90013.

18. NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (APR 1984) FAR 52.222-23.

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

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

Goals for minority participation for each trade	Goals for female participation for each trade
25.0% to 30.0%	6.9%

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

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

18.4 The Contractor shall provide written notification to the Director, Office of Federal Contract Compliance Programs, within 10 working days following award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the:

- (1) Name, address, and telephone number of the subcontractor;
 - (i) Employer identification number of the subcontractor;
- (2) Estimated dollar amount of the subcontract;
- (3) Estimated starting and completion dates of the subcontract; and
- (4) Geographical area in which the subcontract is to be performed.

18.5 As used in this Notice, and any contract resulting from this solicitation, the "covered area" is the State of Arizona.

19. BONDS.

19.1 Bid Bonds. Each Bidder shall submit with his bid a Bid Bond (Standard Form 24) with good and sufficient surety or surities acceptable to the Government, or other security as provided in paragraph: BID BOND hereinbefore, in the form of

twenty percent (20%) of the bid price or \$3,000,000, whichever is lesser. The Bid Bond penalty may be expressed in terms of a percentage of the bid price or may be expressed in dollars and cents.

19.2 Performance and Payment Bonds. After the perscribed forms have been presented to the bidder to whom award is made for signature, two bonds, each with good and sufficient surety or sureties acceptable to the Government, shall be furnished; namely a Performance Bond (Standard Form 25) and a Payment Bond (Standard Form 25A). The penal sums of such bonds will be as follows:

19.2.1 Performance Bond. The penal sum shall equal one hundred percent (100%) of the contract price.

19.2.2 Payment Bond.

19.2.2.1 When the contract price is \$1,000,000 or less, the penal sum will be fifty percent (50%) of the contract price.

19.2.2.2 When the contract price is in excess of \$1,000,000 but not more than \$5,000,000, the penal sum shall be forty percent (40%) of the contract price.

19.2.2.3 When the contract price is more than \$5,000,000, the penal sum shall be \$2,500,000.

19.3 Any bonds furnished will be furnished by the Contractor to the Government prior to commencement of Contract performance.

NOTE: For contracts less than \$25,000, Bid Bonds, and Performance and Payment Bonds are not required.

20. ARITHMETIC DISCREPANCIES, EFARS 14.201/90.

20.1 For the purpose of initial evaluation of bids, the following will be utilized in resolving arithmetic discrepancies found on the face of the Bidding Schedule as submitted by bidders:

(a) Obviously misplaced decimal points will be corrected;

(b) In case of discrepancy between unit price and extended price, the unit price will govern;

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

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

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

21. SERVICE OF PROTEST (NOV 1988) FAR 52.233-2.

21.1 Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with General Accounting Office (GAO) or the General Services Administration Board of Contract Appeals (GSCA), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from the Chief, Contracting Division, or his authorized representative, Brunswig Square Building, Room 308, 360 East Second Street, Los Angeles, California 90013.

21.2 The copy of any protest shall be received in the office designated above on the same day a protest is filed with the GSCA or within one day of filing a protest with the GAO.

22. CONTRACTOR BUSINESS INTEGRITY. Offerors are hereby notified that the apparently successful offeror(s) as a condition for award of any contract resulting from this solicitation may be required to execute a certificate related to business integrity.

* * * * *

REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF BIDDER

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

(a) The Offeror certifies that-

(1) The prices in this offer have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other Offeror or competitor relating to (i) those prices, (ii) the intention to submit an offer, or (iii) the methods or factors used to calculate the prices offered;

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

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

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

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

(2) (i) Has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above

(insert full name of person(s) in the Offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the Offeror's organization);

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

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

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

2. CONTINGENT FEE REPRESENTATION AND AGREEMENT (APR 1984) FAR 52.203-4.

(a) Representation. The Offeror represents that, except for full-time bona fide employees working solely for the Offeror, the Offeror-

(Note: The Offeror must check the appropriate boxes. For interpretation or the representation, including the term "bona fide employee," see Subpart 3.4 of the Federal Acquisition Regulation.)

(1) has, has not employed or retained any person or company to solicit or obtain this contract; and

(2) has has not paid or agreed to pay to any person or company employed or retained to solicit or obtain this contract any commission, percentage, brokerage, or other fee contingent upon or resulting from the award of this contract.

(b) Agreement. The Offeror agrees to provide information relating to the above Representation as requested by the Contracting Officer and, when subparagraph (a)(1) or (a)(2) is answered affirmatively, to promptly submit to the Contracting Officer-

- (1) A completed Standard Form 119, Statement of Contingent or Other Fees, (SF 119); or
- (2) A signed statement indicating that the SF 119 was previously submitted to the same contracting office, including the date and applicable solicitation or contract number, and representing that the prior SF 119 applies to this offer or quotation.

3. TYPE OF BUSINESS ORGANIZATION-SEALED BIDDING (JUL 1987) FAR 52.214-2.

The bidder, by checking the applicable box, represents that --

- (a) It operates as a corporation incorporated under the laws of the State of _____, an individual, a partnership, a nonprofit organization, or a joint venture; or
- (b) If the bidder is a foreign entity, it operates as an individual, a partnership, a nonprofit organization, a joint venture, or a corporation, registered for business in _____ country

4. PARENT COMPANY AND IDENTIFYING DATA (APR 1984) FAR 52.214-8.

- (a) A "parent" company, for the purpose of this provision, is one that owns or controls the activities and basic business policies of the bidder. To own the bidding company means that the parent company must own more than 50 percent of the voting rights in that company. A company may control a bidder as a parent even though not meeting the requirement for such ownership if the parent company is able to formulate, determine, or veto basic policy decisions of the Offeror through the use of dominant minority voting rights, use of proxy voting or otherwise.
- (b) The bidder is, is not (check applicable box) owned or controlled by a parent company.
- (c) If the bidder checked "is" in paragraph (b) above, it shall provide the following information:

Name and Main Office Address
of Parent Company
(including Zip Code)

Parent Company's Employer's
Identification Number

- (d) If the bidder checked "is not" in paragraph (b) above, it shall insert its own Employer's Identification Number on the following line _____.

5. SMALL BUSINESS CONCERN REPRESENTATION (MAY 1986) FAR 52.219-1.

The Offeror represents and certifies as part of its offer that it is, is not a small business concern and that all, not all end items to be furnished will be manufactured or produced by a small business concern in the United States, its territories or possessions, Puerto Rico, or the Trust Territory of the Pacific Islands. "Small business concern," as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the size standards in this solicitation.

6. SMALL DISADVANTAGED BUSINESS CONCERN REPRESENTATION (DoD FAR SUPPLEMENT DEVIATION) (JUN 1988) DFARS 252.219-7005.

(a) Definition. "Small disadvantaged business concern," as used in this provision, means a small business concern, including mass media, owned and controlled by individuals who are both socially and economically disadvantaged, as defined in regulations prescribed by the U.S. Small Business Administration at 13 CFR Part 124, the majority of earnings of which directly accrue to such individuals. (13 CFR Part 124 generally provides that a small disadvantaged business concern is a small business concern (1) which is at least fifty-one percent (51%) owned by one or more socially and economically disadvantaged individuals; or in the case of any publicly owned business, at least fifty-one percent (51%) of the voting 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.) (See 13 CFR 124.101 through 124.110.)

(b) Representation. The Offeror represents that its qualifying ownership falls within at least one of the following categories, as defined in 13 CFR 124 (check the applicable categories):

- Subcontinent Asian (Asian-Indian) American (US Citizen) originally from India, Pakistan, Bangladesh, or Sri Lanka)
- Asian-Pacific American (US Citizen with origins from Japan, China, The Philippines, Vietnam, Korea, Samoa, Guam, U.S. Trust Territory of the Pacific Islands, Northern Mariana Islands, Laos, Cambodia, or Taiwan)
- Black American (US Citizen)
- Hispanic American (US Citizen with origins from South America, Central America, Mexico, Cuba, the Dominican Republic, Puerto Rico, Spain or Portugal)
- Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians)
- Individual/concern currently certified for participation in the Minority Small Business and Capital Ownership Development Program under section 8(a) of the Small Business Act (15 U.S.C. 637(a))
- Other (in addition to (c)(1), Offeror must complete (c)(2) below)

(c) Certification.

- (1) The Offeror represents and certifies, as part of its offer, that it is _____, is not _____ a small disadvantaged business concern.
- (2) (Complete only if item (b) above is checked "Other")

The Offeror represents and certifies, as part of its offer, that the Small Business Administration (SBA) has _____, has not _____ made a determination concerning the Offeror's status as a small disadvantaged business concern. If the SBA has made such a determination, the date of the determination was _____ and the Offeror certifies that it was _____, was not _____ found by the SBA to be socially and economically disadvantaged as a result of that determination and that no circumstances have changed to vary that determination.

(d) Notification. The Offeror agrees to notify the Contracting Officer before award of any change in its status as a small disadvantaged business concern occurring between the submission of its offer and contract award.

(e) Penalty. The Offeror represents and certifies that the above information is true and understands that whoever for the purpose of securing a contract or subcontract under subsection (a) of Section 1207 of Public Law 99-661 misrepresents the status of any concern or person as a small business concern owned and controlled by a minority (as described in subsection (a)) shall be punished by a fine of not less than \$10,000 or by imprisonment for not more than a year, or both.

7. WOMEN-OWNED SMALL BUSINESS REPRESENTATION (APR 1984) FAR 52.219-3.

(a) Representation. The Offeror represents that it is, is not a women-owned small business concern.

(b) Definitions.

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

"Women-owned," as used in this provision, means a small 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.

8. CERTIFICATION OF NONSEGREGATED FACILITIES (APR 1984) FAR 52.222-21.

(a) "Segregated facilities," as used in this provision, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin because of habit, local custom, or otherwise.

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

(c) The Offeror further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will-

(1) Obtain identical certifications from proposed subcontractors before the award of subcontracts under which the subcontractor will be subject to the Equal Opportunity clause;

(2) Retain the certifications in the files; and

(3) Forward the following notice to the proposed subcontractors (except if the proposed subcontractors have submitted identical certifications for specific time periods):

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENTS FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES.

A Certification of Nonsegregated Facilities must be submitted before the award of a subcontract under which the subcontractor will be subject to 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. PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (APR 1984) FAR 52.222-22.

The Offeror represents that-

(a) It has, has not participated in previous contract or subcontract subject either to the Equal Opportunity clause of this solicitation, the clause originally contained in Section 310 of Executive Order No. 10925, or the clause contained in Section 201 of Executive Order No. 11114;

- (b) It has, has not, filed all required compliance reports; and
(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

10. CLEAN AIR AND WATER CERTIFICATION (APR 1984) FAR 52.223-1.

The Offeror certifies that-

- (a) Any facility to be used in the performance of this proposed contract is , is not listed on the Environmental Protection Agency List of Violating Facilities;
(b) The Offeror will immediately notify the Contracting Officer, before award, of the receipt of any communication from the Administrator, or a designee, of the Environmental Protection Agency, indicating that any facility that the Offeror proposes to use for the performance of the contract is under consideration to be listed on the EPA List of Violating Facilities; and
(c) The Offeror will include a certification substantially the same as this certification, including this paragraph (c), in every nonexempt subcontract.

11. DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER REPORTING (DEC 1980) DFARS 252.204-7004.

In the block with its name and address, the Offeror should supply the Data Universal Numbering System (DUNS) Number applicable to that name and address. The DUNS Number should be preceded by "DUNS:". If the Offeror does not have a DUNS Number, it may obtain one from any DUN and Bradstreet branch office. No Offeror should delay the submission of its offer pending receipt of its DUNS Number.

12. PREFERENCE FOR LABOR SURPLUS AREA CONCERNS (NOV 1987) DFARS 252.209-700.

- (a) This acquisition is not set aside for labor surplus area (LSA) concerns. However, the Offeror's status as such a concern may affect (1) entitlement to award in case of tie offers or (2) offer evaluation in accordance with the Buy American Act clause of this solicitation. In order to determine whether the Offeror is entitled to a preference under (1) or (2) above, the Offeror must identify, below, the LSA in which the costs to be incurred on account of manufacturing or production (by the Offeror or the first-tier subcontractors) amount to more than 50 percent of the contract price.

(b) Failure to identify the locations as specified above will preclude consideration of the Offeror as an LSA concern. If the Offeror is awarded a contract as an LSA concern and would not have otherwise qualified for award, the Offeror shall perform the contract or cause the contract to be performed in accordance with the obligations of an LSA concern.

13. CERTIFICATION OR DISCLOSURE OF OWNERSHIP OR CONTROL BY A FOREIGN GOVERNMENT THAT SUPPORTS TERRORISM (NOV 1987) DFARS 252.209-7000.

- (a) "Significant interest" as used in this provision means
(1) Ownership of or beneficial interest in five percent (5%) or more of the firm's or subsidiary's securities. Beneficial interest includes holding five percent (5%) or more of any class of the firm's securities in "nominee shares", "street names", or some other method of holding securities that does not disclose the beneficial owner;

- (2) Holding a management position in the firm such as director or officer;
 - (3) Ability to control or influence the election or appointment of directors or officers of the firm;
 - (4) Ownership of ten percent (10%) or more of the assets of a firm such as equipment, buildings, real estate, or other tangible assets of the firm; or
 - (5) Holding fifty percent (50%) or more of the indebtedness of a firm.
- (b) Unless paragraph (c) below has been completed, the Offeror, by submission of its offer, certifies, to the best of its knowledge and belief, that no government of a foreign country, or agent or instrumentality of a foreign country, listed below, has, directly or indirectly, a significant interest in the Offeror or, if the Offeror is a subsidiary, in the firm that owns or controls, directly or indirectly, the Offeror. Such countries currently include:
- (1) Cuba;
 - (2) Iran;
 - (3) Libya;
 - (4) Syria; and
 - (5) South Yemen.
- (c) If the Offeror is unable to certify in accordance with (b) above, the Offeror represents that the following country or countries (listed in (b) above) or an agent or instrumentality of such country or countries, have a significant interest in the Offeror's firm:

Country _____
 Significant Interest _____

14. TAXPAYER IDENTIFICATION (NOVEMBER 1988) FAR 52.204-3.

(a) Definitions.

"Common parent", as used in this solicitation provision, means an offeror that is a member of an affiliated group of corporations that files its Federal income tax returns on a consolidated basis.

"Corporate status", as used in this solicitation provision, means a designation as to whether the offeror is a corporate entity, an unincorporated entity (e.g., sole proprietorship or partnership), or a corporation providing medical and health care services.

"Taxpayer Identification Number (TIN)", as used in this solicitation provision, means the number required by the IRS to be used by the Contractor in reporting income tax and other returns.

(b) The Offeror is required to submit the information required in paragraphs (c) through (e) of this solicitation provision in order to comply with reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M and implementing regulations issued by the Internal Revenue Service (IRS). If the resulting contract is subject to reporting requirements described in FAR 4.902(a), the failure or refusal by the Offeror to furnish the information may result in a 20 percent reduction of payments otherwise due under the contract.

(c) Taxpayer Identification Number (TIN).

TIN: _____

TIN has been applied for.

TIN is not required because:

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

Offeror is an agency or instrumentality of a foreign government;

Offeror is an agency or instrumentality of a state or local government;

Other. State Basis. _____

(d) Corporate Status.

- Corporation providing medical and health care services or engaged in the billing and collecting of payments for such services
- Other corporate entity
- Not a corporate entity
- Sole proprietorship
- Partnership
- Hospital or extended care facility described in 26 CFR 501(c)(3) that is exempt from taxation under 26 CFR 501(a)

(e) Common Parent.

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

Name and TIN of common parent:

Name: _____

Tin: _____

15. SMALL BUSINESS CONCERN REPRESENTATION FOR THE SMALL BUSINESS COMPETITIVE DEMONSTRATION PROGRAM (JAN 1989) DFARS 252.219-7012.

(a) Definition.

"Emerging Small Business", as used in this solicitation, means a Small Business Concern whose size is no greater than 50 percent (50%) of the numerical size standard applicable to the standard industrial classification code assigned to a contracting opportunity.

(b) (Complete only if offeror has certified itself under the clause at FAR 52.219-1 as a small business concern under the size standards of this solicitation.)

The offeror represents and certifies as part of its offer that it is , is not , an emerging small business.

(c) (Complete only if the offeror is a Small Business or an Emerging Small Business, indicating its size range.)

Offeror's number of employees for the past twelve months or offeror's average gross revenue for the last three fiscal years. (Check one of the following:)

No. of Employees	Ave. Annual Gross Revenues
50 or fewer	\$1 Million or less
51 - 100	\$1,000,001 - \$2 Million
101 - 250	\$2,000,001 - \$3.5 Million
251 - 500	\$3,500,001 - \$5 Million
501 - 750	\$5,000,001 - \$10 Million
751 - 1,000	\$10,000,001 - \$17 Million
over 1,000	over \$17 Million

16. CERTIFICATION REGARDING A DRUG-FREE WORKPLACE (MAR 1989) FAR 52.223-5.

(a) Definitions. As used in this provision:

"Controlled substance" means a controlled substance in schedules I through V of section 202 of the Controlled Substances Act (21 U.S.C. 812) and as further defined in regulation at 21 CFR 1308.11 - 1308.15.

"Conviction" means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes.

"Criminal drug statute" means a Federal or non-Federal criminal statute involving the manufacture, distribution, dispensing, possession, or use of a controlled substance.

"Drug free workplace" means a site for the performance of work done in connection with a specific contract at which employees of the Contractor are prohibited from engaging in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance.

"Employee" means an employee of a Contractor directly engaged in the performance of work under a Government contract.

"Individual" means an offeror/Contractor that has no more than one employee including the offeror/Contractor.

(b) By submission of its offer, the offeror, if other than an individual, who is making an offer that equals or exceeds \$25,000, certifies and agrees, that with respect to all employees of the offeror to be employed under a contract resulting from this solicitation, it will --

(1) Publish a statement notifying such employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition;

(2) Establish a drug-free awareness program to inform such employees about --

(i) The dangers of drug abuse in the workplace;

(ii) The Contractor's policy of maintaining a drug-free workplace;

(iii) Any available drug counseling, rehabilitation, and employee assistance programs; and

(iv) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

(3) Provide all employees engaged in performance of the contract with a copy of the statement required by subparagraph (b)(1) of this provision;

(4) Notify such employees in the statement required by subparagraph (b)(1) of this provision, that as a condition of continued employment on the contract resulting from this solicitation, the employee will --

(i) Abide by the terms of the statement; and

(ii) Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five (5) days after such conviction;

(5) Notify the Contracting Officer within ten (10) days after receiving notice under subdivision (b)(4)(ii) of this provision, from an employee or otherwise receiving actual notice of such conviction; and

(6) Within thirty (30) days after receiving notice under subparagraph (a)(4) of this provision of a conviction, impose the following sanctions or remedial measures on any employee who is convicted of drug abuse violations occurring in the workplace:

(i) Take appropriate personnel action against such employee, up to and including termination; or

(ii) Require such employees to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by the Federal, State, or local health, law enforcement, or other appropriate agency.

(7) Make a good faith effort to maintain a drug-free workplace through implementation of subparagraphs (b)(1) through (b)(6) of this provision.

(c) By submission of its offer, the offeror, if an individual who is making an offer of any dollar value, certifies and agrees that the offeror will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in the performance of the contract resulting from this solicitation.

(d) Failure of the offeror to provide the certification required by subparagraphs 17.2 or 17.3 of this provision, renders the offeror unqualified and ineligible for award. (See FAR 9.104-1(g) and 19.602-1(a)(2)(i)).

(e) In addition to other remedies available to the Government, the certification in paragraphs (b) and (c) of this provision concerns a matter within the jurisdiction of an agency of the United States and the making of false, fictitious, or fraudulent certifications may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

17. REQUIREMENT FOR CERTIFICATE OF PROCUREMENT INTEGRITY (MAY 1989) FAR 52.203-8.

(a) Definitions. The definitions at FAR 3.104-4 are hereby incorporated in this provision.

(b) Certifications. As required in paragraph (c) of this provision, the officer or employee responsible for this offer shall execute the following certification:

CERTIFICATE OF PROCUREMENT INTEGRITY

(1) I, [Name of certifier], am the officer or employee responsible for the preparation of this offer or bid and hereby certify that, to the best of my knowledge and belief, with the exception of any information described in this certificate, I have no information concerning a violation or possible violation of subsection 27(a), (b), (c), or (e) of the Office of Federal Procurement Policy Act* (41 U.S.C. 423) (hereinafter referred to as "the Act"), as implemented in FAR, occurring during the conduct of this procurement (solicitation number).

(2) As required by subsection 27(d)(1)(B) of the Act, I further certify that each officer, agent, representative, and consultant of [Name of Offeror] who has participated personally and substantially in the preparation or submission of this offer has certified that he or she is familiar with, and will comply with, the requirements of subsection 27(a) of the Act, as implemented in the FAR, and will report immediately to me any information concerning a violation of the Act, as implemented in the FAR, pertaining to this procurement.

(3) Violations or possible violations: (Continue on plain bond paper if necessary and label Certificate of Procurement Integrity (Continuation Sheet), ENTER "NONE" IF NONE EXISTS)

[Signature of the Officer or Employee Responsible for the Offer and date]

[Typed Name of the Officer or Employee Responsible for the Offer]

*Section 27 became effective on July 16, 1989.

THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER TITLE 18, UNITED STATES CODE, SECTION 1001.

(End of Certification)

(c) The signed certification in paragraph (b) of this provision shall be executed and submitted as follows:

(1) If this is an invitation for bids (IFB), with bid submissions exceeding \$100,000.

(2) If this is a procurement using two-step sealed bidding procedure (see FAR Subpart 14.5), with bids exceeding \$100,000, with submission to the Government of step-two sealed bids.

(3) If this is a request for proposal (RFP) or quotation (RFQ), by the successful offeror as close as practicable to, but in no event later than, the date of award of a contract exceeding \$100,000.

(4) If this is an invitation for bids for an indefinite delivery-type contract, and if the estimated value of orders to be placed under the contract is expected to exceed \$100,000, with the bid submission.

(5) If this is an RFQ or RFP for an indefinite delivery-type contract, and if the estimated value of orders expected to be placed under the contract is expected to exceed \$100,000, by the successful offeror as close as practicable to, but in no event later than, the date of contract award.

(6) For letter contracts, prior to award of the letter contract and prior to definitization of the letter contracts.

(7) For other procurement actions in excess of \$100,000, prior to award or execution as specified by the Contracting Officer.

(8) The certificate required by subparagraphs (c)(3) and (c)(5) through (c)(7) of this provision shall be submitted to the Contracting Officer within the time period specified by the Contracting Officer when requesting the certificate.

(d) Pursuant to FAR 3.104-9(d), the offeror may be requested to execute additional certifications at the request of the Government.

(e) Failure of an offeror to submit the certification required by FAR 3.104-9(b) or any additional certifications pursuant to FAR 3.104-9(d) will render the offeror ineligible for contract award (see FAR 9.104-1(g)).

(f) A certification containing a disclosure of a violation or possible violation will not necessarily result in the withholding of award under this solicitation. However, the Government, after evaluation of the disclosure, may cancel this procurement or take any other appropriate actions in the interest of the Government, such as disqualification of the offeror.

(g) In making the certification in subparagraph (b)(2) of this provision, the offeror may rely upon the certification by an officer, employee, agent, representative, or consultant that such person is in compliance with the requirements of subsections 27(a), (b), (c), or (e) of the Office of Federal Procurement Policy Act (41 U.S.C. 423), as implemented in the FAR, unless the offeror knows, or should have known, of reasons to the contrary. The offeror may rely upon periodic certifications that must be obtained at least annually, supplemented with periodic training programs. These certifications shall be maintained by the Contractor for 6 years from the date of execution.

(h) The certifications in paragraph (b) and (d) of this provision are a material representation of fact upon which reliance will be placed in awarding a contract.

18. COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (OCT 1987) DFARS 252.204-7007.

In the block with its name and address, the Offeror should supply the CAGE code applicable to that name and address. The CAGE code should be preceded by "CAGE:". If the Offeror does not have a CAGE code, the Offeror may request the Contracting Officer to initiate a DD Form 2051. The Contracting Activity will complete Section A and the Offeror must complete Section B of the DD Form 2051. A CAGE code will be assigned when a completed DD Form 2051 is received by the Defense Logistics Center, Attn: DLSC-FBA, Federal Center, 74 N. Washington, Battle Creek, MI 49017-3084. No Offeror should delay the submission of its offer pending receipt of its CAGE code.

19. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (MAY 1989) FAR 52.209-5.

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

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

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

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

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

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

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

THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER TITLE 18, UNITED STATES CODE, SECTION 1001.

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

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

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

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

* * * * *

CLAUSES INCORPORATED BY REFERENCE - Alternate I (JUN 1988) FAR 52.252-2.

This contract incorporates the following clauses (listed on Pages C-2 through C-5) by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

- I. FEDERAL ACQUISITION REGULATIONS (48 CFR CHAPTER 1) CLAUSES.
- II. ENGINEER FEDERAL ACQUISITION REGULATION SUPPLEMENT (EFARS) CLAUSES.
- III. DEPARTMENT OF DEFENSE FAR SUPPLEMENT (DFARS) (48 CFR CHAPTER 2) CLAUSES.

(End of Clause)

The full text of these clauses may be obtained from Contracting Division, P.O. Box 2711, Los Angeles, California, 90053-2325, or in person at Brunswig Square Building, 360 East Second Street, Room 300, Los Angeles, California, 90013.

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U.S. Department of Labor



GENERAL WAGE DECISION NO. AZ89-1

Supersedes General Wage Decision No. AZ88-1

State: ARIZONA

County(ies): Maricopa

Construction Type: Building

Construction Description: Building Projects (does not include single family homes and apartments up to and including 4 stories)

Modification Record:

No.
1

Publication Date
Mar. 31, 1989

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	Basic Hourly Rates	Fringe Benefits
ASBESTOS WORKERS:		
Commercial	14.00	3.33
Industrial	19.68	4.50
BOILERMAKERS	18.86	4.50
BRICKLAYERS; Stonemasons	11.50	3.04
CARPENTERS:		
Carpenters; Saw Filer; Shingler; and Drywall; Hangers	15.665	2.55
Floor Layer and Piledriver	16.01	2.55
Millwrights	16.29	2.59
CEMENT MASONS:		
Cement Masons	13.99	3.05
Concrete Troweling ; Sawing and Scor- ing, Curb and Gutter, Grinding Ma- chine Operator; Clary and similar type of power Screed; Color pigment; Steps; Composition Finisher	14.20	3.05
DRYWALL TAPERS	15.06	1.20
ELECTRICIANS:		
Electricians	12.18	1.32
Sound Installers	16.00	2.14+ 3%
ELEVATOR CONSTRUCTORS:		
Mechanics	16.62	4.32+ a
Helpers	11.63	4.32+ a
Probationary Helpers	8.31	
GLAZIERS	15.39	1.78
INSULATION INSTALLERS	8.57	
*IRONWORKERS	16.00	5.40
LABORERS	7.55	
LANDSCAPE SPRINKLER FITTER/INSTALLER	6.65	
LANDSCAPE LABORER	4.59	
LINE CONSTRUCTION:		
Groundmen	13.41	4.75+ 3.5%
Equipment Operator; Powdermen & Mech- anics	15.83	4.75+ 3.5%
Linemen, Crane Operator, Sagger, and Pilot	18.15	4.75+ 3.5%
Cable splicers	18.66	4.75+ 3.5%
PAINTERS:		
Brush and Roller; Sandblaster (No- zzleman); Sheetrock Taper; Floor Coverer; Sandblaster (pot tender)	13.54	1.30
Spray; Paperhanger	13.79	1.30
Creosote Applier	13.87	1.30
Swing Stage:		
Brush; Sandblaster	13.94	1.30
Spray	14.19	1.30
Steeplejack	14.40	1.30
Steel and Bridge, Brush; Nozzle- man and Pot Tender; Steel (steam cleaner); Electric and Air Tool Operator; Steel Sandblaster	14.47	1.30
Steel and bridge, Spray	14.67	1.30



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PLASTERERS	15.69	3.06
*PLUMBERS	16.50	4.33
ROOFERS	10.84	2.11
SHEET METAL WORKERS	16.50	3.30
SOFT FLOOR LAYERS	12.46	.92
SPRINKLER FITTERS	19.28	3.80
TILE, MARBLE, and TERRAZZO WORKERS	13.74	2.76
TILE FINISHERS	11.77	1.79
POWER EQUIPMENT OPERATORS:		
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Group 9	18.34	3.28
TRUCK DRIVERS:		
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Group 4	14.15	2.87
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Group 8A	17.67	2.87
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FOOTNOTE:

- a. Employer contributes 8% of basic hourly rate for 5 years' service and 6% basic hourly rate for 6 months' to 5 years' service as Vacation Pay Credit. Seven Paid Holidays: New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; Friday after Thanksgiving; and Christmas Day

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

POWER EQUIPMENT OPERATORS

Group 1: Air Compressor Operator; Pump Operator; Conveyor Operator; Generator Operator (all); Power Grizzly Operator; Fireman (all); Welding Machine Operator; Tripper Operator; Concrete Mixer Operator, skip type; Highline Cableway Signalman

Group 2: Oiler; Forklift and Ross Carrier Operator; Skiploader, 1 1/2 cu. yd. and less; Pavement Breaker; Roller Operator (except as otherwise classified); Wheel-type Tractor Operator (Ford-Ferguson type); Slurry Seal Machine Operator (driver Moto-paver); Power Sweeper



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Group 3: Self-propelled Chip Spreading Machine; Conveyor Operator; Dinky Operator, under 20 ton; Elevator Hoist Operator, Husky and similar

Group 4: Motor Crane Driver; Beltcrete Operator; Curing Machine Operator, Boring Bridge and Texture; Cross Tineing and Pipe Float; Straw Blower; Hydrographic Seeder; Hydrographic Mulcher; Jumbo Finishing Machine; Joint Inserter

Group 5: A-Frame Boom Truck or Winch Truck Operator; Grade Checker (excluding Civil Engineer); Multiple Power Concrete Saw Operator; Screed Operator; Stationary Pipe Wrapping and Cleaning Machine Operator; Tugger Operator

Group 6: Aggregate Plant Operator (including crushing, screening, and sand plants, etc.); Asphalt Laydown Machine Operator; Asphalt Plant Mixer Operator; Boring Machine Operator; Concrete Mechanical Tamping, Spreading or Finishing Machine Operator (including Clary, Johnson or similar types); Concrete Pump Operator; Concrete Batch Plant Operator, all types and sizes; Conductor, Brakeman, or Handler; Drilling Machine Operator, all types and sizes except as otherwise classified; Field Equipment Serviceman; Kolman Belt Loader Operator or similar type, with belt width 48" or over; Locomotive Engineer (including Dinky 20 tons weight and over); Moto-paver and similar type equipment Operator; Operating Engineer Rigger; Pneumatic-tired Scraper Operator, up to and including 12 cu. yds. (Turnapull, Euclid, Cat, D.W. Hancock, and similar equipment); Power Jumbo Form Setter Operator; Pressure Grout Machine Operator (as used in heavy engineering construction); Road Oil Mixing Machine Operator; Roller Operator, on all type asphalt pavement; Self-propelled Compactor, with blade; Skip Loader Operator, all types with a rated capacity over 1-1/2 but less than 4 cu. yds.; Slip Form Operator (power driven lifting device for concrete forms); Soil Cement Road Mixing Machine Operator, single pass type; Stationary Central Generating Plant Operator, rated 300 K.W. or more; Surface Heater and Planer Operator; Traveling Pipe-wrapping Machine Operator

Group 7: Pneumatic-tired Scraper Operator, all sizes and types over 12 cu. yds. MRC (Turnapull, Euclid, Cat, D.W. Hancock and similar equipment); Tractor Operator (Pusher, Bulldozer, Scraper); Trenching Machine Operator

Group 8: Asphalt or Concrete Planing, Rotomill, and Milling Machine Operator; Auto Grade Machine Operator (CMI and similar equipment); Boring Machine Operator (including Mole, Badger and similar type); Concrete Mixer Operator, paving type and Mobile Mixers; Concrete Pump Operator, with boom attached (truck mounted); Crane Operator, Crawler and Pneumatic type under 100 ton capacity MRC; Crawler-type Tractor Operator, with boom attachment or Slope Bar; Derrick Operator; Forklift Operator for hoisting personnel; Gradall Operator; H. D. Mechanic and/or Welder; Helicopter Hoist Operator; Highline Cableway Operator (less than 20 tons rated capacity); Mass Excavator Operator (150 Bucyrus Erie and similar types); Mechanical Hoist Operator (two or more drums); Motor Grader Operator, any type power blade; Motor Grader Operator, with



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Elevating Grader attachment; Mucking Machine Operator;

Overhead Crane Operator; Piledriver Engineer (portable, stationary or skid rig); Pneumatic-tired Scraper Operator, all sizes and types (Turnapull, Euclid, Cat, D.W. Hancock and similar equipment over 45 cu. yds. MRC); Power driven Ditch Lining or Ditch Trimming Machine Operator; Skip Loader Operator, all types rated capacity 4 cu. yd. but less than 8 cu. yds.; Slip Form Paving Machine Operator (including Gunnert, Zimmerman and similar types); Specialized Power Digger Operator, attached to wheel-type tractor; Tower Crane (or similar type) Operator; Tugger Operator (two or more); Universal Equipment Operator, Shovel, Backhoe, Dragline, Clamshell, etc., up to 8 cu. yds.

Group 9: Crane Operator, Pneumatic or Crawler, 100 ton hoisting capacity and over MRC rating; Helicopter Pilot, FAA qualified, when used in construction work other than executive travel and single casual rental; Highline Cableway Operator, over 20 ton rated capacity and using traveling head and tail tower; Remote-control Earth Moving Equipment Operator; Skip Loader Operator, all types with rated capacity of 8 cu. yds. or more; Universal Equipment Operator, Shovel, Backhoe, Dragline, Clamshell, etc., 8 cu. yds. and over

TRUCK DRIVERS

Group 1: Teamsters; Pick-ups; Station Wagon; Man Haul Driver

Group 2: Dump or Flatrack (2 or 3 axle); Water Truck (under 2500 gallons); Buggymobile (1 cu. yd. or less); Bus Driver; Self-propelled Street Sweeper; Shop Greaser

Group 3: Dump or Flatrack (4 axle); Dumptor or Dumpster (less than 7 cu. yds.); Water Truck (2500 gallons but less than 4000 gallons); Tireman

Group 4: Dumptor or Dumpster (7 cu. yds. but less than 16 cu. yds.); Dump or Flatrack (5 axle); Water Truck (4000 gallons and over); Slurry type equipment Driver or Leverman; Vacuum Pump Truck Drivers; Flaherty Spreader or similar type equipment or Leverman; Transit Mix (8 cu. yds. or less mixer capacity); Ambulance Driver

Group 5: Dump or Flatrack (6 axle); Transit Mix (over 8 cu. yds. but less than 10.5 cu. yds.); Rock Truck (i.e. Dart, Euclid and other similar type end dumps, single unit) less than 16 cu. yds.

Group 5A: Oil Tanker or Spreader and/or Bootman, Retortman or Leverman

Group 6: Transit Mix (over 10.5 cu. yds. but less than 14 cu. yds. mixer capacity); Ross Carrier, Fork Lift or Lift Truck; Hydro Lift, Swedish Crane, Iowa 300 and similar types; Concrete Pump (when integral part of transit Mix Truck); Dump



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or Flatrack (7 axle); Transport Driver (unless axle rating results in higher classification)

Group 7: Dump or Flatrack (8 axle)

Group 8: Off-highway equipment Driver including but not limited to: 2 or 4 wheel power unit, i.e. Cat, DW Series, Euclid, International and similar type equipment, transporting material when top loaded or by external means including pulling Water Tanks, Fuel Tanks or other applications under Teamster Classifications; Rock Trucks (Dart, Euclid, or other similar end dump types) 16 cu. yds. and over; Eject-alls; Dumptor or Dumpster (16 cu. yds. and over); Dump or Flatrack (9 axle)

Group 8A: Heavy-duty Mechanic/Welder; Body and Fender Man

Group 8B: Field Equipment Servicemen or Fuel Truck Driver

Group 8C: Body and Fender Man

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

S P E C I F I C A T I O N S

for

NEW RIVER EROSION CONTROL
AND ESTHETIC TREATMENT

Maricopa County, Arizona

Authority:

Public Law 89-298
Flood Control Act of 1965

Appropriation:

96x3122, Construction, General

96x8862, Contributed Funds, Required
Corps of Engineers, Civil



**US Army Corps
of Engineers**

Los Angeles District

SPECIAL CLAUSES

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2. Liquidated Damages-Construction
3. Contract Drawings, Maps and Specifications
4. Submittals
5. Physical Data
6. Damage to Work
7. Equipment Ownership and Operating Expense Schedule
8. Performance of Work by the Contractor
9. Performance Evaluation of Contractor
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11. As-Built Drawings
12. Notice of Priority Rating for National Defense Use
13. Time Extension for Unusually Severe Weather

1. COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (1984 APR) FAR 52.212-3. The Contractor shall be required to (a) commence work under this contract within 5 calendar days after the date the Contractor receives the Notice to Proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than 150 calendar days after the date of receipt of Notice to Proceed, except for seeding and planting. Seeding and planting shall be completed as soon as practicable and within the time limits stated in the Technical Provisions or as directed by the Contracting Officer. The time stated for completion shall include final cleanup of the premises.

2. LIQUIDATED DAMAGES-CONSTRUCTION (APR 1984) FAR 52.212-5.

2.1 If the Contractor fails to complete the work within the time specified in the contract, or any extensions, the Contractor shall pay to the Government as liquidated damages, the sum of \$255.00 for each day of delay.

2.2 If the Government terminates the Contractor's right to proceed, the resulting damage will consist of 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.

2.3 If the Government does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted.

3. CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS (SEP 1987) DFARS 252.236-7002.

3.1 Ten sets of large scale contract drawings and specifications will be furnished the Contractor without charge except applicable publications incorporated into the technical provisions by reference. Additional sets will be furnished on request at the cost of reproduction. One set of reproducible will be furnished the Contractor on a one-time basis in lieu of the above contract drawings at the option of the Contracting Officer. The work shall conform to the specifications and the following contract drawings identified on the following index of drawings:

Title	File and Drawing No.
Index to Contract Drawings	252/818 (1 of 22)

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

3.3 The Contractor shall check all drawings furnished him immediately upon their receipt and shall promptly notify the Contracting Officer of any discrepancies. Figures marked on drawings shall in general be followed in preference to scale measurements. Large scale drawings shall in general govern small scale drawings. The Contractor shall compare all drawings and verify the figures before laying out the work and will be responsible for any errors which might have been avoided thereby.

4. SUBMITTALS (May 15 1984) ER 415-1-10.

4.1 General. Reference is made to the CONTRACT CLAUSE: SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION. The Contractor shall submit for approval all shop drawings, certificates of compliance, equipment data, and/or material samples called for by these specifications.

4.2 Submittal Register (28 March 1986) DTL 1110-1-4. Within 15 days after receipt of Notice to Proceed, the Contractor shall complete and submit to the Contracting Officer, in duplicate, a Submittal Register (ENG FORM 4288) listing all submittals required under the Contract (including the Contract Clause, the Special Clauses, and the Technical Provisions) and dates of submittals. In addition to those items listed on ENG FORM 4288, the Contractor shall furnish submittals for any proposed deviations from the plans or specifications. The scheduled need dates shall be recorded on the Register for each item for control purposes. In preparing the Register, adequate time (a minimum of 30 days) will be allowed for review, approval and possible resubmittal. Scheduling shall be coordinated with the approved progress schedule. The Contractor's Quality Control Representative shall review the Register at least every 30 days and take appropriate action to maintain an effective system. Copies of updated or corrected Registers shall be submitted to the Contracting Officer at least every 60 days in the quantity specified. Payment will not be made for any material, equipment, or service which does not comply with contract requirements.

4.2.1 The attached Submittal Register is a minimum listing of the submittals that the Contractor shall submit to the Contracting Officer. The Contractor shall complete those columns in the Submittal Register (ENG FORM 4288) entitled "NAS Activity Code", "Submittal Identification Number", and "Contractor Schedule Dates". The Contractor shall coordinate the Submittal Register with the specific detailed requirements of the Technical Provisions of the contract.

4.2.2 The listing of submittals in the Submittal Register shall not relieve the Contractor from providing additional submittals required by the Contracting Officer under the provisions of the Contract Clauses.

4.3 Transmittals. The Contractor shall complete ENG FORM 4025, "Transmittal of Shop Drawings, Equipment Data, Material Samples, or Manufacturer's Certificates of Compliance" with each set of shop drawings, certificates, equipment data or samples submitted. Blank ENG FORM 4025 will be furnished by the Contracting Officer on request. Six (6) copies of each submittal will be required.

4.4 Shop Drawings. The Contractor shall submit to the Contracting Officer for approval six (6) copies of all shop drawings called for by these specifications. One set will be returned to the Contractor.

4.5 Certificates of Compliance (1969 MAY OCE) EFARS 52.2/9108(c). Any certificates required for demonstrating proof of compliance of materials with specification requirements shall be executed in six (6) copies. Each certificate shall be signed by an official authorized to certify in behalf of the manufacturing company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfactory material, if, after tests are performed on selected samples, the material is found not to meet the specific requirements.

4.6 Resubmittals. If a submittal is returned for correction or is not satisfactory and is disapproved by the Contracting Officer, the Contractor shall resubmit the corrected material, in the same quantity, as specified for the original submittal, for approval within 14 days after receipt of the disapproved material.

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

5.1 The indications of physical conditions on the drawings and in the specifications are the result of site investigations by test trenches.

5.2 Weather Conditions. The Contractor shall satisfy himself as to the hazards likely to arise from weather conditions. Complete weather records and reports may be obtained from any U.S. Weather Bureau Office.

5.3 Transportation Facilities. The Contractor shall make his own investigation of the condition of available public and private roads, railroads, and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress at the site of the work. It shall be the Contractor's responsibility to construct and maintain at his own expense, any haul roads required for construction operations.

5.4 Additional Information, including but not necessarily limited to, results of laboratory tests of material encountered in test holes or other explorations and field logs, is available for inspection and study in the office of District Engineer, Geotechnical Branch, Room 6036, 300 North Los Angeles Street, Los Angeles, California.

6. DAMAGE TO WORK (1966 MAR OCE) EFARS 52.2/9109(c). The responsibility for damage to any part of the permanent work shall be as set forth in the CONTRACT CLAUSE: PERMITS AND RESPONSIBILITIES. However, if, in the judgment of the Contracting Officer, any part of the permanent work performed by the Contractor is damaged by earthquake, which damage is not due to the failure of the Contractor to take reasonable precautions or to exercise sound engineering and

construction practices in the conduct of the work, the Contractor will make the repairs as ordered by the Contracting Officer and full compensation for such repairs will be made at the applicable contract unit or lump sum prices as fixed and established in the contract. If, in the opinion of the Contracting Officer, there are no contract unit or lump sum prices applicable to any part of such work an equitable adjustment pursuant to CONTRACT CLAUSE: CHANGES, will be made as full compensation for the repairs of that part of the permanent work for which there are no applicable contract unit or lump sum prices. Except as herein provided, damage to all work from weather or vandalism including temporary construction, utilities, materials, equipment and plant shall be repaired to the satisfaction of the Contracting Officer at the Contractor's expense, regardless of the cause of such damage.

7. EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE. (1985 JAN HQ USACE) EFARS 52.2/9108(f).

7.1 Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a Contractor or subcontractor at any tier shall be based on actual cost data when the Government can determine both ownership and operating costs for each piece of equipment or equipment groups of similar serial and series from the Contractor's accounting records. When both ownership and operating costs cannot be determined from the Contractor's accounting records, equipment costs shall be based upon the applicable provisions of EP 1110-1-8, "Construction Equipment Ownership and Operating Expense Schedule", Region VII. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the Contracting Officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be used or a rate may be developed using the formula provided in the schedule. For forward pricing, the schedule in effect at the time of negotiations shall apply. For retrospective pricing, the schedule in effect at the time the work was performed shall apply.

7.2 Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d)(ii) and FAR 31.205-36 substantiated by certified copies of paid invoices. Rates for equipment rented from an organization under common control, lease-purchase or sale-leaseback arrangements will be determined using the schedule except that rental costs leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees are allowable. Costs for major repairs and overhaul are unallowable.

7.3 When actual equipment costs are proposed and the total amount of the pricing action is over \$25,000, cost or pricing data shall be submitted on Standard Form 1411, "Contract Pricing Proposal Cover Sheet". By submitting cost or pricing data, the Contractor grants to the Contracting Officer or an authorizing representative the right to examine those books, records, documents and other supporting data that will permit evaluation of the proposed equipment costs. After price agreement the Contractor shall certify that the equipment costs or pricing data submitted are accurate, complete and current.

8. PERFORMANCE OF WORK BY THE CONTRACTOR (APR 1984) FAR 52.236-1.

8.1 The Contractor shall perform on the site, and with its own organization, work equivalent to at least thirty-five (35) percent of the total amount of work to be performed under the contract. This percentage may be reduced by a supplemental

agreement of this contract if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the Government.

9. PERFORMANCE EVALUATION OF CONTRACTOR (1985 JAN HQ USACE) EFARS 52.2/9006.

9.1 As a minimum, the Contractor's performance will be evaluated upon final acceptance of the work. However, interim evaluation may be prepared at any time during contract performance when determined to be in the best interest of the Government.

9.2 The format for the evaluation will be SF 1420, and the Contractor will be rated either outstanding, satisfactory, or unsatisfactory in the areas of Contractor Quality Control, Timely Performance, Effectiveness of Management, Compliance with Labor Standards, and Compliance with Safety Standards. The Contractor will be advised of any unsatisfactory rating either in an individual element or in the overall rating, prior to completing the evaluation, and all Contractor comments will be made a part of the official record. Performance Evaluation Reports will be available to all DOD Contracting offices for their future use in determining Contractor responsibility, in compliance with DFARS 36.201(C)(1).

10. HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (APR 1984) FAR 52.223-3.

10.1 The Contractor agrees to submit a Material Safety Data Sheet (Department of Labor Form OSHA-20), as prescribed in Federal Standard No. 313C, for all hazardous material 5 days before delivery of the material, whether or not listed in Appendix A of the Standard. This obligation applies to all materials delivered under this contract which will involve exposure to hazardous materials or items containing these materials.

10.2 "Hazardous material", as used in this clause is as defined in Federal Standard No. 313C, in effect on the date of this contract.

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

10.4 The Contractor shall comply with applicable Federal, state, and local laws, codes, ordinances, and regulations (including the obtaining of licenses and permits) in connection with hazardous material.

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

10.5.1 To use, duplicate, and disclose any data to which this clause is applicable. The purposes of this right are to (i) apprise personnel of the hazards to which they may be exposed in using, handling, packaging, transporting, or disposing of hazardous materials; (ii) obtain medical treatment for those affected by the material; and (iii) have others use, duplicate, and disclose the data for the Government for these purposes.

10.5.2 To use, duplicate, and disclose data furnished under this clause, in accordance with subparagraph 10.5.1 above, in precedence over any other clause of this contract providing for rights in data.

10.5.3 That the Government is not precluded from using similar or identical data acquired from other sources.

10.5.4 That the data shall not be duplicated, disclosed, or released outside the Government, in whole or in part for any acquisition of manufacturing purpose, if the following legend is marked on each piece of data to which this clause applies-

"This is furnished under United States Government Contract No. _____ and shall not be used, duplicated, or disclosed for any acquisition or manufacturing purpose without the permission of _____. This legend shall be marked on any reproduction of this data".

(End of Legend)

10.5.5 That the Contractor shall not place the legend or any other restrictive legend or any data which (i) the Contractor or any subcontractor previously delivered to the Government without limitations or (ii) should be delivered without limitations under the conditions specified in the Federal Acquisition Regulation in the clause at 52.227-18, Rights in Data.

10.6 The Contractor shall insert this clause, including this paragraph, with appropriate changes in the designation of the parties, in subcontracts at any tier (including purchase designations or purchase orders) under this contract involving hazardous material.

11. AS-BUILT DRAWINGS (30 Jul 1986) ER 415-345-38.

11.1 General. The Contractor shall furnish 3 full size sets of as-built blueline prints for use in preparation of as-built drawings by the Government. The as-built prints shall be a record of the construction as installed and completed by the Contractor. They shall include all the information shown on the contract set of drawings and a record of all deviations, modifications, or changes from those drawings, however minor, which were incorporated in the work, all additional work not appearing on the contract drawings, and all changes which are made after final inspection of the contract work. In event the Contractor accomplishes additional work which changes the as-built conditions of the facility after submission of the as-built drawings, the Contractor shall furnish revised and/or additional drawings as required to depict as-built conditions. The requirements for these additional drawings will be the same as for the as-built drawings included in the original submission. The prints shall show the following information, but not be limited thereto:

11.1.1 The location and description of any utility lines or other installations of any kind or description known to exist within the construction area. The location includes dimensions to permanent features.

11.1.2 Correct grade or alignment of roads, structures or utilities if any changes were made from contract plans.

11.1.3 Correct elevations if changes were made in site grading.

11.1.4 Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

11.1.5 The topography and grades of all drainage installed or affected as a part of the project construction.

11.1.6 All changes or modifications which result from the final inspection.

11.1.7 Options. Where contract drawings or specifications allow options, only the option selected for construction shall be shown on the as-built drawings.

11.1.8 Submittal to Contracting Officer for review and approval. Not later than 2 weeks after acceptance of the project by the Government, the Contractor shall deliver to the Contracting Officer 3 full size sets of blue-line prints marked up to depict as-built conditions. If upon review, the drawings are found to contain errors and/or omissions, they shall be returned to the Contractor for corrections. The Contractor shall complete the corrections and return the drawings to the Contracting Officer within ten (10) calendar days.

11.2 Preliminary As-Built Prints. The Contractor shall maintain one set of paper prints to show the as-built conditions. These as-built marked prints shall be kept current and available on the jobsite at all times. All changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. The as-built marked prints will be jointly inspected for accuracy and completeness by the Contracting Officer's representative and responsible representative of the construction Contractor prior to submission of each monthly pay estimate. Information to be included on the preliminary prints shall conform to the requirements of final as-built prints.

12. NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (MAY 1986) FAR 52.212-7. Any contract awarded as a result of this solicitation will be a DO rated order certified for national defense use under the Defense Priorities and Allocations System (DPAS) (15 CFR 350), and the Contractor will be required to follow all of the requirements of this regulation.

13. TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER (DAEN-ECC-Q LTR 3 APR 84).

13.1 This provision specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the CONTRACT CLAUSE: DEFAULT. The listing below defines the monthly anticipated adverse weather for the contract period and is based upon NOAA or similar data for the geographical location of the project.

MONTHLY ANTICIPATED ADVERSE WEATHER CALENDAR DAYS

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
PRECP \geq .10"	2	2	1	0	0	0	2	3	2	2	1	2	17
TEMP \leq 32°F	8	4	1	0	0	0	0	0	0	0	2	7	22
TOTAL	10	6	2	0	0	0	2	3	2	2	3	9	39

13.2 Determination.

13.2.1 The above schedule of anticipated adverse weather will constitute the base line for monthly (or portion thereof) weather time evaluations. Upon acknowledgment of the Notice to Proceed and continuing throughout the contract on a monthly basis, actual adverse weather days will be recorded on a calendar day basis (including weekends and holidays) and compared to the monthly anticipated adverse weather in subparagraph 13.1 above. For purposes of subparagraph 13.2, the term actual adverse weather days shall include days impacted by actual adverse weather days.

13.2.2 The number of actual adverse weather days shall be calculated chronologically from the first to the last day in each month. Once the number of actual adverse weather days anticipated in subparagraph 13.1 above have been incurred, the Contracting Officer will examine any subsequently occurring adverse weather days to determine whether a Contractor is entitled to a time extension. These subsequently occurring adverse weather days must prevent work for 50 percent or more of the Contractor's work day and delay work critical to the timely completion of the project. The Contracting Office will convert any delays to meeting the above requirements to calendar days and issue a modification in accordance with the CONTRACT CLAUSE: DEFAULT.

13.3 The Contractor's schedule must reflect the above anticipated adverse weather delays on all weather dependent activities.

* * * * *

SUBMITTAL REGISTER

(ER 415-1-10)

TITLE AND LOCATION **New River Erosion Control & Esthetic Treatment, Maricopa Cty, Arizona**

CONTRACTOR

CONTRACT NUMBER

NAS ACTIVITY CODE	SUBMITTAL IDENTIFICATION (ITEM NUMBER)	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF SUBMITTAL	TYPE OF SUBMITTAL						ACTION ELEMENT	CONTRACTOR SCHEDULED DATES			CORPS ACTION DATES		REMARKS
				SHOP DRAWING	SAMPLE	GUARANTEE	MFR'S DATA	CERTIFICATE	TEST REPORT		OTHER, AS NOTED	*TECH REVIEW BY	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	
			SPECIAL CLAUSES													
		3.3	Notification of Discrepancies							X						
		4.2	Submittal Register							X						
		7.3	Equipment Cost and Pricing Data							X						
		10.1	Material Safety Data Sheet							X						
			SECTION 1A, GENERAL REQUIREMENTS													
		10.5	Notices							X						
			SECTION 1C, CONTRACTOR'S QUALITY CONTROL													
		2.1	Contractor's Quality Control Plan (CQC)							X						
		2.5	Changes to the CQC Plan							X						
			SECTION 1D, ENVIRONMENTAL PROTECTION													
		3. & 3.2	Environmental Protection Plan							X						
			SECTION 2A, MISCELLANEOUS AGGREGATES													
		2.6	Desert Gravel		X											
		4.	Pea Gravel							X						
		5.	Herbicide Manufacturer's Recommended Rates													

*AE-Architect Engineer

ED-Engineering Division

CD-Construction Division

AREA-Area Engineer

RE-Resident Engineer

SUBMITTAL REGISTER

(ER 415-1-10)

TITLE AND LOCATION **New River Erosion Control & Esthetics Treatment, Maricopa Cty, AZ**

CONTRACTOR

CONTRACT NUMBER

NAS ACTIVITY CODE	SUBMITTAL IDENTIFICATION (ITEM NUMBER)	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF SUBMITTAL	TYPE OF SUBMITTAL						ACTION ELEMENT *TECH REVIEW BY	CONTRACTOR SCHEDULED DATES			CORPS ACTION DATES		REMARKS
				SHOP DRAWING	SAMPLE	GUARANTEE	MFR'S DATA	CERTIFICATE	TEST REPORT		OTHER, AS NOTED	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	SUBMITTED TO CORPS	
		SECTION 2B,	TREES, SHRUBS, AND GROUND COVERS													
		3.1 & 3.2	Top Soil	X					X							
		3.1 & 3.2	Soil Amendments	X					X							
		3.4	Maintenance Instructions							X						
		SECTION 2C,	IRRIGATION SYSTEM													
		11.	Automatic Controller, Enclosure													
			and Components		X		X									
		11.	Backflow Prevention Units		X		X									
		11.	Control Valves		X		X									
		11.	Emitters and Drip Lines		X		X									
		11.	Fertilizers Injector Unit		X		X									
		11.	Flow Sensor		X		X									
		11.	Fliter Units		X		X									
		11.	Flush Valves		X		X									
		11.	Gate Valves		X		X									
		11.	Ball Valves		X		X									
		11.	Pressure Sensor		X		X									
		11.	Pressure Regulator		X		X									

*AE-Architect Engineer

ED-Engineering Division

CD-Construction Division

AREA-Area Engineer

RE-Resident Engineer

SUBMITTAL REGISTER

(ER 415-1-10)

TITLE AND LOCATION **New River Erosion Control & Esthetic Treatment, Maricopa Cty, Arizona**

CONTRACTOR

CONTRACT NUMBER

NAS ACTIVITY CODE	SUBMITTAL IDENTIFICATION (ITEM NUMBER)	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF SUBMITTAL	TYPE OF SUBMITTAL						ACTION ELEMENT	CONTRACTOR SCHEDULED DATES			CORPS ACTION DATES		REMARKS
				SHOP DRAWING	SAMPLE	GUARANTEE	MFR'S DATA	CERTIFICATE	TEST REPORT		OTHER, AS NOTED	*TECH REVIEW BY	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	
		11.	PVC Pipe and Fittings			X	X									
		11.	Quick Coupling Valves and Keys			X	X									
		11.	Water Meters			X	X									
		SECTION 2D, HYDROSEEDING OF NATIVE SEEDS														
		2.1.a	Seed				X									
		2.1.b	Fertilizer				X									
		2.2.a	Hydro-Mulch				X									
		2.2.b	Erosion Control Materials				X									
		SECTION 16A, ELECTRICAL WORK (FOR IRRIGATION SYSTEM)														
		6.	Shop Drawings	X					X							

*AE-Architect Engineer ED-Engineering Division CD-Construction Division AREA-Area Engineer RE-Resident Engineer

T A B L E O F C O N T E N T S

TECHNICAL PROVISIONS

<u>Section</u>	<u>Title</u>
1A	General Requirements
1B	Payment
1C	Contractor's Quality Control
1D	Environmental Protection
2A	Miscellaneous Aggregates
2B	Trees, Shrubs, and Ground Covers
2C	Irrigation System
2D	Hydroseeding of Native Seeds
3A	Concrete
5A	Miscellaneous Metals
16A	Electrical Work (For Irrigation System)

SECTION 1A

GENERAL REQUIREMENTS

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- | | |
|--|--|
| 1. Applicable Publications | 10. Public Utilities, Notices,
and Restrictions |
| 2. Project Facilities | 11. Public Safety |
| 3. Construction Signs | 12. Occupational Safety and Health
Act (OSHA) Standards |
| 4. Project Engineer's Office | 13. Operation and Maintenance
Manuals and Instructions |
| 5. Bulletin Board | 14. Permits |
| 6. Maintenance and Disposal of Project
Facilities | 15. Required Insurance |
| 7. Scrap Materials | 16. Progress Payments |
| 8. Archaeological Findings During
Construction | |
| 9. Layout of 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.).

FF-B-575C	Bolts, Hexagon and Square
FF-N-105B & Am-3 & Int Am-4	Nails, Brads, Staples and Spikes: Wire, Cut and Wrought
FF-N-836D & Am-1	Nut: Square, Hexagon, Cap, Slotted, Castle, Knurled, Welding and Single Ball Seat
MM-L-751H	Lumber; Softwood
TT-E-529D	Enamel, Alkyd, Semi-Gloss
TT-P-25E & Am-2	Primer Coating, Exterior (Undercoat for Wood, Ready-Mixed, White and Tints)

1.2 U.S. Department of Commerce National Bureau of Standards, Product Standard (Prod. Std).

PS 1-83	Construction and Industrial Plywood
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1.3 U.S. Department of the Army Corps of Engineers (CE) Engineer Manual.

EM 385-1-1	Safety and Health Requirements Manual (1 April 1981, Rev 1 October 1987)
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2. PROJECT FACILITIES. The Contractor shall construct and/or erect the following project facilities.

2.1 Construction Signs. The signs shall be erected as soon as possible and within 15 days after commencement of work under this contract.

2.1.1 Five Project Signs at locations designated by the Contracting Officer.

2.1.2 Warning Signs facing approaching traffic on all haul roads crossing under overhead power transmission lines.

2.1.3 Six hard hat signs at locations directed.

2.2 Project Engineer's Office including a fenced parking area.

2.3 Bulletin Board at the Contractor's office.

2.4 Sanitary Facilities.

3. CONSTRUCTION SIGNS.

3.1 Materials.

3.1.1 Lumber shall conform to Fed. Spec. MM-L-751, and shall be seasoned Douglas Fir, S4S, Grade D or better except that posts, braces and spacers shall be construction Grade (WCLB).

3.1.2 Plywood shall conform to Prod. Std. PS 1, grade A-C, Group 1, exterior type.

3.1.3 Bolts, Nuts and Nails. Bolts shall conform to Fed. Spec. FF-B-575, nuts shall conform to Fed. Spec. FF-N-836, and nails shall conform to Fed. Spec. FF-N-105.

3.1.4 Paints and Oils. Paints shall conform to Fed. Spec. TT-P-25 for primer and TT-E-529 for finish paint and lettering.

3.2 Construction.

3.2.1 Project and hard hat signs shall be constructed as detailed in Figures 1, 2, and 3. Decals and safety signs will be furnished by the Contracting Officer.

3.2.2 Warning Signs shall be constructed of plywood not less than 1/2 inch thick and shall be securely bolted to the supports with the bottom of the sign face 3 feet above the ground. The sign face shall be 2 x 4 feet, all letters shall be 4 inches in height, and the wording shall be: "WARNING: OVERHEAD TRANSMISSION LINES".

3.3 Painting. All exposed surfaces and edges of plywood shall be given one coat of linseed oil and be wiped prior to applying primer. All exposed surfaces of signs and supports shall be given one coat of primer and 2 finish coats of white paint. Except as otherwise indicated, lettering on all signs shall be black and sized as indicated.

4. PROJECT ENGINEER'S OFFICE.

4.1 General. The Contractor shall provide a suitable office trailer for the Project Engineer. The exact site will require the Contracting Officer's approval. The trailer shall be adequately heated, well lighted, suitably ventilated, and cooled with an exterior mounted, 1,000 cubic feet per minute

minimum size refrigeration unit, complete, with electrical connections. An adequate supply of cooled drinking water shall be furnished and maintained. Open parking space for 10 vehicles and water and sewer plumbing shall be provided to the office. The combined parking and building area shall be enclosed with a woven wire fence approximately 6 feet high with a 10-foot wide lockable gate accessible from a road or street. The fenced area shall be of sufficient size to permit ease in the parking of vehicles. Power, water, sewer, and telephone connections and services to the Project Engineer's Office shall be installed and paid for by the Contractor.

4.1.1 The Contractor shall provide the following furnishing for the Project Engineer's Office: 20 folding chairs and a reproducing machine. The reproducing machine shall be capable of reducing, enlarging, collating and sorting. The reproducing machine shall include a service and maintenance agreement for the entire period of the contract and shall include all development chemicals. The foregoing furnishings may be new or used provided they are suitable for the intended purpose. The furnishings shall become the property of the Contractor and shall be removed at the completion of the project.

4.2 Office Trailer shall be approximately 12 feet wide by 60 feet in length.

4.3 The Project Engineer's Office shall be available for occupancy within 10 days of the Notice to Proceed and not be removed prior to the completion date of the contract.

5. BULLETIN BOARD. A weatherproof bulletin board, approximately 36 inches wide and 30 inches high, with hinged glass door shall be provided adjacent to or mounted on the Contractor's project office. If adjacent to the office, the bulletin board shall be securely mounted on no less than 2 posts. Bulletin board and posts shall be painted or have other approved factory finish. The bulletin board shall be easily accessible at all times and shall contain wage rates, equal opportunity notice, and such other items required to be posted.

6. MAINTENANCE AND DISPOSAL OF PROJECT FACILITIES. The Contractor shall maintain the project facilities in good condition throughout the life of the project. Upon completion of work under this contract, the facilities covered under this section will remain the property of the Contractor and shall be removed from the site at his expense.

7. SCRAP MATERIAL. Materials indicated to be removed and not indicated to be salvaged, stored or reinstalled are designated as scrap and shall become the property of the Contractor and be removed from the site of work. The Contractor by signing this contract hereby acknowledges that he made due allowance for value, if any, of such scrap in the contract price.

8. ARCHAEOLOGICAL FINDINGS DURING CONSTRUCTION. Should the Contractor or any of his employees in the performance of this contract find or uncover any archaeological remains, he shall notify the Project Engineer immediately. Such notifications will be a brief statement in writing giving the location and nature of the findings. Should the discovery site require archaeological studies resulting in delays and/or additional work, the Contractor will be compensated by an equitable adjustment under the CONTRACT CLAUSES of the contract.

9. LAYOUT OF WORK.

9.1 The Contractor will be given the right-of-way data. The Contractor shall lay out from the right-of-way data the work by establishing all control necessary for construction operations. The Contractor shall furnish, at his own expense, all such stakes, spikes, steel pins, templates, equipment, tools, and materials and all labor as may be required in laying out any part of the work from the right-of-way information furnished by the Government. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other markers established by him until authorized to remove them. The Contracting Officer may require that work be suspended at any time when right-of-way lines are not visible to adequately permit checking the work.

10. PUBLIC UTILITIES, NOTICES, AND RESTRICTIONS.

10.1 General. The approximate location of all railroads, pipe lines, power and communication lines, and other utilities known to exist within the limits of the work are indicated on the drawings. The sizes, locations, and names of owners of such utilities are given from available information, but their accuracy is not guaranteed. Except as otherwise indicated on the drawings, all existing utilities will be left in place and the Contractor shall conduct his operations in such a manner that the utilities will be protected from damage at all times, or arrangements shall be made by the Contractor for their relocation at the Contractor's own expense. The Contractor shall be responsible for any damage to utilities known to exist and shall reimburse the owners for such damage caused by his operations.

10.2 Relocation or Removal. Utilities to be relocated or removed not as part of this contract are designated "To be Relocated by Others" or "To be Removed by Others," respectively. Utilities shown on the plans and not so designated will be left in place and be subject to the provisions of the CONTRACT CLAUSE: PROTECTION OF EXISTING VEGETATION, STRUCTURES, UTILITIES, AND IMPROVEMENTS. The Contractor may make arrangements with the owner for the temporary relocation and restoration of utilities not designated to be relocated, or for additional work in excess of the work needed to relocate utilities designated for relocation at no additional cost to the Government.

10.3 Utilities Not Shown. If the Contractor encounters, within the construction limits of the entire project, utilities not shown on the plans and not visible as of the date of this contract and if such utilities will interfere with construction operations, he shall immediately notify the Contracting Officer in writing to enable a determination by the Contracting Officer as to the necessity for removal or relocation. If such utilities are left in place, removed or relocated, as directed by the Contracting Officer, the Contractor shall be entitled to an equitable adjustment for any additional work or delay.

10.4 Coordination. The Contractor shall consult and cooperate with the owner of utilities that are to be relocated or removed by others to establish a mutual performance schedule and to enable coordination of such work with the construction work. These consultations shall be held as soon as possible after award of the contract or sufficiently in advance of anticipated interference with construction operations to provide required time for the removal or relocation of affected utilities.

10.5 Notices.

10.5.1 Traffic Routing. The Contractor shall notify the Contracting Officer 7 days in advance of the time work will be started in areas requiring the rerouting of traffic, traffic lane striping, and removal of street signs. The foregoing shall apply to progressive modifications of traffic routings within an area in which work is in progress. Additional requirements regarding traffic are included in SECTION: DETOURS AND TRAFFIC CONTROL FACILITIES.

10.5.2 Police, Highway Patrol, and Fire Departments shall be notified by the Contractor whenever a street is to be closed to traffic. If the closing is to be of long duration, a single notification to each department on the last working day before closing will be sufficient. A single notification shall then be made at the time the street is again opened to traffic. If the closing is to be of short duration or if different sections of the street are to be closed at different times, notifications shall be made on a day-to-day basis.

10.5.3 Utilities To be Relocated or Protected. The Contractor shall notify the Contracting Officer, in writing, 14 calendar days prior to starting work on any utility to be relocated or protected. On each relocation, notification shall include dates on which the Contractor plans excavation, by-pass work, removal work and/or installation work, as applicable.

10.5.4 The Contractor shall notify the Contracting Officer, in writing, not less than 14 days in advance of the date on which he will complete trenching, excavation, fill or rough grading, as applicable, at each location where such completed work is required for temporary or permanent relocations by others. The Contractor shall allow a period of 14 calendar days at each relocation, after which time the Contractor may resume his operations.

10.6 Restrictions.

10.6.1 Representatives of Other Agencies. Personnel representing owners and agencies may be present for various portions of the work. However, the Contractor will be responsible only to the Contracting Officer.

10.6.2 During construction, it is anticipated that other Contractors may be working in the area. The Contractor shall be responsible for coordinating his work, as required, to avoid interference with other work in progress.

11. PUBLIC SAFETY. Attention is invited to the CONTRACT CLAUSE: PERMITS AND RESPONSIBILITIES. The Contractor shall provide temporary fencing, barricades, and/or guards, as required, to provide protection in the interest of public safety. Whenever the Contractor's operations create a condition hazardous to the public, he shall furnish at his own expense and without cost to the Government, such flagmen and guards as are necessary to give adequate warning to the public of any dangerous conditions to be encountered and he shall furnish, erect, or maintain such fences, barricades, lights, signs and other devices as are necessary to prevent accidents and avoid damage or injury to the public. Flagmen and guards, while on duty and assigned to give warning and safety devices shall conform to applicable city, county, and state requirements. Should the Contractor appear to be neglectful or negligent in furnishing adequate warning and protection measures, the Contracting Officer may direct attention to the existence of a hazard and the necessary warning and protective measures shall be furnished and

installed by the Contractor without additional cost to the Government. Should the Contracting Officer point out the inadequacy of warning and protective measures, such action of the Contracting Officer shall not relieve the Contractor from any responsibility for public safety or abrogate his obligation to furnish and pay for those devices. The installation of any general illumination shall not relieve the Contractor of his responsibility for furnishing and maintaining any protective facility.

12. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) STANDARDS. The OCCUPATIONAL SAFETY and HEALTH ACT (OSHA) STANDARDS for CONSTRUCTION (Title 29, Code of Federal Regulations Part 1926 as revised from time to time) and the Corps of Engineers General Safety and Health Requirements Manual, EM 385-1-1, are both applicable to this contract. The most stringent requirement of the two standards will be applicable.

13. OPERATION AND MAINTENANCE MANUALS AND INSTRUCTIONS.

13.1 The requirements for furnishing operating and maintenance data/manuals and field instructions under this contract are specified in the Technical Provisions. The Contractor shall submit to the Contracting Officer, not later than 30 calendar days prior to the project completion time, an outline showing the proposed submittal date(s) of operation and maintenance manuals to be furnished to the Government and the scheduled date(s) of all required field instructions to be provided by Contractor furnished personnel or manufacturer's representatives. All operation and maintenance manuals must be furnished to the Contracting Officer not later than 15 calendar days prior to the scheduled dates of any required Contractor furnished field instructions or not later than 30 calendar days prior to project completion if no Contractor furnished field instructions are required.

13.2 Failure on the part of the Contractor to comply with requirements of this clause will result in the Government withholding an estimated amount for obtaining replacement (substituted) manuals from a different source or until all required O&M data/manuals are submitted and accepted.

13.3 All O&M data/manuals submittal data shall be entered in a separate section of the master submittal register.

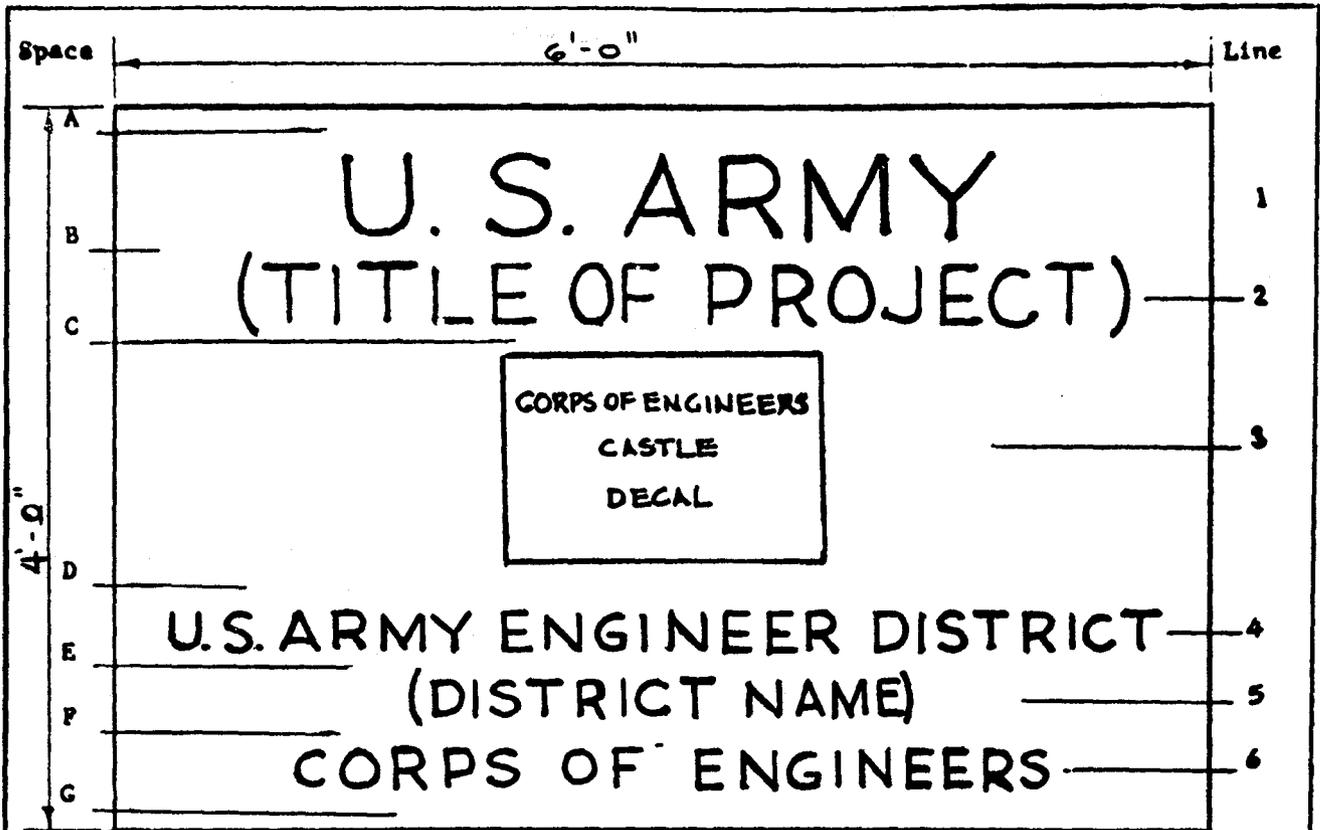
14. PERMITS.

14.1 General. Reference is made to the clause of the contract entitled "Permits and Responsibilities", which obligates the Contractor to obtain all required licenses and permits.

15. REQUIRED INSURANCE. The Contractor shall maintain required insurance for the entire period of the contract. The required insurance shall meet the requirements of the Flood Control District of Maricopa County.

16. PROGRESS PAYMENTS. Reference is made to the clause of the contract entitled "Prompt Payment for Construction Contracts", which obligates the Government to make Invoice payments within a specified period of time. In order to adequately inspect the work and determine the adequacy of the Contractor's performance under the contract, the Government will require 25 calendar days for making such payments in lieu of the 14 days listed in the clause.

* * * * *



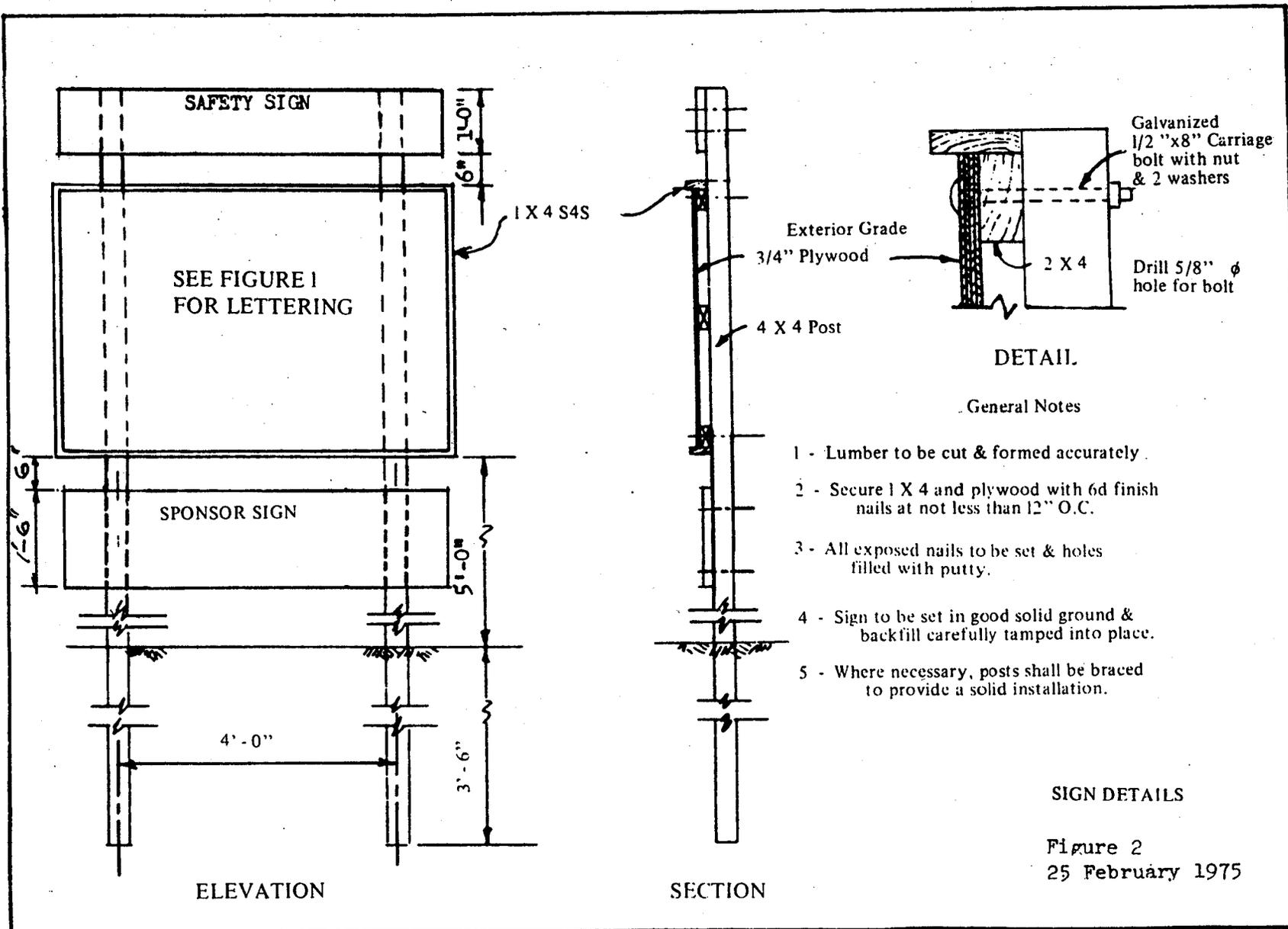
SCHEDULE

<u>Space</u>	<u>Height</u>	<u>Line</u>	<u>Description</u>	<u>Letter Height</u>	<u>Stroke</u>
A	3"	1	U. S. ARMY	5 1/2"	7/8"
B	2"	2	PROJECT NOMENCLATURE	4"	5/8"
C	2"	3	CORPS OF ENGINEERS CASTLE (DECAL)	1 1/4"	--
D	3"	4	U. S. ARMY ENGINEER DISTRICT	2 3/4"	3/8"
E	2"	5	DISTRICT NAME	2 1/4"	1/4"
F	2"	6	CORPS OF ENGINEERS	2 1/2"	3/8"
G	3"				

Lettering Color -- Black

PROJECT SIGN
(Army-Civil Works)

Figure 1
14 August 1972



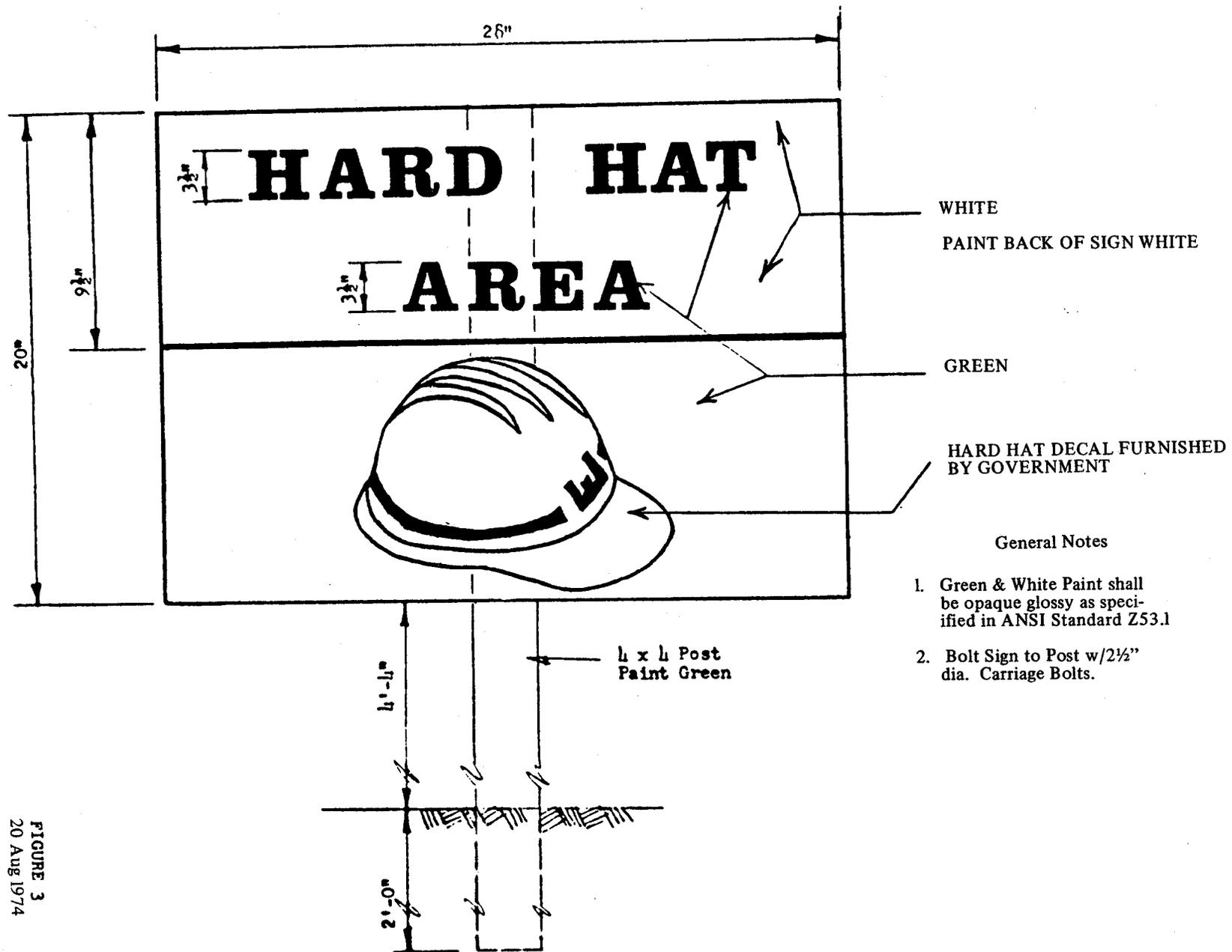


FIGURE 3
20 Aug 1974

SECTION 1B

PAYMENT

1. NEW RIVER EROSION CONTROL AND ESTHETIC TREATMENT. Payment for New River Erosion Control and Esthetic Treatment will be made at the applicable contract lump sum price, which payment shall constitute full compensation for planting of shrubs, trees, hydroseeding, installation of the irrigation system, all appurtenant works and maintenance, complete.

* * * * *

SECTION 1C

CONTRACTOR'S QUALITY CONTROL

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- | | |
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| 1. General | 6. Tests |
| 2. Quality Control Plan | 7. Completion Inspection |
| 3. Quality Control Organization | 8. Documentation |
| 4. Submittals | 9. Notification of Noncompliance |
| 5. Control | |

1. GENERAL. The Contractor shall establish and maintain an effective quality control system in compliance with CONTRACT CLAUSE: INSPECTION OF CONSTRUCTION. The quality control system shall consist of plans, procedures, and organization necessary to provide materials, equipment, workmanship, fabrication, construction and operations which comply with contract requirements. The system shall cover construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence.

2. QUALITY CONTROL PLAN.

2.1 General. The Government will consider an interim plan for the first 15 days of operation. However, the Contractor shall furnish for approval by the Government, not later than 30 days after receipt of Notice to Proceed the Contractor Quality Control (CQC) Plan with which he proposes to implement the requirements of CONTRACT CLAUSE entitled "INSPECTION OF CONSTRUCTION". The plan shall identify personnel, procedures, instructions, records, and forms to be used. If the Contractor fails to submit an acceptable QC plan with the time herein prescribed, the Contracting Officer (CO) may refuse to allow construction to start if an acceptable interim plan is not furnished or withhold funds from progress payments in accordance with the CONTRACT CLAUSE entitled "PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS" until such time as the Contractor submits an acceptable final plan.

2.2 Coordination Meeting. Before start of construction, the Contractor shall meet with the CO and discuss the Contractor's quality control system. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's inspection and control with the Government's inspection. Minutes of the meeting shall be prepared and signed by both the Contractor and the CO. The minutes shall become a part of the contract file. There may also be occasions when subsequent conferences will be called to reconfirm mutual understandings.

2.3 The Quality Control Plan. This plan shall include as a minimum, the following:

2.3.1 A description of the quality control organization including chart showing lines of authority and acknowledgement that the CQC staff shall conduct the phase inspections for all aspects of the work specified and shall report to the project manager or someone higher in the Contractor's organization.

2.3.2 The name, qualifications, duties, responsibilities and authorities of each person assigned a QC functions.

2.3.3 A copy of the letter to the QC manager signed by an authorized official of the firm, which describes the responsibilities and delegates the authorities of the QC manager shall be furnished.

2.3.4 Procedures for scheduling and managing submittals, including those of subcontractors, offsite fabricators, suppliers and purchasing agents.

2.3.5 Control testing procedures for each specific test. (Laboratory facilities will be approved by the Contracting Officer).

2.3.6 Reporting procedures including proposed reporting formats.

2.4 Acceptance of Plan. Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC plan and operations as necessary to obtain the quality specified.

2.5 Notification of Changes. After acceptance of the QC plan, the Contractor shall notify the CO in writing of any proposed change. Proposed changes are subject to acceptance by CO.

3. QUALITY CONTROL ORGANIZATION.

3.1 System Manager. The Contractor shall identify an individual, within his organization at the site of the work, who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. This CQC System Manager shall be approved by the CO.

3.2 Personnel. A staff shall be maintained under the direction of the system manager to perform all QC activities. The actual strength of the staff during any specific work period may vary to cover work phase needs, shifts, and rates of placement. The personnel of this staff shall be fully qualified by experience and technical training to perform their assigned responsibilities and shall be directly hired by and work for the Prime Contractor.

NOTE: Minimum staffing and qualifications may be specified.

4. SUBMITTALS. Submittals shall be as specified in the SPECIAL CLAUSE entitled "SUBMITTALS". The CQC Organization shall be responsible for certifying that all submittals are in compliance with the contract requirements.

5. CONTROL. Contractor Quality Control is the means by which the Contractor assures himself that his construction complies with the requirements of the contract plans and specifications. The controls shall be adequate to cover all construction operations, including both onsite and offsite fabrication, and will be keyed to the proposed construction sequence. The controls shall include at least three phases of inspection for all definitive features of work as follows:

5.1 Preparatory Inspection. This shall be performed prior to beginning any work on any definable feature of work. It shall include a review of contract requirements; a check to assure that all materials and/or equipment have been

tested, submitted and approved; a check to assure that provisions have been made to provide required control testing; examination of the work area to ascertain that all preliminary work has been completed; and a physical examination of materials, equipment and sample work to assure that they conform to approved shop drawings or submittal data and that all materials and/or equipment are on hand. The Contracting Officer Representative (COR) shall be notified at least 24 hours in advance of the preparatory inspection and such inspection shall be made a matter of record in the Contractor's Quality Control documentation as required below. Subsequent to the preparatory inspection and prior to commencement of work, the Contractor shall instruct each applicable worker as to the acceptable level of workmanship required in his CQC plan in order to meet contract specifications.

5.2 Initial Inspection. This shall be performed as soon as a representative portion of the particular feature of work has been accomplished and shall include examination of the quality of workmanship and a review of control testing for compliance with contract requirements, use of defective or damaged materials, omissions, and dimensional requirements. The Contracting Officer's Representative shall be notified at least 24 hours in advance of the initial inspection and such inspection shall be made a matter of record in the CQC documentation as required below.

5.3 Follow-up Inspections. These shall be performed daily to assure continuing compliance with contract requirements, including control testing, until completion of the particular feature of work. Such inspections shall be made a matter of record in the CQC documentation as required below. Final follow up inspections shall be conducted and test deficiencies corrected prior to the addition of new features of work.

6. TESTS.

6.1 Testing Procedure. The Contractor shall perform tests specified or required to verify that control measures are adequate to provide a product which conforms to contract requirements. The Contractor shall procure the services of an industry recognized testing laboratory. A list of tests which the Contractor understands he is to perform shall be furnished as a part of the CQC plan to the Contracting Officer. The list shall give the test name, specification paragraph containing the test requirements, and the personnel and laboratory responsible for each type of test. The Contractor shall perform the following activities and record and provide the following data.

6.1.1 Verify that testing procedures comply with contract requirements.

6.1.2 Verify that facilities and testing equipment are available and comply with testing standards.

6.1.3 Check test instrument calibration data against certified standards.

6.1.4 Verify that recording forms, including all of the test documentation requirements, have been prepared.

6.2 Testing.

6.2.1 Capability Check. The COR will have the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth

in the contract specifications and to check laboratory technician's testing procedures and techniques.

6.2.2 Capability Re-Check. If the selected laboratory fails the capability check, the Contractor will be assessed a charge of \$675.00 to reimburse the Government for each succeeding re-check of the laboratory or the checking of a subsequently-selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

6.2.3 Project Laboratory. The COR will have the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

6.2.4 Transportation of Samples for Testing. Costs incidental to the transportation of samples or materials will be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Corps of Engineers Division Laboratory, f.o.b., at the following address:

For delivery by mail:

Director
South Pacific Division Laboratory
U.S. Army Corps of Engineers
P.O. Box 37
Sausalito, CA 94966

For other deliveries:

Director
South Pacific Division Laboratory
U.S. Army Corps of Engineers
Bridgeway, Foot of Spring St.
(bldg. directly east of 2000 Bridgeway)
Sausalito, CA 94965

7. COMPLETION INSPECTION. At the completion of all work or any increment thereof established by a completion time stated in the paragraph: COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK of the SPECIAL CLAUSES, or stated elsewhere in the specifications, the CQC System Manager shall conduct a completion inspection of the work and develop a punch list of items which do not conform to the approved plans and specifications. Such a list shall be included in the CQC documentation, as required by paragraph: DOCUMENTATION below, and shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or his staff shall make a second completion inspection to ascertain that all deficiencies have been corrected and so notify the Contracting Officer's Representative. The completion inspection and any deficiency corrections required by this paragraph will be accomplished within the time stated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

8. DOCUMENTATION.

8.1 The Contractor shall maintain correct records of quality control operations, activities, and tests performed including the work of suppliers and subcontractors. In addition, these records shall include factual evidence that the required activities or tests have been performed, including but not limited to the following:

8.1.1 Type and number of control activities and tests involved.

8.1.2 Results of control activities or tests, including all computations. Where test results cannot be completed by the time the report is submitted, a notation should be made that the test was performed and the approximate date test results will be available. Delayed test results should be submitted with the report form on the date received.

8.1.3 Nature of defects, causes for rejection, etc.

8.1.4 Proposed remedial action.

8.1.5 Corrective actions taken.

8.2 These records shall cover both conforming and defective or deficient features and shall include a statement that supplies and materials incorporated in the work comply with the contract. Legible copies of these records shall be furnished to the CO daily before 10 a.m.

9. NOTIFICATION OF NONCOMPLIANCE. The Contracting Officer will notify the Contractor of any noncompliance with the foregoing requirements. 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 of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of claim for extension of time or for excess costs or damage by the Contractor.

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SECTION 1D

ENVIRONMENTAL PROTECTION

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| 6. Protection of Environmental Resources | |

1. **SCOPE.** This section covers prevention of environmental pollution and damage as the result of construction operations under this contract and for those measures set forth in other Technical Provisions of these specifications. For the purpose of this specification, environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic, cultural and/or historical purposes. The control of environmental pollution and damage requires consideration of air, water, and land, and includes management of visual aesthetics, noise, solid waste, radiant energy and radioactive materials, as well as other pollutants.

2. **QUALITY CONTROL.** The Contractor shall establish and maintain quality control for environmental protection of all items set forth herein. The Contractor shall record on daily reports any problems in complying with laws, regulations and ordinances and corrective action taken.

3. **SUBMITTALS.** The Contractor shall submit an environmental protection plan in accordance with provisions as herein specified.

3.1 Environmental Protection Plan shall include but not be limited to the following:

(1) A list of Federal, State and local laws, regulations, and permits concerning environmental protection, pollution control and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations and permits.

(2) Methods for protection of features to be preserved within authorized work areas. The Contractor shall prepare a listing of methods to protect resources needing protection, i.e., trees, shrubs, vines, grasses and ground cover, landscape features, air and water quality, soil, historical, archaeological and cultural resources.

(3) Procedures to be implemented to provide the required environmental protection and to comply with the applicable laws and regulations. The Contractor shall set out the procedures to be followed to correct pollution of the environment due to accident, natural causes or failure to follow the procedures set out in accordance with the environmental protection plan.

(4) Permit or license and the location of the solid waste disposal area.

(5) Drawings showing locations of any proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials.

(6) Environmental monitoring plans for the job site, including land, water, air, and noise monitoring.

(7) Traffic control plan.

(8) Methods of protecting surface and groundwater during construction activities.

(9) Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or non-use. Plan should include measures for marking the limits of use areas.

3.2 Implementation. After receipt of Notice to Proceed, the Contractor shall submit in writing the above Environmental Protection Plan within the time specified under SPECIAL CLAUSES. Approval of the Contractor's plan will not relieve the Contractor of his responsibility for adequate and continuing control of pollutants and other environmental protection measures.

4. SUBCONTRACTORS. Assurance of compliance with this section by subcontractors will be the responsibility of the Contractor.

5. NOTIFICATION. The Contracting Officer will notify the Contractor in writing of any observed noncompliance with the aforementioned Federal, State or local laws or regulations, permits and other elements of the Contractor's environmental protection plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of proposed corrective action and take such action as may be approved. If the Contractor fails to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or costs or damages allowed to the Contractor for any such suspension.

6. PROTECTION OF ENVIRONMENTAL RESOURCES. The environmental resources within the project boundaries and those affected outside the limits of permanent work under this Contractor shall be protected during the entire period of this contract. The Contractor shall confine his activities to areas defined by the drawings and specifications. Environmental protection shall be as stated in the following subparagraphs.

6.1 Protection of Land Resources. Prior to the beginning of any construction, the Contractor shall identify all land resources to be preserved within the Contractor's work area. The Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, top soil, and land forms without special permission from the Contracting Officer. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Where such special emergency use is permitted, the Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs.

6.1.1 Work Area Limits. Prior to any construction the Contractor shall mark the areas that are not required to accomplish all work to be performed under this contract. Isolated areas within the general work area which are to be saved and

protected shall also be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, the markers shall be visible. The Contractor shall convey to his personnel the purpose of marking and/or protection of all necessary objects.

6.1.2 Protection of Landscape. Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques.

6.1.3 Reduction of Exposure of Unprotected Erodible Soils. Earthwork brought to final grade shall be finished as indicated and specified. Side slopes and back slopes shall be protected as soon as practicable upon completion of rough grading. All earthwork shall be planned and conducted to minimize the duration of exposure of unprotected soils. Except in instances where the constructed feature obscures borrow areas, quarries and waste material areas, these areas shall not initially be cleared in total. Clearing of such areas shall progress in reasonably sized increments as needed to use the areas developed as approved by the Contracting Officer.

6.1.4 Temporary Protection of Disturbed Areas. Such methods as necessary shall be utilized to effectively prevent erosion and control sedimentation, including but not limited to the following:

6.1.4.1 Retardation and Control of Runoff. Runoff from the construction site shall be controlled by construction of diversion ditches, benches, and berms to retard and divert runoff to protected drainage courses, and any measures required by area-wide plans approved under paragraph 208 of the Clean Water Act.

6.1.5 Erosion and Sedimentation Control Devices. The Contractor shall construct or install all temporary and permanent erosion and sedimentation control features as necessary. Temporary erosion and sediment control measures such as berms, dikes, drains, sedimentation basins, grassing and mulching shall be maintained until permanent drainage and erosion control facilities are completed and operative.

6.1.6 Location of Field Offices, Storage and Other Contractor Facilities. The Contractors' field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated and/or shown on the drawings. Temporary movement or relocation of Contractor facilities shall be made only on approval by the Contracting Officer.

6.1.7 Spoil Areas shall be managed and controlled to limit spoil to areas designated and prevent erosion of soil from entering nearby water courses or lakes.

6.1.8 Temporary Excavations and Embankments for plant and/or work areas shall be controlled to protect adjacent areas from dispoilment.

6.1.9 Disposal of Solid Wastes. Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. All handling and disposal shall be conducted to prevent contamination.

6.1.10 Disposal of Chemical Waste. Chemical waste shall be stored in corrosion resistant containers, removed from the work area and disposed of in accordance with Federal, State and local regulations.

6.1.11 Disposal of Discarded Materials. Discarded materials other than those which can be included in the solid waste category will be handled as directed by the Contracting Officer.

6.2 Preservation and Recovery of Historical, Archaeological and Cultural Resources. Existing historical, archaeological and cultural resources within the Contractor's work area will be so designated by the Contracting Officer and precautions taken to preserve all such resources as they existed at the time they were pointed out to the Contractor. The Contractor shall install all protection for these resources so designated on the drawings and shall be responsible for their preservation during this contract. If during construction activities the Contractor observes unusual items that might have historical or archaeological value, such observations shall be reported as soon as practicable to the Contracting Officer. Recording and preservation of historical and archaeological finds during construction activities are specified in SPECIAL CLAUSES.

6.3 Protection of Water Resources. The Contractor shall keep construction activities under surveillance, management and control to avoid pollution of surface and groundwaters. Special management techniques as set out below shall be implemented to control water pollution by the listed construction activities which are included in this contract.

6.3.1 Washing and Curing Water. Waste waters directly derived from construction activities shall not be allowed to enter water areas. These waste waters shall be collected and placed in retention ponds where suspended material can be settled out or the water evaporates so that pollutants are separated from the water.

6.3.2 Cofferdam and Diversion Operations. The Contractor shall plan his operation and perform all work necessary to minimize adverse impact or violation of the water quality standard of Federal, State, or local Governments. Construction operations for dewatering, removal of cofferdams, shall be controlled at all times to limit the impact of water turbidity on the habitat for wildlife and impacts on water quality for downstream use.

6.3.3 Monitoring of Water Areas Affected by Construction Activities shall be the responsibility of the Contractor. All water areas affected by construction activities shall be monitored by the Contractor.

6.4 Protection of Air Resources. The Contractor shall keep construction activities under surveillance, management and control to minimize pollution of air resources. All activities, equipment, processes, and work operated or performed by the Contractor in accomplishing the specified construction shall be in strict accordance with the State of Arizona and all Federal emission and performance laws and standards. Ambient Air Quality Standards set by the Environmental Protection Agency shall be maintained for those construction operations and activities specified in this section. Special management techniques as set out below shall be implemented to control air pollution by the construction activities which are included in the contract.

6.4.1 Particulates. Dust particles, aerosols, and gaseous by-products from all construction activities, processing and preparation of materials, such as from asphaltic batch plants, shall be controlled at all times, including weekends, holidays and hours when work is not in progress. A permit will be required by Maricopa County "Bureau of Air Pollution Control" that will require particulate suppression control.

6.4.1.1 Particulates Control. The Contractor shall maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, and all other work areas within or outside the project boundaries free from particulates which would cause the air pollution standards mentioned in paragraph: Protection of Air Resources, above to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated at such intervals as to keep the disturbed area damp at all times. The Contractor must have sufficient competent equipment available to accomplish this task. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs.

6.4.2 Hydrocarbons and Carbon Monoxide. Hydrocarbons and carbon monoxide emissions from equipment shall be controlled to Federal and State allowable limits at all times.

6.4.3 Odors. Odors shall be controlled at all times for all construction activities, processing and preparation of materials.

6.4.4 Monitoring of Air Quality shall be the responsibility of the Contractor. All air areas affected by the construction activities shall be monitored by the Contractor.

6.5 Protection of Sound Intrusions. The Contractor shall keep construction activities under surveillance, and control to minimize damage to the environment by noise. The Contractor shall use methods and devices to control noise emitted by equipment to the levels shown.

7. POST CONSTRUCTION CLEANUP. The Contractor shall cleanup and remove all excess material from the areas used for construction at the Contractor's expense.

8. RESTORATION OF LANDSCAPE DAMAGE. The Contractor shall restore all landscape features damaged or destroyed during construction operations outside the limits of the approved work areas. Such restoration shall be in accordance with the plan submitted for approval by the Contracting Officer. This work will be accomplished at the Contractor's expense.

9. MAINTENANCE OF POLLUTION CONTROL FACILITIES. The Contractor shall maintain all constructed facilities and portable pollution control devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

10. TRAINING OF CONTRACTOR PERSONNEL IN POLLUTION CONTROL. The Contractor shall train his personnel in all phases of environmental protection. The training shall include methods of detecting and avoiding pollution, familiarization with

pollution standards, both statutory and contractual, and installation and care of facilities (vegetative covers, and instruments required for monitoring purposes) to ensure adequate and continuous environmental pollution control.

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SECTION 2A

MISCELLANEOUS AGGREGATES

1. APPLICABLE PUBLICATIONS. The following American Society of Testing and Materials (ASTM) 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.

C 33-82	Concrete Aggregates
C 117-84	Materials Finer than 75µm (No. 200) Sieve and Mineral Aggregates by Washing
C 131-81	Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
C 136-84	Sieve or Screen Analysis of Fine and Coarse Aggregates
C 144-81	Aggregate for Masonry Mortar

1.2 Uniform Standard Specifications for Public Works Construction, Maricopa Association of Governments.

2. DESERT GRAVEL. Desert Gravel shall be placed on the areas as shown on the drawings. The Contractor shall certify that all materials supplied will conform to project specifications. The Desert Gravel shall be placed in accordance with the following requirements.

2.1 Desert Gravel (D.G.) shall be any granitoid igneous rock which has been weathered in place and which has as principal constituents granular fragments of quartz and feldspar. It may also contain fragments of granite rock not yet broken down into the component minerals. The material shall remain stable when saturated with water.

2.2 Material shall be free from all foreign objects, lumps, irregularities and shall be consistent in color.

2.3 Desert Gravel shall have a maximum size of not more than 1/2 inch, not more than 35 nor more than 50 percent passing the No. 4 sieve, not more than 10 percent of the material passing the No. 200 sieve, and shall have a plasticity index of less than 10 for the material passing the No. 40 sieve when tested in accordance with ASTM C 136 and ASTM C 117.

2.4 Coloration shall conform to the "Munsell" soil chart (1975 edition; published by the Knoll Morgen Corp., 2441 North Calvert Street, Baltimore, Maryland 21218). Hue 7.5 YR, value/chroma 6/4.

2.5 Material shall be obtained from commercial sources.

2.6 Contractor shall submit color samples (minimum of 3) and gradations of D.G. to the Contracting Officer or his representative for approval prior to installation.

2.7 D.G. shall be spread to a depth of 2 inches thick, raked, dampened, and rolled with a 90# roller.

3. LANDSCAPE MOUNDING. Fill material for use in landscape mounding shall be representative of existing site soil and be free of all foreign material, caliche, and all organic material and stones larger than 2 inches in diameter. The source of landscape fill shall be the Contractor's responsibility. The landscape fill shall be subject to approval by the Contracting Officer.

4. PEA GRAVEL. Aggregate for "pea gravel" material shall be of clean sand, gravel or crushed rock and shall be free from lumps or balls of clay and shall not contain calcareous or clay coatings, caliche, synthetic materials, organic matter of foreign substances. The gradation shall meet the following requirements:

<u>Sieve Size</u>	<u>Percent Passing</u>
3/8 inch	100
No. 4	0-20
No. 8	0-5
No. 200	0-2.0

5. HERBICIDE. Areas to be covered with desert gravel shall be treated with Dacthol or approved equal pre-emergent herbicide. The pre-emergent herbicide shall be applied at the maximum manufacturer's recommended rates for pre-emergent herbicides. The subgrade shall be thoroughly compacted and the areas shall be weed free prior to application of pre-emergent herbicide. The pre-emergent herbicide shall be applied to the ground in a slurry mix through a 50 mesh screen avoiding contact with existing plant materials. The pre-emergent herbicide shall be applied in two (2) applications, prior to and immediately follow installation of desert gravel.

6. AGGREGATE BASE. Aggregate base material shall be crushed aggregate conforming to the requirements of Maricopa Association of Governments specifications Section 702.

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SECTION 2B

TREES, SHRUBS, AND GROUND COVERS

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| 6. Materials | |

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 Specification (Fed. Spec.).

O-F-241D

Fertilizers, Mixed Commercial

1.2 American National Standards Institute (ANSI) Publication.

Z60.1-1986

American Standard for Nursery Stock

1.3 American Joint Committee on Horticultural Nomenclature (AJCHN) Publication.

Standardized Plant Names
(Second Edition, 1942)

1.4 American Society for Testing and Materials (ASTM) Standard.

C 136-84a

Sieve Analysis of Fine and Coarse
Aggregates

2. SOURCE INSPECTIONS.

2.1 Plant Materials. Plant materials will be inspected by the Contracting Officer at the growing site and tagged or otherwise approved for delivery. Such inspection does not preclude right of rejection at the project site.

2.2 Topsoil. The source of topsoil will be inspected by the Contracting Officer to determine the acceptability of the topsoil.

3. SUBMITTALS.

3.1 Samples. The following samples shall be submitted for approval before work is started.

a. Topsoil. Representative samples shall be taken from several locations on the area under consideration.

b. Soil Amendments. Ten pounds of each type to be used in the project.

3.2 Certified Laboratory Test Reports. Testing shall be performed by an approved independent laboratory within 10 days of submittal of reports. Test reports on a previously tested material shall be accompanied by certificates from the manufacturer certifying that the material is equal in all respects to that proposed for this project. Certified copies of the reports of tests listed below shall be submitted:

a. Offsite topsoil - for pH, salts, potash, and phosphorous.

b. Organic Amendments - for classification of total nitrogen, moisture ash and organic matter, sand content, pH.

3.3 Certificates of Conformance or Compliance. Before delivery, notarized certificates attesting that the following materials meet the requirements specified, shall be submitted for approval and in accordance with SPECIAL CLAUSES.

a. Plant materials.

b. Fertilizers.

c. Herbicide.

d. Pesticides.

e. Soil conditioners.

f. Top soil.

3.4 Maintenance Instruction. Written instructions for year-round care of installed plants shall be furnished.

3.5 Identification. All plants shall be identified with durable waterproof labels and weather-resistant ink. Labels shall be securely attached to plants, bundles, or containers of plants and shall state the correct plant name and size.

4. DELIVERY, STORAGE, AND HANDLING.

4.1 Delivery.

4.1.1 The Contractor shall notify the Contracting Officer of the delivery schedule in advance so the plant material may be inspected upon arrival at the jobsite by the Contracting Officer. Unacceptable plant material shall be removed from the jobsite immediately.

4.1.2 Plants shall be protected during delivery to prevent damage to the root balls or desiccation of leaves. Trees shall be protected during transportation by tying in the branches and covering all exposed branches.

4.1.3 Fertilizer shall be delivered to the site in the original, unopened containers bearing the manufacturer's guaranteed chemical analysis, name, trade name or trademark, and in conformance to state and Federal law. In lieu of containers, fertilizer may be furnished in bulk and a certificate indicating the above information shall accompany each delivery.

4.1.4 All pesticide material, including soil fumigants, shall be delivered to the site in the original unopened containers. Containers that do not have a legible label that identifies the Environmental Protection Agency registration number and the manufacturer's registered uses will be rejected.

4.1.5 Soil conditioners and amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's guaranteed chemical analysis and name. In lieu of containers, soil conditioners and amendments may be furnished in bulk and a certificate from the manufacturer indicating the above information shall accompany each delivery.

4.2 Storage.

4.2.1 Plant Storage. Plants not installed on the day of arrival at the site shall be stored and protected. Outside storage locations shall be continually shaded and protected from the wind. Plants stored on the project shall be protected from any drying at all times. Plants in containers, shall be kept in a moist condition until planted by routine watering.

4.2.2 Storage of Other Materials. Pesticide material shall be kept in dry storage and shall not contaminate adjacent material, and shall be handled and stored following manufacturer's directions. Storage of materials shall be in areas designated or as approved by the Contracting Officer. The Contractor shall take all necessary steps to insure that the plants are maintained in a healthy growing condition.

4.3 Handling. Care shall be taken to avoid damaging plants being moved from the nursery or storage area to the planting site. Plants shall be protected from freezing or drying out by covering with burlap, tarpaulin or mulching material during transportation to planting site. Plants shall not be handled by the trunk or stems. Damaged plants will be rejected and shall be removed from the site.

5. ENVIRONMENTAL PROTECTION. All work and Contractor operations shall comply with the requirements of SECTION: ENVIRONMENTAL PROTECTION.

6. MATERIALS.

6.1 Plants.

6.1.1 Plants shall conform to the varieties specified in the plant list and be true to botanical names as listed in AJCHN Standardized Plant Names. Plants shall be in accordance with ANSI Z60.1 except as otherwise stated in the specifications or shown on the plans. Where the drawings or specifications are in conflict with ANSI Z60.1, the drawings and specifications shall prevail.

6.1.2 Planting stock shall be well-branched and well-formed, sound, vigorous, healthy, and free from disease, sun-scald, windburn, abrasion, and harmful insects or insect eggs and shall have healthy, normal and unbroken root systems. Deciduous trees and shrubs shall be symmetrically developed, of uniform habit of growth, and free from objectionable disfigurements. Plants shall have been grown under climatic conditions similar to those in the locality of the project.

6.1.3 The minimum acceptable sizes of all plants, measured before pruning and with branches in normal position, shall conform to the measurements indicated. Plants larger in size than specified may be used with the approval of the

Contracting Officer with no change in the contract price. If larger plants are used, the ball of earth or spread of roots shall be increased in accordance with ANSI Z60.1.

6.1.4 The Contractor shall facilitate inspection and identifications by labeling trees or containers of the same shrub, with a durable waterproof label and weather-resistant ink. Labels shall state the correct plant name and size as specified in the list of required plants. Labels shall be securely attached to plants and shall be legible for the duration of the plant establishment period.

6.1.5 Plant material shall be nursery grown unless otherwise indicated and shall conform to the requirements and recommendations of ANSI Z60.1. Plants shall be prepared for shipment in a manner that will not cause damage to branches, shape, and future development after planting.

6.1.5.1 Container grown plants shall have sufficient root growth to hold the earth intact when removed from containers but shall not be root bound. Container shall be free from noxious weeds.

6.1.6 Substitutions shall be made only when a plant (or its alternates as specified) is not obtainable and the Contracting Officer authorizes a change order providing for use of the nearest equivalent obtainable size or variety of plant having the same essential characteristics with an equitable adjustment of the contract price.

6.2 Topsoil.

6.2.1 Topsoil shall be the existing soil excavated from plant pits and screened to remove rocks larger than one inch. The soil shall be free from nut grass, refuse, heavy clay, noxious weeds, material toxic to plant growth or any rocks larger than one inch.

6.2.2 Additional topsoil, if required, beyond that available from excavating plant pits shall be a natural, friable soil similar to soils at the site. It shall be obtained from well-drained areas and shall be free of any admixture of subsoil, foreign matter, objects larger than one inch in any dimension, toxic substances, and any material or substances that may be harmful to plant growth. The pH range shall be 7.0 to 7.5. Topsoil that does not meet this pH range shall be amended by the addition of pH adjusters, at a rate recommended by the County Extension Service agent, based on soil tests.

6.3 Soil Conditioners and Amendments.

6.3.1 Rotted sawdust shall have 7.5 pounds of nitrogen added uniformly to each cubic yard and shall be free of chips, stones, sticks, soil, and toxic substances.

6.3.2 Planting Soil Mixture. The planting soil mixture shall be composed of six parts topsoil, and four parts rotted sawdust, two parts iron sulphate per cubic yard of mix and fertilizer tablets at the manufacturer's recommended rate.

6.4 Fertilizer. Fertilizer shall be commercial grade and uniform in composition.

6.4.1 Tablet form of slow release fertilizers shall be used conforming to Fed. Spec. O-F-241 with IBDU (isobutylidene-diurea), and shall bear the manufacturer's guaranteed statement of analysis. Slow release fertilizers shall

contain a minimum percentage by weight of: 14 nitrogen, 3 percent available phosphoric acid, and 3 percent potash.

6.5 Mulch. Mulch shall be 2 inches of Desert Gravel (except in areas to be hydroseeded) free from deleterious materials and shall be stored so as to prevent inclusion of foreign materials.

6.6 Staking Material.

6.6.1 Stakes for support shall be lodge pole pine, free from knots, rot, cross grain, or other defects that would impair the strength. Standard stakes shall be treated with pentachlorophenol, and 2-1/2 inches in diameter by 8 feet long and pointed at one end shall be used. Ground stakes shall be a minimum of 2 inches by 2 inches and 3 feet long and pointed at one end.

6.6.2 Tie wire shall be 12 gauge annealed galvanized steel.

6.6.3 Hose chafing guards shall be new 2-ply reinforced rubber or plastic hose and shall be all the same color on the project. Length shall be one and one-half times the circumference of the plant at its base.

6.7 Water. Water shall not contain elements toxic to plant life.

7. SITE PREPARATION.

7.1 Clearing and Grading. Clearing shall consist of the satisfactory removal and disposal of brush, weeds, snags, and rubbish occurring within the landscape area shown or as directed by the Contracting Officer. Clearing shall be accomplished by hand within 5 feet of existing vegetation to be left standing. Grading shall conform to the lines and grades shown.

7.2 Layout. Plant material locations and bed outlines shall be staked on the project site before any plant pits or beds are dug. Plant material locations may be adjusted by the Contracting Officer to meet field conditions.

7.3 Protection of Existing Vegetation. If lawns have been established prior to planting operations, the surrounding turf shall be covered before excavations are made in a manner that will protect turf areas. Existing trees, shrubbery, and beds that are to be preserved shall be barricaded in a manner that will effectively protect them during planting operations.

7.4 Underground Obstructions to Planting. If underground utilities, construction, or solid rock ledges are encountered, other locations for planting may be selected by the Contracting Officer.

7.5 Plant Pits. Plant pits shall be dug to produce vertical sides and flat, uncompacted bottoms. When pits are dug with an auger and the sides of the pits become glazed, the glazed surface shall be scarified. The size of plant pits shall be as shown on drawings.

7.6 Herbicide and Pesticide Application. Herbicides, insecticides and fungicides shall be applied as needed and in accordance with the manufacturer's recommendations.

8. INSTALLATION.

8.1 Planting Seasons and Conditions. Planting shall not be done when the ground is in an unsuitable condition for planting as determined by the Contracting Officer.

8.2 Container grown stock shall be removed from containers in such a way so as to prevent damage to plant or root system. Planting shall be completed as specified above.

8.2.1 Container stock shall be backfilled with topsoil to approximately half the depth of the ball and then tamped and watered. The remainder of backfill of topsoil shall be tamped and watered. Earth saucers or water basins shall then be formed around isolated plants. Water holding basins shall be ample enough in size and height to hold at least 2-1/2 gallons for shrubs or 5 gallons for trees.

8.3 Watering. Depressed water basins shall be used around all plants. All watering shall be done in a manner which will provide deep penetration, but which will not cause erosion or damage to the finished surface. Sufficient water shall be applied to penetrate the planting bed to a depth of 24 inches. Frequent watering may be necessary during periods of hot weather.

8.4 Inspection. The trunks of the trees shall be inspected for physical damage or insect infestation and required treatment or rejection shall be determined.

9. PRUNING.

9.1 New plant material shall be pruned in the following manner. Dead and broken branches shall be removed. Trees and shrubs shall be pruned to reduce total amount of anticipated foliage by one fourth. Typical growth habit of individual plants shall be retained with as much height and spread as is practicable. Cuts shall be made with sharp instruments, and shall be flush with trunk or adjacent branch to insure elimination of stubs. "Headback" cuts at right angles to line of growth shall not be permitted. Trees shall not be poled or the leader removed. Trimmings shall be removed from the site. Cuts 1/2 inch in diameter and larger shall be painted with the specified tree wound dressing.

9.2 Restoration and Clean-Up. Excess and waste material shall be removed daily. When planting in an area has been completed, they shall be cleared of all debris, spoil piles, and containers.

9.3 Maintenance During Installation. Maintenance operations shall begin immediately after each plant is planted and shall continue as required until final acceptance. Plants shall be kept in a healthy, growing condition by watering, pruning, spraying, weeding, and any other necessary operations of maintenance. Plant saucers and beds shall be kept free of weeds, grass, and other undesired vegetation. Plants shall be inspected at least once per week by the Contractor during the installation period and needed maintenance performed promptly.

10. PLANT ESTABLISHMENT PERIOD. Final acceptance of all work and materials under this section shall be at the end of a period of establishment to be determined as follows.

10.1 Beginning of the Plant Establishment Period. The period of establishment shall begin on the date that an inspection by the Contracting Officer shows that all plants are in place and have been installed in accordance with the specifications and plans.

10.2 During the Plant Establishment Period.

10.2.1 During the plant establishment period, the Contractor shall water all plants as necessary to maintain an adequate supply of moisture within the root zone. Water shall not be applied so quickly that it cannot be absorbed by the plants. The Contractor shall pay for water and electricity during the plant establishment period.

10.2.2 Plants shall be pruned as specified.

10.2.3 Stakes, wire enclosures, and eroded plant saucers including the entire area within the wire enclosure shall be replaced as required.

10.2.4 Other work, such as spraying with approved insecticides and fungicides to control pests, shall be done (each day if necessary) to ensure plant survival in a healthy growing condition.

10.2.5 Dead plants shall be removed immediately at the Contractor's expense and replaced within seven (7) days. The Contractor will be responsible for theft or damage to plants by vehicles or vandalism until final project completion, approval, and acceptance of the planting contract.

10.3 Termination of the Plant Establishment Period.

10.3.1 A preliminary inspection by the Contractor and the Contracting Officer will be held 120 days from the date of the beginning of the plant establishment period to determine plant acceptability and the number of replacements. Alternate or substituted varieties of plants shall be used only if approved by the Contracting Officer.

10.3.2 A final inspection of all plants will be held after the replacement planting has been completed. No additional plant establishment period will be required for replacement plants. The establishment period will end on the date of this inspection and said inspection will be considered final acceptance provided the Contractor has complied with the following requirements.

a. Dead, missing, and defective plant material shall have been replaced as directed by the Contracting Officer otherwise, final acceptance will be delayed until such replacements have been satisfactorily accomplished.

b. Plant saucers and the entire area within the wire enclosure shall be free of weeds.

c. Stakes and guys shall be in good condition.

d. Remedial measures directed by the Contracting Officer to ensure plant survival shall have been carried out.

e. Plant material shall have been fertilized as required prior to acceptance.

11. MAINTAINING EXISTING TREES.

11.1 Existing trees which fall within the right-of-way, and which have been designated for saving, shall be protected and maintained during the life of the contract as directed by the Contracting Officer.

11.2 Maintenance operations shall begin immediately after the Contractor has begun work and shall continue until as required until final acceptance. Plants shall be kept in a healthy, growing condition by watering, pruning, spraying, weeding, and any other necessary operations of maintenance.

11.3 Pruning shall be accomplished in the following manner. Dead and broken branches shall be removed. Trees shall be pruned to reduce total anticipated foliage by one fourth. Typical growth habits of individual plants shall be retained with as much height and spread as is practicable. Cuts shall be made with sharp instruments, and shall be flush with trunk or adjacent branch to insure elimination of stubs. "Headback" cuts at right angles to line of growth shall not be permitted. Trimmings shall be removed from the site. Cuts 1/2 inch in diameter and larger shall be painted with the specified tree wound dressing.

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SECTION 2C

IRRIGATION SYSTEM

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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 Specification (Fed. Spec.).

WW-U-531F	Unions, Pipe, Steel or Malleable Iron, Threaded Connection, 150 lbs and 250 lbs and 300 lbs WSD
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WW-V-51F	Valve, Angle, Check, and Globe, Bronze, (125, 150 and 200 Pound, Threaded End, Flanged Ends, Solder Ends, and Brazed Ends, for Land Use)
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WW-V-54D & Int. Am-3	Valve, Gate, Bronze (125, 150 and 200 Pound, Threaded Ends, Flange Ends, Solder End and Brazed Ends, for Land Use)
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1.2 American National Standards Institute, Inc. (ANSI).

B16.3-1977	Malleable Iron Threaded Fittings Classes 150 and 300
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B16.26-1983	Cast Copper Alloy Fittings for Flares Copper Tubes
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1.3 American Society for Testing and Materials (ASTM) Standards.

A 120-84	Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary Uses
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B 88-86	Seamless Copper Water Tube
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D 1556-82	Density of Soil In-Place by the Sand-Cone Method
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D 1557-78	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using a 10-lb. (4.45 kg) Rammer and 18-In. (457 mm) Drop
D 1785-86	Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
D 2216	Laboratory Determination of Water (Moisture) Content of Soil, Rock and Soil-Aggregate Mixture
D 2241-87	Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
D 2464-76	Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
D 2466-78	Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
D 2564-80	Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings

1.4 American Water Works Association (AWWA) Standards.

C 651-86	Disinfecting Water Mains
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1.5 Maricopa Association of Government (M.A.G.).

Specifications 530 and 790

1.6 Manufacturers Standardization Society of the Valve and Fittings Industry Inc. (MSS) Standards.

SP-58	Pipe Hangers and Supports-Materials, Design and Manufacture (1983)
SP-69	Pipe Hangers and Supports-Selection and Application (1983)

2. GENERAL. This section covers irrigation piping including connection to source of water supply, complete.

2.1 Above ground piping shall be copper tubing or as shown on the drawings.

2.2 Below Ground Piping. Pipe below ground shall be plastic. Pipe for sleeving shall be corrugated metal, galvanized steel or plastic. The minimum cover for laterals shall be 12 inches and 4 inches for drip line, unless otherwise indicated on drawings. The minimum cover for pressure lines shall be 2.5 feet except under roadways, parking and paved areas where the minimum cover shall be 3 feet. The electric wire conduit may be placed above the main line in the same trench. All other irrigation lines and wire shall be placed as shown on the drawings.

2.3 Electrical Work from power source to automatic controllers shall conform to the applicable requirements of SECTION: ELECTRICAL WORK (FOR IRRIGATION LANDSCAPING).

2.3.1 Where restrictive areas (Limited Construction R/W) occurs, lateral lines, main lines, and conduits shall be placed in the same trench as directed by the Contracting Officer.

3. EXCAVATION.

3.1 General. All excavation of every description and of whatever substances encountered shall be performed to the depths indicated or as otherwise specified. During excavation, material conforming to the requirements of paragraph: PIPE BEDDING AND BACKFILL MATERIALS shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. All excavated materials not required or suitable for backfill shall be removed and wasted as indicated or as directed. Grading shall be done as may be necessary to prevent surface water from flowing into trenches or other excavations, and any water accumulating therein shall be removed by pumping or by other approved methods.

3.2 Trench Excavation. Trench excavation shall follow, as much as possible, the layout indicated on drawing. Trenches shall be of the necessary width for proper laying of pipe. The banks of pipe trenches shall be as nearly vertical as practicable. Care shall be taken not to overexcavate. The bottom of the trenches shall be accurately graded to provide uniform bearing and support for each section of the pipe on undisturbed soil at every point along entire length, except for the portions of the pipe sections where it is necessary to excavate for the proper sealing of pipe joints, and as hereinafter specified. Except as hereinafter specified for wet or otherwise unstable material, overdepth excavation shall be backfilled as and with materials specified for backfilling the lower portion of trenches. Whenever wet or otherwise unstable material that is incapable of properly supporting the pipe is encountered in the bottom of the trench, and overdepth is not indicated on the drawings, such material shall be overexcavated to a depth to allow for construction of a stable pipe bedding. The trench shall be backfilled to the proper grade with approved materials.

3.3 Jobsite Conditions.

3.3.1 Protection of Property. The Contractor shall be responsible for the preservation and protection of all trees, plants, monuments, structures and paved areas from damage due to this work. In the event damage does occur, all damage to inanimate items shall be completely repaired or replaced to the satisfaction of the Contracting Officer, and all injury to living plants shall be repaired by the Owner or such person as he may employ to accomplish this work. All the costs of such work shall be charged to and paid by the Contractor. Open ditches left exposed shall be flared and barricaded by the Contractor. Damage caused by the Contractor to asphalt, concrete or other building material surfaces shall be repaired or replaced by the Contractor at his expense. Contractor shall restore disturbed areas to original condition.

3.3.2 Existing and New Plantings. All trenching or other work under this limb spread of any and all evergreens or low branching deciduous material shall be done by hand or by other methods so that no limbs or branches are damaged in any way.

Where it is necessary to excavate adjacent to existing trees, use all possible care to avoid injury to trees and tree roots. Excavation, in areas where 2 inch and larger roots occur, shall be done by hand. Roots 2 inch or larger in diameter, except directly in the path of pipe or conduit, shall be tunneled under and shall be heavily wrapped with burlap to prevent scarring or excessive drying. Where a trenching machine is operated close to trees having roots smaller than 2 inches in diameter, the wall of the trench adjacent to the tree shall be hand trimmed making clean cuts through roots. One inch and larger in diameter roots shall be painted with two coats of "tree seal" or accepted equivalent. Trenches adjacent to trees should be closed within 24 hours, and where this is not possible, the side of the trench adjacent to the tree shall be kept shaded with wetted burlap or canvas.

3.3.3 Protection and Repair of Underground Lines. The Contractor shall be responsible for requesting the proper utility company to stake the exact location of any underground electric, gas and telephone lines. The Contractor shall take whatever precautions are necessary to protect underground lines from damage, and in the event damage does occur, all damage shall be repaired by the Owner or such persons as he may employ to accomplish this work. All costs of such work shall be paid by the Contractor unless other arrangements have been made.

4. BACKFILLING. The trenches shall not be backfilled until all required pressure tests are performed and until the irrigation systems as installed conform to the requirements specified. Material for backfill shall conform to the requirements of paragraph: PIPE BEDDING AND BACKFILL MATERIALS. After the main irrigation system has been installed, tested, and approved, backfill material shall be placed in the trench in 4-inch lifts and compacted with mechanical tampers or vibrators. After 12-inches of fill has been placed the electrical work shall then be installed. A 6-inch lift of backfill placed over the electrical work and compacted with mechanical tampers or vibrators. The lateral lines shall be installed and backfill placed in trench and compacted to 90 percent of maximum density with mechanical tampers or vibrators to match lines and grades. When no lateral lines are to be installed, backfill shall be placed in maximum 12-inch lifts and compacted to 90 percent of maximum density as determined in accordance with ASTM D 1557, with mechanical tampers or vibrators to match lines and grades.

4.1 Control. Moisture-density relations shall be established by the Contractor. Field density tests shall be performed by the Contractor in sufficient number and in such locations to insure that the specified density is being obtained. Moisture-density relations and field densities shall be reported on approved forms. One copy of density data less dry weight determinations shall be provided on the day each test is taken. The complete test reports shall be provided with the Contractor Quality Control Report on the work day following the test.

4.1.1 Laboratory Control. One moisture-density relation shall be made for each classification, blend, or change in classification of the soil material encountered. Approval of moisture-density relations shall be obtained prior to the compacting of any material in the work. The moisture-density relations shall be determined in a laboratory in accordance with ASTM D 1557 (modified as specified herein after.)

4.1.1.1 A separate batch of materials will be used for each compaction test specimen. No material will be reused.

4.1.1.2 The desired amount of mixing water will be added for each compaction test specimen, mixed well, and the mixture will be placed in a container with an airtight cover and allowed to cure for 24 hours. A shorter curing time may be allowed where tests show that shortening the curing time will not affect the results.

4.1.2 Field Control. Field in-place density shall be determined in accordance with ASTM D 1556 and Field Moisture Content shall be determined in accordance with ASTM D 2216. The density tests shall be well distributed and shall average not less than one for each 500 feet of trench.

5. MATERIALS. All main line and (pressure) main line fittings shall be minimum 200 psi working pressure. Materials shall conform to the respective specifications and other requirements specified below.

5.1 Pipe.

5.1.1 Galvanized Steel Pipe shall conform to ASTM A 120, standard weight.

5.1.2 Copper Tubing. ASTM B 88, Type K, annealed.

5.1.3 Plastic Pipe shall conform to ASTM D 1785, schedule 40 for pipe with solvent welded joints and schedule 80 for pipe with threaded joints, or to ASTM D 2241, Type 1, grade 1, 315 psi for pressure lines and 200 psi for other lines for pipe with solvent welded joints. Pipe and fittings shall bear the seal of approval (nsf mark) of the National Sanitation Foundation's standard for plastic pipe and fittings for potable water service. Plastic pipe stored on the construction site shall be protected from sunlight and from dirt entering pipe.

5.1.4 Polyethylene pipe shall be 100 percent polyethylene as follows:

1/2" I.D. .574" wall thickness .050"

Melting point - .065 grams per 10 minutes

Plastic Recovery - 30%

Tensile strength at break - 1665 pounds per square inch

Elongation - 65%

Brittleness at 76°C - zero failures from 10 samples

Stress crack in 100% Igepol solution - zero failures from 10 samples

5.1.5 Polyethylene pipe (drip line) shall have a maximum length of 250 feet in the areas containing ground covers, shrubs, and trees. Drip lines located in areas containing only shrubs and trees shall have a maximum length of 400 feet, including drip lines rings around shrubs and trees. Maximum flow (gpm) shall not exceed the manufacturer's recommendations for pipe size indicated.

5.2 Joints.

5.2.1 Plastic Pipe Joints shall be solvent welded or threaded. Solvent for welded joints shall conform to ASTM D 2564. Use of pipe dope or solvents on threaded joints will not be permitted. Polyethylene shall have compression joints.

5.2.2 Copper Tubing. Joints shall be compression-pattern flared and shall be made with fittings hereinafter specified.

5.2.3 Flanges shall conform to AWWA C207, and shall be used only in above ground installations or where shown on the drawings or when approved.

5.3 Fittings and Specials.

5.3.1 For Galvanized Steel Pipe. Steel fittings shall be galvanized. Threaded fittings shall conform to ANSI B 16.3.

5.3.2 For Plastic Pipe. Fittings shall conform to ASTM D 2464 or D 2466.

5.3.3 For Copper Tubing. Fittings and specials shall be flared and conform to ANSI B16.26.

5.4 Gate Valves shall be designed for a working pressure of not less than 200 psi. Valve connections shall be as required for the piping in which they are installed. Valves shall have a clear waterway equal to the full nominal diameter of the valve, and shall be opened by turning counterclockwise. The operating nut or wheel shall have an arrow, cast in the metal, indicating the direction of the opening.

5.4.1 Valves shall be all bronze and shall conform to Fed. Spec. WW-V-54, Type I.

5.5 Backflow Prevention Units.

5.5.1 General. Backflow prevention units of the types indicated shall be installed at the locations shown on the drawings. Where union connections are not provided as part of the unit, the Contractor shall provide and install a union or sleeve type coupling between the control valve and the inlet side of the unit. Pipe and fittings for backflow prevention units shall be galvanized steel.

5.5.2 Reduced Pressure Backflow Prevention Unit. The reduced pressure backflow prevention unit shall be a factory assembled unit consisting of two independently acting spring-loaded check valves with a differential pressure relief valve controlled-reduced-pressure zone in between and shall be complete with test cocks and drain. The first check valve shall reduce the supply pressure a predetermined amount so that during normal flow and the cessation of normal flow the pressure between the checks is less than the supply pressure. The pressure differential relief valve shall automatically discharge to atmosphere to maintain the pressure in the reduced pressure zone below the supply pressure. All parts shall be removeable or replaceable without removal of the unit from the line. The unit shall be suitable for a working pressure of 125 pounds per square inch and shall be the product of a manufacturer regularly engaged in the production of backflow prevention units of the reduced pressure type.

5.6 Emitters (Drip Line). Emitter shall be independent pressure compensating plastic in-line emitters, (Drip Line) capable of providing consistent discharge rate of 0.5 gallon per hour (gph) for ground covers and shrubs, one gallon per hour (gph) for trees at 3 to 60 pounds per square inch (psi). The emitter shall be constructed of heat resistant plastic and have an operating range of 3 to 60 pounds per square inch. Emitters shall be spaced as shown on plans.

5.7 Valve Boxes shall be plastic or concrete except that concrete boxes may be installed only in locations not subjected to vehicular traffic. Concrete boxes shall be the standard product of manufacturer of precast concrete equipment. The

words "Irrigate", for gate valves; and "RCV" for remote control valves shall be cast in covers of boxes for the irrigation system. Plastic boxes shall be a standard catalog product of a manufacturer regularly engaged in the manufacture of valve boxes. Valve boxes shall have locking or boltable covers. Plastic shall be rigid combination of polyolefin and fibrous inorganic materials having the following physical properties:

<u>ASTM Test</u>	<u>Method</u>	<u>Value</u>
Tensile Strength (2.0 in. Min.)	D-638	3,400 psi
Impact Strength, Izod	D-256	0.5 ft-lb/in
Shore-D Hardness	D-2240	63
Deflection Temp. @ 66 psi stress	D-648	230 degrees F
Specific Gravity	D-792	1.15

5.7.1 Install one valve box for each type of valve installed as per details. No valve box extensions will be accepted. Gravel sump shall be installed after compaction of all trenches. Final portion of gravel shall be placed inside valve box after valve box is backfilled and compacted. Controller letter and station number are to be branded on the lid of each valve box. Letter and number size to be no smaller than one inch and no greater in size than 1-1/2 inch, depth of branding to be no more than 1/8 inch and no less than 1/16 inch into valve box lid. Splice boxes shall be labeled with the words "low voltage electrical splice" in the same manner.

5.8 Remote Control Valves and Valve Accessories.

5.8.1 The remote control valves shall be an electrical actuated valve constructed of corrosion-resistant materials. The valve shall have an internal manual operation which allows the opening and closing of the valve without electrical power, or external bleed of water. The valve shall have a self-cleaning screen and a removable housing cover for easy inline maintenance.

Materials: body - glass reinforced nylon.
 diaphragm - reinforced nylon with O-ring and stainless steel pressure plate.
 spring - stainless steel.

Performance: 1" valve - min. 2 gpm max. 50 gpm
 (FLOW RATES) 1-1/2" valve - min. 10 gpm max. 110 gpm
 2" valve - min. 25 gpm max. 200 gpm

5.8.2 The solenoid actuator shall be 24 volt A.C. 2-way type. Inrush and holding current shall be no more than 300 mA and 200 mA respectively. The solenoid shall require approximately 1/3 the inrush current as standard 24 volt A.C. solenoids.

Materials: Plunger and core - stainless steel.
 housing - glass reinforced nylon, epoxy potted.
 spring - stainless steel

Performance: min. operating voltage at 150 psi shall be 20 volts.
 Inrush Current (amps) .104
 Holding Current (amps) .104

5.8.3 Automatic Controllers. Connections to items in the field unit enclosure are as follows: Drip valves are to be connected to field unit through output terminals in the order shown on the plans. Pressure control to be wired to one of the fourteen input terminals on field unit. Motorized ball valve to be wired to two of the fourteen input terminals. One for opening the valve and one for closing the valve. Total of two valves and four input terminals per point of connection. Rain gauge to be connected to one of the fourteen input terminals or the field unit. Flow meter is to be connected to the flow monitor which is connected to one of the fourteen back indication on the field unit. Radio interface to be connected to field unit in enclosure and antenna mounted outside of enclosure or as detailed on the project drawings. All wiring above grade to be installed in fiberglass reinforced epoxy electrical conduit and as per local code.

5.9 Tipping Bucket Rain Gauge shall be a high quality accurate instrument used for measuring participation. Rainfall shall enter a 12 inch funnel collector and be directed to the tipping bucket assembly. The bucket shall be made of stainless steel. The funnel shall be anodized aluminum and have two screens to prevent debris from entering the gate. A level shall be provided on the base for correct positioning of unit. The rain gauge shall come with 0/04 inch calibration. The Contractor shall install the unit according to the manufacturers requirements and as shown on the drawings. Contract Rating: 3 watts, 28 VAC, 0.25 amps, 120 VAC.

5.10 Fertilizer Injector shall be a feeder, water operated, positive displacement proportioning chemical metering pump. The pump shall come with plastic tubing, foot valve strainer, suction valve and discharge valve. The pump minimum operating pressure shall be 15 psi and the maximum operating pressure shall be 125 psi. The fertilizer injector shall have a chemical to water ratio of 1:760 maximum. The fertilizer injector shall have the following options:

- Diaphragm - Hypalon
- Head - PVC
- Valve - Double
- Single Head Fittings - Universal Injector

The Contractor shall install the fertilizer injector according to the manufacturers requirements and as shown on the drawings.

5.11 Irrigation Filter (main line) shall be a centrifugal action filter which forces incoming water through a directional nozzle plate onto the inside of the filter screen. Debris is forced down in rotating motion into a holding basin at the bottom of the filter and by opening a flush valve the particles may be removed. The Contractor shall install the irrigation filter according to the manufacturers requirements and as shown on the drawings.

5.11.1 Filter Housing shall be constructed of ten gauge steel, epoxy coated, and welded into a wye configuration. A threaded 1/4 inch pressure tap shall be welded into the upstream and downstream piping for connection of pressure gauges.

5.11.2 Filter Screen shall be 150/mesh stainless steel.

5.11.3 Filter Flush Valve shall be a "ball" type made of brass.

5.12 Irrigation Filter (lateral line) shall be a wye type filter with an 150/mesh screen or smaller. The filter shall be constructed of brass, threaded at both ends and come with a "ball" type flush valve connection.

5.13 Pressure Regulator shall be constructed of brass with double unions (or as shown on the drawings). The pressure regulator shall have integral pressure adjustments and an integral pressure gauge. The pressure regulator shall be installed according to the manufacturer's requirements and as shown on the drawings.

5.14 Automatic Irrigation Controller shall be a computer-controlled field satellite system capable of radio communication with a remote (off site) central computer. The irrigation controller shall be a multiwired, stand-alone microprocessor base capable of performing up to eight independent irrigation functions simultaneously. The controller shall be connected by communication cable to the transmitter/receiver unit as shown on the drawings. The minimum station capacity shall be as indicated on the drawings. The irrigation controller shall be mounted in a metal enclosure as specified, detailed and as shown on the drawings.

5.15 Automatic Irrigation Controller Components shall be compatible with the irrigation controller and shall be installed according to manufacturer's requirements and as shown on the drawings.

5.15.1 Digital Flow Monitor shall be a microprocessor based flow monitor with LCD which will display the flow rate and total flow rate at the push of a button. The flow monitor shall be capable of being calibrated in the field with the use of a front mounted keyboard.

5.15.2 Conduit Box Kit shall be a weatherproof enclosure for stand-alone mounting and shall meet NEMA 4x. An opening shall be provided for a standard 1/2 inch conduit fitting. Mounting brackets shall be welded to the aluminum enclosure allowing surface mounting to the irrigation enclosure.

5.15.3 Keyboard Security Kit shall prevent unauthorized or accidental resetting of total accumulated flow, pipe diameter calibration and pulse output calibration. Special security fasteners and spanner shall be provided.

5.15.4 Relay Output Kit shall provide SPDT relay. The relay shall be available in 12 VDC or 24 VDC coil voltages. The voltage requirement shall be as shown on the project drawings.

5.15.5 AC Power Adapter (transformer) shall be UL approved 120 VAC outlet plug-in power supply to provide 12 VDC to the flow monitor.

5.15.6 Field Satellite Tranceiver shall be a trunked radio and be of the same manufacturer as the irrigation controller used in the project. The radio shall be provided with a microprocessor control, audible status tones, and system privacy for efficient communication on a channel sharing the same trunked radio system. The radio shall be equipped with a durable 5dB gain performance antenna and be of the same manufacturer as the radio. The trunked radio and the antenna shall be installed according to the manufacturer's recommendation and as shown on the drawings.

5.16 Flow Sensor (meter) shall be a 6-bladed design with a proprietary non-magnetic sensing mechanism. The sensor shall be supplied with a two conductor, shielded cable extending out through a conduit connection on top of the sensor. The sensor shall be mounted in a threaded brass pipe tee. The flow

sensor shall have a maximum pressure range of 200 psi and flow range of 30-1 feet/second. The Contractor shall install the flow sensor according to the manufacturer's requirements and as shown on the project drawings.

5.17 Quick Coupling Valves shall be two piece, spring-loaded, compression type, normally closed, opening against line pressure, and actuated by downward thrust against the valve. Body shall be of heavy duty brass construction. Machined parts shall be fabricated from red brass. Valve washers and sealers for key stems shall be of a semi-rigid, non-metallic, material and shall be easily replaceable. Inlets shall be tapped for National Standard pipe thread of the pipe riser size or sizes shown on the drawings. Valves shall be suitable for a maximum operating pressure of 125 psi and shall be the standard product of a reputable manufacturer of quick coupling valves for lawn sprinkling systems. The hinged cover shall be constructed of non-corrosive material and shall be lockable. The Contractor shall furnish coupler keys and hose swivels for operating the valves (total of six).

5.18 Vent (air) Valve/Vacuum Breaker shall be for use on an irrigation piping system that will allow air to purge up to 125 psi during the fill process and allow air to enter during drain-down. The valve shall be installed in accordance with manufacturer's written instructions in a 10-inch diameter valve box with boltable cover. A 1/2 inch air vent shall be installed on the high point of each lateral line serving drip irrigation systems.

Valve materials - Thermoplastic body, glass filled Polysuflone

Temperature - Max. operating temperature:
200 degrees F. under pressure
250 degrees F. unpressurized

Pressures - Max. operating pressure 100 psi
proof pressure 150 psi, minimum

5.19 Gravel shall be pea gravel in accordance with SECTION: MISCELLANEOUS AGGREGATES.

5.20 Pipe Bedding and Backfill Materials. The bottom of trenches shall be accurately graded to provide uniform bearing and support for each section of pipe on undisturbed soil at every point along its entire length. Backfill material shall be screened to remove any stone larger than one inch and may consist of sand, gravelly sands and silty sands. Organic material, trash, debris, clayey sands, silt, sandy silt, clay, sandy clay, broken concrete or pavement and other objectionable material shall not be used.

5.21 Pipe straps shall conform to the applicable requirements of MSS SP 58 and SP 69.

5.22 Motorized Ball Valve. The electric actuator and the ball valve shall be of the same manufacturer. The motorized ball valve shall have manufacturer supplied micro switches for position indication. Position indications shall be wired to back indication of irrigation controller. The ball valve shall have the following options:

Body, Pipe Ends - Brass
Ball Stem - 316 S.S.
Seat - TFE
Body Seal - TFE
Ends - Screwed Pipe Ends

The Contractor shall install the motorized ball valve according to the manufacturer's requirements and as shown on the project drawings.

5.22.1 Electric actuator shall be compatible with the irrigation controller. The actuator shall have multi-function capabilities. The housing shall be NEMA IV watertight. Gearing shall be two stage planetary gear, permanently lubricated self locking train. The electrical actuator shall have the following options:

Torque in./lbs. - 600
Voltage VAC - 115
Duty Cycles - 100%
90 degree/Time Seconds - 23
Locked Rotor Current (Amps) 115 VAC - .46
Options - 2 additional micro-switches
Travel Stops - Stops for 90 degree operation

5.22.2 Ball Valve shall be of three piece construction for easy installation and inline maintenance. The ball valve shall be a two-way ball valve designed to seal on the downstream side against a resilient seat.

5.23 Enclosure Box Irrigation Controller shall be a NEMA 4, 12 gauge steel, all welded enclosure 36" (W) x 18" (D) x 48" (H) in height, having a full-gasketed hinged door, 3-point dead bolt latch mechanism, padlockable handle, and integral mounting racks compatible with specified controller, power supply and ancillary equipment. The preferred box is manufactured by Cross Brothers, Inc. and is known as a La Max Enclosure, specifically the "Arizona Box" which has additional louvers.

5.24 Pressure Sensor (switch) shall be operated by a brass Bourdon tube actuating a mercury switch and inclosed in a weather-resistant housing. Switch shall have deadband adjustable operating range from 5-150 psig. Switch shall have calibrated dial and two pointers indicating set and reset points. Switch shall have visible on/off indication. Set points shall be adjustable without removing switch cover or shutting down process. The pressure sensor shall be enclosed in a NEMA type enclosure, and shall be lockable, size as required. The Contractor shall install the pressure sensor according to the manufacturer's requirements and as shown on the project drawings.

5.25 Self flushing end valves with concrete or plastic boxes with locking lids, shall be provided at dead ends of all lateral lines and drip line runs of drip system. Each drip line run shall be capable of delivering a minimum of 17 GPH to the flushing valve.

6. INSTALLATION.

6.1 General. Unless otherwise specified, installation of emitters, backflow prevention units, control valves, meters and valve boxes shall conform to the standard details shown on drawing.

6.2 Handling. Pipe and accessories shall be handled so as to insure delivery to the trench in sound, undamaged condition. The interior of pipe and accessories shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved method. Before installation, the pipe shall be inspected for defects. Material found to be defective before or after laying shall be replaced with sound material at no additional cost to the Government.

6.3 Cutting of pipe shall be done in a neat and workmanlike manner without damage to the pipe. Unless otherwise recommended by the manufacturer and authorized by the Contracting Officer, cutting shall be done with an approved type mechanical cutter. Wheel cutters shall be used when practicable.

6.3.1 Plastic Pipe shall be cut square and all burrs, particles and curls shall be removed prior to jointing.

6.4 Placing and Laying. Pipe, drip line, and accessories shall be carefully lowered in to the trench. Under no circumstances shall any of the materials be dropped or dumped into the trench. The full length of each section of pipe or drip line shall rest solidly upon the pipe or drip line bed, with recesses excavated to accommodate joints. Pipe or drip line that has the grade or joint disturbed after laying shall be taken up and relaid. Pipe or drip line shall not be laid in water or when trench conditions are unsuitable for the work. Water shall be kept out of the trench until jointing is completed. When work is not in progress or left unattended, open ends of pipe, drip line, fitting, and valves shall be securely closed (water tight) so that no trench water, earth, or other substance will enter the system. Drip lines shall not be placed with kinks or sharp bends, that section of drip line shall be replaced at the direction of the Contracting Officer.

6.4.1 Plastic Pipe shall be installed in accordance with the procedures recommended in ASTM D 2774 and as herein specified.

6.4.2 Tracer wire or tracer tape shall follow the main line pipe lines and terminate in the valve box with the gate valve that controls these main irrigation lines. Provide enough length of wire or tape to make a loop and attach a plastic label with the designation "Tracer Wire".

6.5 Jointing.

6.5.1 Galvanized Steel Pipe. Threaded joints shall be made tight with a stiff mixture of graphite and oil, inert filler and oil, or with an approved graphite compound, applied with a brush to the male threads only. Compounds shall not contain lead.

6.5.2 Connections between different types of pipe and accessories shall be made with transition fittings approved by the Contracting Officer. PVC to metal connections shall utilize teflon tape.

6.6 Pipe and Conduit Sleeves shall be installed with a minimum of off-set at the joints to permit easy installation and removal of the irrigation and conduit lines. All plastic lines shall be installed in sleeves under paved areas, spillways, and other structures. Sleeves shall extend at least 12 inches beyond the edges of the pavement or structure. Sizes of sleeves shall be as follows:

<u>Pipe Size (inches)</u>	<u>Minimum Sleeve Size (inches)</u>
1/2	2
3/4	2-1/2
1, 1-1/4 and 1-1/2	3
2 and 2-1/2	4

<u>Number of Wires</u>	<u>Minimum Conduit Size (inches)</u>
1 to 10	1
1 to 27	2

6.7 Setting of Valves, and Boxes. Valves and valve boxes shall be installed where shown or directed, and shall be set plumb. Valve boxes shall be centered on the valves. Valves shall be located outside the area of roads and streets. Earthfill shall be carefully tamped around each valve or meter 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. When valve boxes are grouped together, allow at least 12 inches between boxes.

6.8 Reaction Backing.

6.8.1 Thrust blocks shall be concrete mixed not leaner than one cement: 2-1/2 sand: 5 gravel. Blocks shall be placed between solid ground and the fitting to be anchored. The area of bearing shall be as indicated on the drawings or as approved.

6.9 Remote Control Valves.

6.9.1 Install remote control valves in locations as shown on the drawings. Fit with plastic or concrete valve box and boltable over. Top of valve box shall be 1/2 inch above finish grade.

6.10 Wire for Remote Control Valves. For wiring connections from remote control valve assemblies (RCV) to irrigation controller panel using type THWN/THHN dual rated wire. Wiring shall be installed in rigid PVC conduit, Class 125. Pullboxes and junction boxes will be located every 200 feet or 90 degree change in pipe direction and will be clearly marked as appropriate. All wiring connections shall be waterproofed using components such as 3M DBY Splice Kit (Scotchlock Y Electrical Spring Connector) or Rain Bird ST-03 Snap-Tite, UL Connectors and PT-S5 Sealer or as shown on the drawings.

6.10.1 Electrical wiring for remote control valves. Electrical wiring from controller to control valves shall be as shown on drawings. The electrical wiring shall be solid, single conductor, copper wire, type UF, size recommended by the Controller Manufacturer except the minimum wire size shall be No. 10. Common wire shall be different color from all others and be minimum wire size of No. 10. Regardless of the number of location of valves connected to a single controller station, separate control wires shall be run from the controller station to each valve. Wiring from controllers to panel shall be installed in rigid conduit.

6.11 Automatic Controller. Controller shall be mounted on embed. Connect electrical panel as shown on the drawings. Connection to control wiring shall be made within the pedestal or head of the controller. Electrical wiring shall be in a rigid conduit from controllers to panel as shown on the drawings and provided under SECTION: ELECTRICAL WORK. The work under this section shall include all wiring to the panels or elsewhere as required, in order to complete the installation of the control system.

6.12 Connection to Existing Water Lines. The Contractor shall make all necessary arrangements as specified in SECTION: GENERAL REQUIREMENTS. Water meters and taps by the City of Peoria (COP), water mains shall be provided and installed by the Contractor. Costs shall be paid by the Contractor. The Contractor shall install metal vault as per COP specifications. POC: Peoria Water Department, COP (602) 979-3830.

6.13 Connection to Existing Electrical Lines. The Contractor shall make all necessary arrangements as specified in SECTION: GENERAL REQUIREMENTS for electrical service connections. Costs of installation and connections shall be paid by the Contractor. P.O.C. Arizona Public Services, Metro Engineering Service, 2121 West Cheryl Drive, Phoenix, AZ 85036, Mr. Ernest Cota, (602) 271-3576 and Flood Control District of Maricopa County, 3335 West Durango Street, Phoenix, AZ 85009, Mr. R. W. Shobe, (602) 269-4603.

6.14 Bridge Crossing. Main line and electrical bridge crossing shown on the project drawings to be executed as follows:

Secure piping to bridge with pipe straps and anchor bolts 24 inches O.C. Hang piping across bridge with unistrut pipe hangers anchor bolted to underside at 24 inches O.C. Piping to be schedule 40 galvanized steel from connection into PVC main line across bridge to connection back into PVC main line. Wire conduit to be galvanized steel electrical conduit. Piping and conduit to be hung a minimum 6 inches from bridge deck edge.

7. TESTS.

7.1 After completion of the piping system and prior to backfilling and the installation of the sprinklers and emitters (drip line), the entire system shall be tested for leaks and thoroughly flushed under pressure for a minimum of 5 minutes to remove any dirt, scale or other material. Lines shall be tested at 120 psi for a minimum of 2 hours duration. Cracked or defective pipe, fittings, or accessories disclosed in the pressure tests shall be replaced by the Contractor with sound material at no additional cost to the Government, and the test shall be repeated until results are satisfactory to the Contracting Officer. Before acceptance, the pressure line must remain pressurized for a period of 48 hours.

7.1.1 No line shall be covered until inspection and approval has been given by the Contracting Officer.

7.1.2 Testing of plastic pipe shall not be done until all joints have had at least 24 hours to set and cure. During cold weather, 48 hours elapsed time shall be allowed for setting prior to testing. No water under pressure shall come in contact with any joint during the specified curing period. In hot weather, water shall not be permitted to stand in pipes until after backfilling is completed. Water used in testing shall be drained from pipes after completion of testing.

7.2 Coverage Test. When the emitters (drip line) system is completed the entire system shall be adjusted and operated to demonstrate the water coverage is complete and adequate and that the system conforms to the manufacturer's requirements and according to the plans and specifications. All deficiencies and inadequacies resulting from defective or inadequate materials and/or workmanship shall be corrected at no additional cost to the Government. In the event any modifications to the system or deviation from the approved plans and specifications are directed, an adjustment in contract price will be made.

8. DISINFECTION. The completed line from the backflow prevention unit to the connection to the existing waterline shall be disinfected as prescribed by AWWA C 601.

9. CLEANUP. Upon completion of the installation of the irrigation system and appurtenances, all debris and surplus materials resulting from the work shall be removed.

10. VARIATION IN ARRANGEMENT OF IRRIGATION EQUIPMENT from those shown on drawings will be permitted. If such variation is made, the Contractor shall submit a shop drawing for approval in accordance with the SPECIAL CLAUSES. If any conflicts occur necessitating departures from the contract drawings, details of departures, hydraulic calculation and reasons shall be submitted as soon as practicable for written approval of the Contracting Officer. Hydraulic calculations shall include application rate per hour, maximum triangular spacing of sprinkler and layout for emitters (drip line) for design flow rate and pressure, overlap including wind loss allowance and friction loss through pipe fittings, valves and accessories.

11. SUBMITTALS AND GUARANTEE. The manufacturer's literature on the following materials and equipment to be furnished under this specification shall be submitted for approval with a guarantee for a period of one year from the date of acceptance thereof, either for beneficial use or final acceptance, whichever is earlier, against defective materials, design, and workmanship:

- Automatic controller, enclosure and any other components listed herein and on the project drawings
- Backflow prevention units
- Control valves
- Emitters and drip line
- Fertilizer injector unit
- Flow sensor
- Filter units
- Flush valves
- Gate valves
- Ball valves (Electrical Actuators)
- Pressure sensor
- Pressure regulator
- PVC pipe and fittings
- Quick coupling valves and keys
- Water meters

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SECTION 2D

HYDROSEEDING OF NATIVE SEEDS

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- | | |
|------------------------------------|-----------------------------|
| 1. Applicable Publications | 4. Environmental Protection |
| 2. Submittals | 5. Materials |
| 3. Delivery, Storage, and Handling | 6. Installation |

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 Specification (Fed. Spec.).

O-F-241D

Fertilizers, Mixed, Commercial

1.2 U.S. Department of Agriculture (USDA) Agricultural Marketing Service, Seed Branch, Grain Division.

53 Stat. 1275

Federal Seed Act (Approved
August 9, 1939, Reprinted Sept 1975;
Amendment May 1976 Sept 1977)

2. SUBMITTALS.

2.1 Certificates of Conformance or Compliance. Before delivery, notarized certificates attesting that the following materials meet the requirements specified, shall be submitted in triplicate for approval:

- a. Seed.
- b. Fertilizer.

2.2 Manufacturer's Literature. Manufacturer's literature on the following materials shall be submitted:

- a. Hydro-Mulch.
- b. Erosion Control Materials.

2.3 Maintenance Instructions. Prior to end of the contract maintenance period, 3 copies of written instructions for year-round maintenance and care of installed hydroseeded area shall be furnished to the Contracting Officer.

3. DELIVERY, STORAGE, AND HANDLING.

3.1 Delivery.

3.1.1 The Contractor shall notify the Contracting Officer of the delivery schedule in advance so material may be inspected upon arrival at the jobsite. Unacceptable material shall be removed from the jobsite immediately.

3.1.2 During delivery seed shall be protected from drying out and contamination.

3.1.3 Fertilizer shall be delivered to the site in the original, unopened containers bearing the manufacturer's guaranteed chemical analysis, name, trade name, trade mark, and conformance to state and Federal laws. In lieu of containers, fertilizer may be furnished in bulk and a certificate indicating the above information shall accompany each delivery.

3.2 Storage.

3.2.1 Seed and fertilizer shall be kept in dry storage away from contaminants.

3.2.2 Storage of materials shall be in areas designated or as approved.

4. ENVIRONMENTAL PROTECTION. All work and Contractor operations shall comply with the requirements of SECTION: ENVIRONMENTAL PROTECTION.

5. MATERIALS.

5.1 Seed. Seed shall be state-certified seed of the latest season's crop and shall be delivered in original sealed packages bearing the producer's guaranteed analysis for percentages of mixtures, pure live seed, germination weedseed content, and inert material. Seed shall be labeled in conformance with U.S. Department of Agriculture rules and regulations under the Federal Seed Act and applicable state seed laws. Seed that has become wet, moldy, or otherwise damaged will not be acceptable. Onsite seed mixing shall be done only in the presence of the Contracting Officer. Seed mixture shall be proportioned by the pounds of pure live seed (PLS) per acre as follows:

<u>Botanical Name</u>	<u>Common Name</u>	<u>Pure Live Seed</u>
A. <i>Atriplex polycarpa</i>	Desert Saltbush	2.0 Lbs/Acre
B. <i>Cenchrus ciliaris</i>	Buffelgrass	2.5 Lbs/Acre
C. <i>Schismus barbatus</i>	Mediterranean Grass	2.5 Lbs/Acre
D. <i>Encelia farinosa</i>	Brittle Bush	2.0 Lbs/Acre
E. <i>Encelia frutescens</i>	Green Brittlebush	1.5 Lbs/Acre
F. <i>Ambrosia dumosa</i>	White Bursage	2.0 Lbs/Acre
G. <i>Ambrosia deltoides</i>	Triangleleaf Bursage	2.0 Lbs/Acre
H. <i>Plantago insularis</i>	Wooly Indian Wheat	2.5 Lbs/Acre
I. <i>Haplopappus linearifolius</i>	Golden Weed	1.5 Lbs/Acre
H. <i>acradenii</i> (substitution)		
	Total PLS	18.5 Lbs/Acre

Maximum weed seed shall not exceed one percent by weight.

5.2 Fertilizer shall be commercial grade, free flowing, uniform in composition and shall conform to applicable state and Federal regulations. Granular fertilizer shall conform to Fed. Spec. O-F-241, Type I, Level B, and shall bear the manufacturer's guaranteed statement of analysis. Granular inorganic fertilizer shall contain a minimum percentage by weight equaling 16 nitrogen (of which 50 percent shall be organic), 8 available phosphoric acid and 4 potash. Granular slow release fertilizer shall contain a minimum percentage by weight equaling 16 nitrogen, 6 available phosphoric acid, and 8 potash.

5.3 Mulch.

5.3.1 Wood cellulose fiber for use with hydraulic application of seed and fertilizer shall consist of specially prepared wood cellulose fiber, processed to contain no growth or germination-inhibiting factors and dyed an appropriate color to facilitate visual metering of the application of materials. On an air-dry weight basis, the wood cellulose fiber shall contain a maximum of 12 percent moisture, plus or minus 3 percent at the time of manufacture. The pH range shall be from 3.5 to 5.0. The wood cellulose fiber shall be manufactured so that:

a. After addition and agitation in slurry tanks with fertilizers, seeds, water, and other approved additives, the fibers in the material will become uniformly suspended to form a homogeneous slurry.

b. When hydraulically sprayed on the ground, the material will form a blotterlike cover impregnated uniformly with seed.

c. The cover will allow the absorption of moisture and allow rainfall or applied water to percolate to the underlying soil.

5.4 Water. Water shall contain no elements toxic to plant life. Water necessary for the maintenance of hydroseeded area shall be obtained by the Contractor and shall be adequate for the intended purpose.

5.5 Erosion Control Material shall be a totally organic substance supplied in dry, powdered form, at least 70 percent of which is 92 percent pure muciloid, derived from *Plantago ovata-insularis* husk. Erosion control material shall be water-soluble, non-toxic, hydrophylic and shall not inhibit germination.

5.6 Soil Conditioners.

5.6.1 Rotted manure shall be well unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials and containing no chemicals or ingredients harmful to plants.

5.6.2 Topsoil shall be the existing surface soil amended by the application of ferrous sulphate at the rate of 200 lbs/acre, soil sulphur at the rate of 100 lbs/acre and the addition of manure as a soil conditioner at the rate of 1,500 lbs per acre.

6. INSTALLATION.

6.1 Tillage. After the areas required to be seeded have been brought to the grades as specified, they shall be thoroughly tilled to a depth of at least 8 inches by scarifying, disking, harrowing, or other approved methods. Ferrous sulphate, soil sulphur, and manure shall be incorporated into the soil to a depth of at least 8 inches and shall be incorporated as part of the tillage operation hereinbefore specified. On slopes between two horizontal to one vertical and one horizontal to one vertical, tillage depths shall be two inches. On slopes steeper than one horizontal to one vertical, no tillage will be permitted. Immediately before seeding, the soil shall be restored to an even condition. All weeds, rocks greater than one inch, and debris remaining on the surface after tillage shall be removed.

6.2 Planting shall not be done when the weather conditions or ground are in an unsatisfactory condition for planting. If special conditions exist that may warrant a variance in plant installation, a written request shall be submitted to the Contracting Officer stating the special conditions and proposed variance.

6.3 Seeding. The seed, mulch, and fertilizer shall be mixed in the required amount of water to produce a homogeneous slurry and then uniformly applied under pressure at the following rates (dry weight) per acre:

- 400 lbs. wood cellulose fiber mulch
- 218 lbs. 16-8-4 inorganic fertilizer
- 18.5 lbs. of seed mix
- 150 lbs. slow release fertilizer 16-6-8

6.4 Protection of Seeded Areas. Immediately after seeding, the area shall be covered at a rate of 1.75 tons/acre of clean wheat straw mulch through the use of a mulch blower. The mulch and netting shall be maintained until final acceptance. The seeded area shall be protected against traffic or other use by erecting barricades, as required, and placing approved signs at appropriate intervals until final acceptance.

6.4.1 Mulch Application. A second application of 1500 lbs/acre of wood cellulose fiber mulch mixed with 500 lbs/acre of water soluble erosion control material in the required amount of water to produce a homogeneous slurry, shall be applied immediately after the procedure described in paragraph: Protection of Seeded Areas.

6.5 Restoration and Clean-Up. Excess and waste material shall be removed daily. When hydroseeding in an area has been completed, the area shall be cleaned of all debris and excess material. Paving shall be cleaned when work in adjacent areas is completed.

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SECTION 3A

CONCRETE

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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 Concrete Institute (ACI) Standards.

318-83	Building Code Requirements for Reinforced Concrete
SP-66	ACI Detailing Manual - 1980

1.2 American Society for Testing and Materials (ASTM) Standard.

C 94-86a	Ready-Mixed Concrete
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1.3 U.S. Department of Commerce, National Bureau of Standards, Product Standards (Prod. Std.).

PS 1-83	Construction and Industrial Plywood
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2. GENERAL. The work shall be in conformance with ACI 318, part entitled "Construction Requirements", except as specified herein. Concrete shall conform to ASTM C 94.

3. STORAGE. Materials shall be stored so as not to deteriorate or become contaminated.

4. MATERIALS.

4.1 Anchorage Items. Anchorage items for anchoring work of other trades to concrete shall be of standard manufacture and of types to engage with anchors provided and installed under other sections.

4.2 Concrete Materials. Concrete materials shall conform to ASTM C 94, cement type optional. Only one brand of any one type of cement shall be used for exposed concrete surfaces of any individual structure.

4.3 Curing Materials. Curing materials shall be impervious sheet or membrane-forming curing compound. Impervious sheet shall be white opaque polyethylene 4 mil thick, waterproof kraft paper, or polyethylene-coated burlap.

4.4 Dowels. Dowels shall be plain carbon steel bars, minimum yield point of 40,000 psi for use in slabs on grade.

4.5 Form Coating. Form coating shall be nonstaining form oil or form release agent that will not deleteriously affect concrete surfaces nor impair subsequent applications.

4.6 Form Materials. Form materials shall be plywood or hardboard especially made for concrete form use or other materials that will produce the specified finishes without adversely affecting the concrete surfaces.

4.7 Form Ties. Form ties shall be metal, factory-fabricated removable or snap-off, that will leave holes not less than 1/4 inch nor more than one inch in diameter and not more than one inch deep. That portion of the tie remaining permanently in the concrete shall not project beyond the surface of the concrete and shall be recessed at least one inch from any concrete surface that will be exposed, painted, dampproofed, or will receive direct applications of plaster.

4.8 Reinforcement. Reinforcement bars shall be deformed, Grade 40 or Grade 60 billet or axle steel, or Grade 50 or Grade 60 rail steel.

5. CONCRETE QUALITY. Proportioning of concrete mixes to meet the requirements specified below shall be the Contractor's responsibility.

5.1 Compressive Strength. Compressive strength in 28 days shall be 3,000 psi for all concrete. The maximum water-cement ratio shall not exceed 0.55 by weight. The compressive strengths shall be reached in 7 days when high-early-strength cement is used.

5.2 Entrained-Air Content. Entrained-air content of exterior concrete shall be maintained at 5 to 7 percent by volume of concrete.

5.3 Slump. Slump shall be 3 to 4 inches.

6. FORMWORK. Formwork shall provide for concrete conforming accurately to the indicated shapes, lines, dimensions, and with surfaces free of offset, waviness, or bulges. Where surfaces are to be exposed or painted, panels shall be manufacturer's stock size material, using smaller panels cut to required dimensions only where required by openings and joints. Panel joints in exposed or painted work shall occur at control joints, including alinement with masonry control joints and construction joints. Exposed corners shall be chamfered, beveled, or rounded by moldings placed in the forms. Surfaces shall be thoroughly cleaned and coated before each use. Forms shall be removed at a time and in a manner that will not injure the concrete.

7. REINFORCEMENT. Reinforcement detailing and placement shall conform to ACI SP-66 and ACI 318. Reinforcement shall be interrupted 2 inches clear on each side of joints in slabs on grade and perimeter joints. Dowels and tie bars in slabs on grade shall be installed at right angles to joints; accurately alined parallel to the finished surface; and rigidly held in place and supported during concrete placement. One end of dowels shall be oiled or greased.

8. INSTALLATION OF ANCHORAGE ITEMS. Anchorage items shall be of number, size, and location to insure sufficient anchorage for purpose intended.

9. PLACING. Concrete footings and slabs shall be placed upon clean undisturbed surfaces free from water. Dry or pervious surfaces receiving concrete shall be covered with impervious sheet materials. Concrete may be placed directly on impervious surfaces that are thoroughly moistened but not muddy. Concrete shall be placed in layers not over 12 inches deep. Concrete to receive other construction shall be screeded to the proper level.

10. CONSOLIDATION OF CONCRETE. Consolidation of concrete shall be with internal concrete vibrators supplemented by handspading, rodding, and tamping. Vibrating equipment shall be adequate to thoroughly consolidate the concrete.

11. COLOR ADMIXTURE. Color admixture for concrete shall be the product of a manufacturer regularly engaged in the production of colored admixtures for concrete, and shall have a history of at least 2 years of use of the material in a similar environment without substantial fading or deleterious effects on the structural qualities of the concrete. Color admixture must be capable of evenly distributing the color throughout the concrete without segregation or causing irregular concentration of color. The color of all concrete exposed to view shall match the color of the concrete fence posts.

12. FINISHES OF CONCRETE. Fins and loose material shall be removed. Unsound concrete, voids over 1/2 inch in diameter, and tie-rod and bolt holes shall be cut back to solid concrete, reamed, brush-coated with cement grout, and filled solid with a stiff Portland-cement-sand mortar mix. Patchwork shall finish flush with adjoining concrete surfaces and where exposed, shall match adjoining surfaces in texture and color. Patchwork shall be cured for 72 hours. White Portland cement shall be used as needed to attain color match.

12.1 Smooth Finish. Surfaces to be painted or exposed to view except for concrete fence posts, shall be thoroughly wetted and then brush-coated with Portland-cement-sand grout of thick consistency and of mixture so that final color will approximately match the concrete. White Portland cement shall be used as needed to attain color match. Grout shall be cork- or wood-floated to fill voids, excess scraped off with a trowel, and visible grout film removed by rubbing with burlap. Grout shall be kept damp until set.

12.2 Class "A" Finish. The class of finish shall apply to the concrete posts used in the picket fence construction. The form facing material shall be composed of new, well-matched tongue-and-groove or shiplap lumber; new plywood panels conforming to NBS PS-1 grade B-B concrete form Class I; tempered concrete hardboard or steel. Steel lining on wood sheathing will not be allowed.

12.2.1 All bolts, wires, and rods shall be clipped and recessed. All holes, honeycomb, rock pockets and other surface imperfections shall be cleaned out, thoroughly moistened and carefully patched with mortar. Mortar shall be composed of 1 part cement and 2 parts fine sand. Additionally, the mortar shall be colored to match the color used in manufacture of the posts. The surface shall then be promptly covered with polyethylene film, wet burlap or cotton mats. If polyethylene film is used, the film shall be held securely to the surface by means of weights, adhesive, or other suitable means. Only white polyethylene film for covering will be acceptable.

12.2.2 When the mortar used in patching and pointing has set sufficiently, the surface shall be uncovered and thoroughly rubbed with either a float or a carborundum stone until the surface is covered with a lather. Cork, wood or

rubber floats shall be used only on a surfaces sufficiently green to work up such a lather, otherwise a carbonundum stone shall be used. During the rubbing process, a thin grout composed of 1 part cement and 1 part fine sand may be used to facilitate producing a satisfactory lather; however, this grout shall not be used in quantities sufficient to case a plaster coating to be left on the finished surface. The grout shall be colored as required to match the color of the surrounding concrete. Rubbing shall continue until irregularities are removed and there is no excess material. At the time a light dust appears, the surface shall be brushed or sacked. Brushing or sacking shall be carried in one direction so as to produce a uniform surface.

13. CURING shall start as soon as free water has disappeared from concrete surfaces after placing and finishing. Curing materials shall be applied and maintained so as to protect the concrete from moisture loss for 7 days. Curing shall be accomplished by impervious sheet or membrane-forming curing compound. Concrete surfaces shall be thoroughly wetted before covering with impervious-sheet materials. Membrane-forming curing compound shall be applied with mechanical spraying equipment at a coverage of not more than 300 square feet per gallon. Surfaces damaged during curing shall be resprayed.

14. WAYBILLS AND DELIVERY TICKETS. Copies of waybills or delivery tickets shall be attached to the Daily Contractor Quality Control Report for the day of delivery. Before the final statement is allowed, the Contractor shall file with the Contracting Officer waybills and/or certified delivery tickets for all concrete actually used in the construction covered by this contract.

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SECTION 5A

MISCELLANEOUS METALS

Index

1. Applicable Publications
2. Materials
3. Picket Fence

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 Specification (Fed. Spec.).

FF-B-575C	Bolts, Hexagon and Square
FF-N-836D & Am-1	Nut: Square, Hexagon, Cap, Slotted, Castle, Knurled, Welding and Single Ball Seat
FF-S-325 & Int Am-3	Shield, Expansion; Nail Expansion; and Nail, Drive Screw (Devises, Anchoring, Masonry)
QQ-B-750 & Am-2	Bronze, Phosphor; Bar, Plate, Rod, Sheet, Strip, Flat Wire, and Structural and Special Shaped Sections
QQ-S-763d & Notice 1	Steel Bars, Shapes, and Forgings, Corrosion-Resisting
WW-P-401E	Pipe Fittings: Bushings, Locknuts, and Plugs; Brass or Bronze, Iron or Steel, and Aluminum; (Screwed); 125-150-Pound
TT-E-489G	Enamel, Alkyd, Gloss (for Exterior and Interior Surfaces)
TT-E-1593B	Enamel, Silicone Alkyd Copolymer, Gloss (for Exterior and Interior Use)

1.2 American Society for Testing and Materials (ASTM) Standards.

A 36-81a	Structural Steel
A 53-83	Pipe, Steel, Black and Hot Dipped, Zinc Coated, Welded and Seamless
A 126-73 (R 1979)	Gray Iron Castings for Valves, Flanges and Pipe Fittings

A 320-83

Alloy-Steel Bolting Materials for
Low-Temperature Service

B 32-83

Solder Metal

1.3 Military Specification (Mil. Spec.).

Mil-C-18480A
Am-3

Coating Compound, Bituminous, Solvent,
Coal Tar Base

2. MATERIALS.

2.1 General. Materials indicated on the drawing or required in the work and not covered elsewhere by detailed requirements shall conform to the requirements of this section. In all cases not specifically covered in these specifications, the Contractor shall furnish approved highest grade commercial materials or products.

2.2 Structural Steel shall conform to ASTM A 36.

2.3 Corrosion-Resisting Steel Bolts and Anchor Bolts shall conform to Fed. Spec. QQ-S-763, Class 304, Condition A, or the applicable requirements of ASTM A 320, Grade B8. Nuts shall be galvanized.

2.4 Bronze shall conform to Federal Specification QQ-B-750, hard temper of either composition.

2.5 Bolts shall conform to Fed. Spec. FF-S-575.

2.6 Nuts shall conform to Fed. Spec. FF-N-836.

2.7 Cast Iron Pipe and Fittings shall conform to the applicable requirements of Fed. Spec. WW-P-401.

2.8 Steel tubing shall conform to ASTM A 500, Grade A for posts, and ASTM A 513 for picket rails.

2.9 Expansion bolts shall conform to Fed. Spec. FF-S-325.

3. PICKET FENCE.

3.1 Fabrication.

3.1.1 Picket Fence Panels. Pickets shall be steel tubing with caps welded at the top of the pickets. Fence panels shall be fabricated in the shop. Pickets, rails, and brackets shall be finished to provide smooth, straight edge free of burrs. All surfaces of the fence panels and brackets shall be cleaned in the shop to remove all rust, scale, dirt, and other foreign matter. "Tight" mill scale that cannot be lifted by applying a sharp knife to any edge will be permitted. The cleaning shall be accomplished by scraping, wire brushing, and wiping or other approved methods. The cleaning and painting operations shall be carried out in such a manner that the time between cleaning and the application of paint will not exceed 24 hours. Pickets, rails, and brackets shall be shop painted with 2 coats of black exterior oil paint conforming to Fed. Spec. TT-E-489, or TT-E-1593. Any

damage of the picket fence during transportation and/or installation will be cause for rejection of the fence panels. Any chipping of the original paint shall be repainted to the original color at the Contractor's cost.

3.1.2 Fence Posts. Any cracking of the fence posts during installation of fence panel brackets will be cause for rejection of the post, and the damaged post shall be replaced at no additional cost to the Government (the Contractor will not be permitted to repair damaged posts).

3.2 Installation.

3.2.1 General. Fence posts shall be installed plumb. Fence posts shall be installed to provide a straight and even alinement. Fence panels shall be installed level and in a straight alinement from one side of the post to the other. All bolts and nuts shall be tight. Expansion anchors shall be snug and shall not permit movement when tested by hand. Surfaces of galvanized metals that are abraded, cut, or welded during installation shall be neatly covered with grade 50B solder conforming to ASTM B 32.

3.2.2 Excavation for concrete-embedded items shall be of the dimensions indicated on the drawings. Holes shall be cleared of loose materials prior to placement of concrete.

3.2.3 After fence panels are fastened to the posts, the heads of anchoring bolts and any painted areas that are damaged during installation shall be painted with paint conforming the requirements for shop painting above. Paint shall be applied with a brush (spray methods shall not be used). Any such paint that gets on other than the surfaces specified to be painted shall be removed by the Contractor at no additional cost to the Government.

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SECTION 16A

ELECTRICAL WORK (FOR IRRIGATION SYSTEM)

Index

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|-------------------------------------|-----------------------------|
| 1. Controller to Control Valve Work | 7. Workmanship |
| 2. Applicable Publications | 8. Duct System |
| 3. General | 9. Secondary Junction Boxes |
| 4. Materials and Equipment | 10. Grounding |
| 5. List of Materials and Equipment | 11. Tests |
| 6. Shop Drawings | 12. Guarantee |

1. CONTROLLER TO CONTROL VALVE WORK. Electrical work from controller to control valves are specified in SECTION: IRRIGATION SYSTEM.

2. 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.

2.1 Federal Specifications (Fed. Spec.).

J-C-30A & Am-1	Cable and Wire, Electrical (Power, Fixed Installation)
W-C-586C	Conduit Outlet Boxes, Bodies and Entrance Caps, Electrical: Cast Metal
W-F-406B & Int. Am-1 (GSA-FSS)	Fittings for Cable, Power, Electrical and Conduit, Metal, Flexible
W-F-408C & Am-1	Fittings for Conduit, Metal Rigid, (Thick-Wall and Thin-Wall (EMT) Type)
W-P-115A & Am-3	Panel, Power Distribution
W-S-610C & Am-1	Splice Conductor
FF-P-101E & Am-2	Padlocks
HH-I-553C & Am-1	Insulation Tape, Electrical (Rubber, Natural and Synthetic)
HH-I-595C	Insulation Tape, Electrical, Pressure- Sensitive Adhesive, Plastic
SS-A-281b & Am-1	Aggregate; (For) Portland-Cement- Concrete

2.2 American Society for Testing and Materials (ASTM) Standards.

A 48-83	Grey Iron Castings
A 123-78	Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip
A 153-80	Zinc Coating (Hot Dip) on Iron and Steel Hardware
C 94-86a	Ready-Mixed Concrete
C 150-85	Portland Cement
D 69-85	Friction Tapes

2.3 National Electrical Manufacturers Association (NEMA) Standards.

No. SG 3-1975 Incl Rev 1	Low-Voltage Power Circuit Breakers
TC 2-1978 Incl Rev 1 thru 4	Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80)

2.4 National Fire Protection Association (NFPA) Publication.

No. 70-1981 (Vol. 6)	National Electrical Code
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2.5 Institute of Electrical and Electronics Engineers (IEEE) Standards.

National Electrical Safety Code (ANSI C2) (1981 Edition)

No. 142-1972	Recommended Practice for Grounding of Industrial and Commercial Power Systems
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2.6 Underwriters' Laboratories, Inc. (UL) Standards.

UL 6	Rigid Metal Conduit (Oct 23, 1981; 9th Ed.)
UL 467	Grounding and Bonding Equipment (Nov 7, 1972, 5th Ed.; Rev. thru 26 Mar 1982)
UL 651	Schedule 40 and 80 Rigid PVC Conduit (May 8, 1981; 4th Ed.)
UL 651A	Type EB and A Rigid PVC Conduit and HDPE Conduit (May 11, 1981; 1st Ed.)

3. GENERAL. The contract drawings indicate the extent and general arrangement of the underground electrical distribution systems.

3.1 Capacities for all equipment and materials shall be not less than those indicated.

3.2 Codes. The installation shall comply with the applicable requirements and recommendations of the National Electrical Code and the National Electrical Safety Code.

3.3 Conformance With Agency Requirements. Where materials or equipment are specified to conform to the standards of the Underwriters' Laboratories, Inc., or to be constructed or tested, or both, in accordance with the standards of the National Electrical Manufacturers Association or the American National Standards Institute, Inc., the Contractor shall submit proof that the items furnished under this section of the specifications conform to such requirements. The label of, or listing by the Underwriter's Laboratories, Inc., will be acceptable as sufficient evidence that the items conform to Underwriters' Laboratories, Inc., requirements. A certification or published catalog specification data statement to the effect that the item is in accordance with the referenced NEMA standard by a company listed as a member company of NEMA for the section whose standards cover the item under consideration, will be acceptable as sufficient evidence that the item conforms to the requirements of the National Electrical Manufacturers Association. In lieu of such stamp, certification, label or listing, the Contractor may submit a written certificate from any nationally recognized testing agency adequately equipped and competent to perform such services, stating that the items have been tested and that the units conform to the requirements listed hereinbefore, including methods of testing of the specified agencies. Conformance with the agency requirements does not relieve the item from complying with any other requirements of the specifications.

3.4 Nameplates. Each major component of equipment shall have as a minimum the manufacturer's name, address, and catalog number, model, style, or type on a plate securely and conspicuously attached to the item of equipment. Nameplates for electrical apparatus shall conform to the referenced standards.

3.5 Prevention of Corrosion. All metallic materials shall be protected against corrosion. Exposed metallic parts of outdoor apparatus shall be given a rust-inhibiting treatment and standard finish by the manufacturer. Aluminum shall not be used in contact with the earth, and where connected to dissimilar metal shall be protected by approved fittings and treatment. All parts such as boxes, bodies, fittings, guards, and miscellaneous parts made of ferrous metals but not of corrosion-resistant steel, shall be zinc-coated in accordance with ASTM A 123, or A 153, except where other equivalent protective treatment is specifically approved in writing by the Contracting Officer. Steel conduits installed underground or under slabs on grade shall be coated with an approved asphaltic paint, plastic coating or shall be wrapped with a single layer of a pressure-sensitive plastic tape, half-lapped. Where pressure-sensitive plastic tape is used, the conduit shall be coated with a primer recommended by the tape manufacturer before applying the tape.

3.6 Spare-Parts Data. As soon as practicable after approval of materials and equipment and, if possible, not later than one month prior to the date of beneficial use, the Contractor shall furnish spare-parts data for each different

item of equipment listed. The data shall include a complete list of parts and supplies, with current unit prices and source of supply; a list of parts and supplies that are either normally furnished at no extra cost with the purchase of the equipment, or specified hereinafter to be furnished as part of the contract; and a list of additional items recommended by the manufacturer to assure efficient operation for a period of 120 days at the particular installation. The foregoing shall not relieve the Contractor of any responsibilities under the guarantee specified hereinafter.

3.7 Standard Products. Materials and equipment shall be essentially the standard products of a manufacturer regularly engaged in the manufacture of the product, shall meet the requirements of the specification, and essentially duplicate materials and equipment that have been in satisfactory use at least 2 years.

3.8 Verification of Dimensions. The Contractor shall be specifically responsible for the coordination and proper relation of this work to the site and to the work of all trades. The Contractor shall visit the premises and thoroughly familiarize himself with all details of the work and working conditions, shall verify all dimensions in the field, and advise the Contracting Officer of any discrepancy before performing any work.

4. MATERIALS AND EQUIPMENT shall conform to the respective specifications and other requirements specified herein.

4.1 Cable shall have copper conductors unless otherwise indicated.

4.1.1 Conductors, Insulated. Fed. Spec. J-C-30, types as indicated.

4.2 Conduit, Steel. UL 6.

4.3 Plastic Conduit shall be single bore, and shall be polyvinyl-chloride (UL 651), conduit for underground use without concrete encasement or polyvinyl-chloride tubing (UL 651A, Type A PVC) for underground use with concrete encasement conforming to NEMA TC 2 and applicable UL. Conduit fittings shall conform to the applicable NEMA standards, except that where NEMA standards for conduit fittings do not exist for the type of plastic installed, fittings shall be as recommended by the conduit manufacturer. Conduit and fittings shall be free, within commercial tolerances, of objectionable lines, striations, bubbles, welds, and other manufacturing defects that would impair the service of the conduit. The bore of the conduit shall be straight and circular in cross section with smooth interior surfaces free from obstructions and rough and flaky areas. The conduit and fittings shall be free from all substances that injuriously affect any wire or cable covering such as is used on rubber-covered wire, polychloroprene-sheathed cable, weatherproof wire, and lead- or lead-alloy-covered cable. The conduit and fittings shall be corrosion-resistant and not adversely affected by chewing insects, gnawing rodents, acids, alkalies, salts, bacteria, and other organic matter that would normally be encountered in the ground. The conduit length for each size shall be the length that is standard with the manufacturer with a permissible tolerance of 1/4 inch per 10-foot length. Bends, elbows, and other fittings shall be capable of freely passing a ball that is 1/4 inch less in diameter than the nominal bore of the conduit. Fittings shall be of a type especially made for use with plastic conduits for electrical service. Conduit and fittings shall be capable of being joined, by means of a solvent welding cement, so as to provide a watertight and rootproof joint. Electrical plastic tubing,

EPT-PVC, for use with concrete encasement, and electrical plastic conduit, EPC-40-PE or EPC-40-PVC for use without concrete encasement shall have dimensions for the corresponding size in accordance with Table 2-1 of NEMA TC-2. Sections cut from the conduit shall be calipered for wall thickness.

4.4 Connectors. Fed. Spec. W-S-610.

4.5 Fittings, cable and conduit. Fed. Spec. W-F-406 or W-F-408. Insulating material in bushing shall be of the thermosetting type and shall not support combustion.

4.6 Mortar shall be composed of the following materials.

4.6.1 Aggregate. Fed. Spec. SS-A-281.

4.6.2 Portland Cement. ASTM Standard C 150.

4.6.3 Water shall be clean, fresh, and free from injurious amounts of mineral and organic substances.

4.6.4 Mixture shall be in the proportions of one part Portland cement to one part sand with sufficient water added to produce a pliable and workable mortar.

4.7 Outlets, metal, for conduit. Fed. Spec. W-C-586.

4.8 Padlocks. Fed. Spec. FF-P-101.

4.9 Paint. As specified.

4.10 Panelboards. Fed. Spec. W-P-115, type and class as indicated. Panelboards installed exposed to the weather shall be raintight except as otherwise indicated.

4.11 Service Entrance Equipment shall be UL listed, and approved for use by the Arizona Public Service. Equipment outdoors shall be in NEMA 3R enclosures.

4.12 Tape.

4.12.1 Friction Tape. ASTM D 69.

4.12.2 Plastic Tape. Fed. Spec. HH-I-595.

4.12.3 Rubber Tape. Fed. Spec. HH-I-553.

4.13 Circuit Breakers.

4.13.1 Low-voltage power circuit breakers. NEMA SG 3.

4.13.2 Molded-case circuit breakers. Fed. Spec. W-C-375.

4.14 Grounding and Bonding. UL 467.

4.15 Concrete shall conform to the applicable requirements of ASTM C 94.

5. LIST OF MATERIALS AND EQUIPMENT. Before starting installation of any materials or equipment the Contractor shall submit to the Contracting Officer for approval a complete list, in accordance with the SPECIAL CLAUSES, of materials and equipment to be incorporated in the work. This list shall include manufacturer's style or catalog numbers. Cuts or other descriptive data shall be furnished when required by the Contracting Officer. No consideration will be given to partial lists submitted from time to time. Approval of materials will be based on manufacturer's published data, approval of materials and equipment will be tentative subject to submission of complete shop drawings indicating compliance with the contract documents.

6. SHOP DRAWINGS. After receiving tentative approval of the equipment on the material lists and before installation of any of these items, the Contractor shall submit complete shop drawings and such other descriptive data as the Contracting Officer may require to demonstrate compliance with the contract documents. Shop drawings shall be submitted for the following item and such other items as the Contracting Officer may direct.

a. Meter Pedestal.

If departures from the contract drawings are deemed necessary by the Contractor, details of such departures, including changes in related portions of the project and the reasons therefore, shall be submitted with the shop drawings. Approved departures shall be made at no additional cost to the Government.

7. WORKMANSHIP.

7.1 General. All materials and equipment shall be installed in accordance with the recommendations of the manufacturer as approved by the Contracting Officer to conform with the contract documents. The installation shall be accomplished by workmen skilled in this type of work.

8. DUCT SYSTEM.

8.1 General. The duct system shall consist of single round-bore conduit. The number and size of the duct shall be as indicated. Duct lines shall be laid to a minimum grade of 4 inches per 200 feet. Pullboxes shall be located at every 200 lineal feet or every 90 degree change in direction. Grade may be from one pullbox to the next or both ways from high point between pullboxes, depending on the contour of the finished grade. Duct lines shall be installed so that the top of concrete in encased duct lines is not less than 18 inches below, or duct in non-encased duct lines is not less than 24 inches below finished grade or finished paving at any point. Changes in direction of runs exceeding the total of 10 degrees, either vertical or horizontal, shall be accomplished by long sweep bends having a minimum radius of curvature of 25 feet, except that manufactured bends may be used at the ends of the run. The long sweep bends may be made up of one or more curved or straight sections and/or combinations thereof. Manufactured bends shall have a minimum radius of 18 inches for use with ducts of less than 3 inches in diameter and a minimum radius of 36 inches for ducts of 3 inches in diameter and larger. Conduits shall terminate in water proof end bells where duct lines enter pullboxes. Conduit shall be thoroughly cleaned before using or laying. During construction and after the duct line is completed, the end of the conduits shall be plugged to prevent water washing mud into the conduits or pullboxes. Particular care shall be taken to keep the conduit clean of concrete,

dirt, and any other substance during the course of construction. Where it is necessary to cut a tapered end on a piece of conduit at the site, the cut shall be made with a tool or lathe designed to cut a taper to match the taper to the particular conduit being used. After the duct line has been completed, a standard flexible mandrel not less than 12 inches long, having a diameter approximately 1/4 inches less than the inside diameter of the conduit, shall be pulled through each conduit, after which a brush with stiff bristles shall be pulled through each conduit to make certain that no particles of earth, sand, or gravel, have been left in the line. Pneumatic rodding may be used to draw in the lead wire. Where connection is made to an existing duct that is of different material and shape than the duct line being installed, a suitable coupling of a type recommended by the duct manufacturer shall be used. Conduits shall be stored to avoid warping or deterioration. Conduit joints in concrete encasement may be placed side by side horizontally but shall be staggered at least 6 inches vertically.

8.2 Materials.

8.2.1 Ducts for Secondary Electrical, Feeders and Branch Circuit Conductors shall be rigid steel or plastic conduits without concrete encasement, except conduits shall be concrete encased under all roads, and paved or traffic areas.

8.3 Installation of Ducts.

8.3.1 Conduits. Conduits shall be buried directly in the earth, except as specified hereinbefore. The width of the trench shall be approximately the width of the conduit plus 6 inches, with depth of cover over the top of the conduit not less than 24 inches. The bottom of the trench shall be graded toward pullboxes, and shall be smooth and free of stones, soft spots, and sharp objects. Where bottom of trench comprise materials other than sand or stone-free earth, a 3-inch layer of sand, or stone-free earth shall be laid on the bottom of the trench and compacted to the approximate density of the surrounding firm soil before installing the conduits. The first layer of backfill cover shall be sand or stone-free earth, compacted as specified. Conduits may be held in alinement with a few shovelfuls of dirt. The selected earth at the sides of the conduit shall be thoroughly tamped in 4- to 6-inch layers. Backfill and compaction in trenches shall conform to the requirements of paragraph: BACKFILLING of SECTION: IRRIGATION SYSTEM.

8.4 Installation of Couplings.

8.4.1 General. Joints in all types of conduit shall be made up in accordance with the manufacturer's recommendations for the particular conduit and coupling selected and as approved by the Contracting Officer. In the absence of specific recommendations, the various types of conduit joint couplings shall be made watertight by the following method.

8.4.1.1 Plastic Conduit Joints shall be made up by brushing a plastic solvent cement on the inside of the plastic coupling fitting and on the outside of the conduit ends. The conduit and fitting shall then be slipped together, until seated, with a slight twist to set the joint tightly, and the conduit then rotated one-half turn to distribute the cement evenly. Excess cement built up on the inside surface of the conduit shall then be removed.

8.5 Concrete shall be 3,000 psi at 28 days. Duct lines shall be of monolithic construction. Where a connection is made to an existing duct line, the concrete encasement shall be well bonded or doweled to the existing encasement.

9. SECONDARY JUNCTION BOXES shall be installed where indicated, for the purpose of splicing or connecting secondary cables. Boxes and covers shall be made of cast iron with zinc-coated or aluminized finish, and of the sizes indicated. A suitable gasket shall be installed between the box and cover, for watertightness. A sufficient number of cover screws shall be installed to hold the cover firmly in place along its entire contact surface. Unless otherwise indicated, the approximate inside dimensions of these boxes shall be 12 inches square and 6 inches deep.

10. GROUNDING.

10.1 General. Grounding shall conform to applicable requirements in the National Electrical Code, the National Electrical Safety Code, and to requirements herein. Neutral conductors, cable shields, metallic cable sheaths, metallic conduits, pothead bodies, junction boxes, and all non-current-carrying metallic parts of equipment, shall be grounded. Ground rods except those installed in pullboxes shall be made of copper, or copper-clad steel, not less than 3/4 inch by 10 feet long, and shall be driven into the earth at least 10 feet unless otherwise indicated.

10.2 Meter Pedestal. Each meter pedestal shall have one ground rod. A bare copper cable not smaller than No. 8 AWG shall be connected to the ground rod. Connection to the ground rod shall be by means of approved fusion-weld process.

11. TESTS.

11.1 Operating Test. After the installation has been completed, and at such time as the Contracting Officer may direct, the Contractor shall conduct an operating test for approval. The equipment shall be demonstrated to operate in accordance with the requirements of this section of the specifications. The tests shall be performed in the presence of the Contracting Officer. The Contractor shall furnish the necessary instruments and personnel required for the test.

11.2 Ground Resistance Measurements. Ground resistance shall be measured in accordance with and shall meet the requirements of the National Electric Code.

11.3 The maximum resistance measured in accordance with IEEE No. 142 of a driven ground shall not exceed 25 ohms under normally dry conditions. If this resistance cannot be obtained with a single rod, 2 additional rods not less than 6 feet on centers, or if sectional type rods are used, 4 additional sections may be coupled and driven with the first rod. If the resultant resistance exceeds 25 ohms measured not less than 48 hours after rainfall, the Contracting Officer shall be notified immediately.

11.4 Factory Test Reports on equipment, including the impulse tests specified for transformers, shall be certified by the manufacturer or testing laboratory and furnished by the Contractor to the Contracting Officer.

12. GUARANTEE. The following equipment furnished under this section of the specifications shall be guaranteed for a period of one year from the date of acceptance thereof, either for beneficial use or final acceptance, whichever is earlier, against defective materials, design, and workmanship.

Meter Pedestals

Upon receipt of notice from the Government of failure of any part of the guaranteed equipment during the guarantee period, new replacement parts shall be furnished and installed promptly by the Contractor at no additional cost to the Government.

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